

A Guide to Integrated Rural Accessibility Planning in Malawi

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on behalf of the International Labour Organisation

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Foreword

The Malawi Government recognises that it can achieve its development goals by utilising one of the most important resources - its people. This can best be done when people participate in development activities and are able to realise their full potential. In this regard, a new policy of Decentralisation has been adopted. People will take a leading role in the planning and management of development projects that reflect their felt needs and priorities in the bid to alleviate poverty. The Decentralisation Policy also seeks to ensure that the majority of the people of this country are able to meaningfully participate in the local development process. Therefore, the availability of simple and easy to use planning tools is essential.

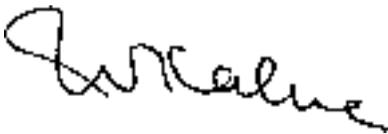
Malawi has through the Pilot Integrated Rural Transport Project, which operated in three pilot areas of Neno in Mwanza District, Lobi in Dedza District and Embangweni in Mzimba District, developed a local level planning tool known as Integrated Rural Accessibility Planning (IRAP). This tool was further tested district wide in Dedza District and it has proved to be an asset in generating data for identifying needs/problems and coming up with appropriate development interventions. It is out of the experiences in the pilot project and Dedza District as a whole that this guide has been prepared.

Integrated Rural Accessibility Planning (IRAP) is a tool for defining the access needs of rural households in relation to the basic social and economic services that households require. It is a tool that facilitates the development of comprehensive information on the location, condition and use of rural infrastructure and services, priorities, investments and identifies access interventions. IRAP further emphasises the building of local capacity and the use of local resources (material and human) in the implementation and maintenance of locally initiated projects, including the adoption of appropriate technologies and use of labour

intensive methodologies. By using IRAP, communities will be able to come up with a set well defined and prioritised interventions that address the access needs of the rural population as done in the three pilot areas and Dedza District as a whole.

The guide has been developed for use by local development institutions such as District Development Committees, District Executive Committees, Area Development Committees, Village Development Committees, Non-Governmental Organisations and other private sector local level institutions. Integrated Rural Accessibility Planning is not designed to replace any other local level planning system but rather to augment and enrich existing ones such as the District Planning System (DPS).

It is, therefore, my fervent belief that Policy makers, Planners, Engineers, Extension workers, Development Institutions and NGOs at local level will recognise and appreciate the rationale in the adoption and application of the tool in their local level development endeavours.



JAMES KALILANGWE
SECRETARY FOR DISTRICT AND
LOCAL GOVERNMENT ADMINISTRATION

March, 1999

Abbreviations and Acronyms

ADC	: Area Development Committee
AEC	: Area Executive Committee
Als	: Accessibility Indicators
APO	: Area Planning Officer
DDC	: District Development Council
DDO	: District Development Officer
DEC	: District Executive Committee
DHRDO	: District Human Resources Development Officer
DPS	: District Planning System
DTC	: District Technical Committee
EU	: European Union
FHH	: Female Headed Household
HC	: Health Centre
HH	: No. of Households
ILO	: International Labour Organisation
IMTs	: Intermediate Means of Transport
IRAP	: Integrated Rural Accessibility Planning
MASAF	: Malawi Social Action Fund
MOT	: Means of Transport
NGOs	: Non-Governmental Organisations
NSO	: National Statistical Office
PIRTP	: Pilot Integrated Rural Transport Project
PWSP	: Protected Water Supply Point
SPSS	: A Computer Software Programme for Statistical Analysis

TT	: Transport or Travel Time
TA	: Traditional Authority
UNDP	: United Nations Development Programme
VDC	: Village Development Committees
WP	: Water Point

Executive Summary

Integrated Rural Accessibility Planning (IRAP) is a multi-sectoral, integrated planning tool that addresses the major aspects of access needs of rural households for subsistence, social and economic purposes. IRAP integrates the access and mobility needs of the rural population, the locations of basic social-economic services and the transport infrastructure in all sectors.

IRAP is participatory and pro-active: it involves communities in all stages of the planning and creates a platform for local level planners and beneficiaries to pro-actively plan for development.

IRAP consists of a number of activities starting from Data Collection to Monitoring and Evaluation:

Data collection (step 1) is the first exercise. Enumerators hold interviews with key-informants of target villages in the district, using a questionnaire that contains questions on accessibility in all sectors, like drinking water, agricultural marketing, health, education, etc. It collects data on the existing transport, travel and access problems and prioritises possible interventions for improvement.

Data Processing (step2) involves data encoding and processing into a computerised database.

Data Analysis (step 3) of the encoded data will lead to specific information on access in all sectors. The information can be grouped for different administrative levels. Tables and graphs help the users to interpret the results.

Mapping (step 4) assists visualisation of the accessibility situation. Combining maps and overlays of different sectors will help to identify the best possible solutions to achieve integrated and cost effective access interventions.

Validation workshops (step 5) are held to verify the data analysis output and to formulate and discuss the access problems and priorities and to identify interventions with the representatives of the Village Development Committees (VDCs).

Compilation of Access Profiles (step 6) is done following collection of the access information after verification in the workshops.

The combinations of the output from the analysis and the maps form a profile of the accessibility of an area. An Area Accessibility Profile will include ranked villages and VDCs for each sector. The Profile furthermore provides descriptive information on facilities and services.

The most urgent accessibility problems, as perceived by the people themselves, are listed. Preliminary solutions suggested by the villagers are also mentioned. The “objective” numerical (access) ranking is compared to the more “subjective”, perceived problems and proposed interventions.

Setting Accessibility Targets (step 7) is the next step in the process. Having identified accessibility problems in each sector and cross sectorally, realistic targets and objectives at local level are defined.

Prioritisation and Formulation of Interventions (step 8) is the next logical step in addressing accessibility needs at both area and district level. The district authorities can pro-actively formulate proposals or alternatives to village proposals that go beyond the scope of individual villages or VDCs. It is now possible to relate this assessment to district and sector targets.

Implementation (step 9) is the stage in which the proposed interventions (projects), identified in the Prioritisation Process, are included in the overall district development projects and ready for implementation. IRAP in Malawi is introduced as a tool that can enhance and complement the District Development Planning System. Integration of the IRAP contributes to having a participatory method to assess the needs of the rural population. Planning becomes more effective and efficient.

Monitoring and Evaluation (step 10) is the final step in the IRAP cycle. Feedback is required to improve the effectiveness of all steps in IRAP and the results of interventions have to be assessed against the defined targets and objectives and the intended outcomes.

Chapter 1

Introduction

1.1 Rural transport and Accessibility

In this chapter, it is important to briefly explain what rural accessibility is and why it should be considered in local level planning.

Since independence the transport sector has consistently been one of the priority areas in development planning, accounting for up to 30 per cent of public sector development. The greater part of the expenditure was on physical infrastructure, especially the network of highways and district roads, railways and airports. As a result most motor vehicle transport services concentrate in and around major urban centres and on long distance main routes.

Traditionally rural transport has been based on roads. It was assumed that improved infrastructure would enhance movement, boost public transport, production and consumption. The conventional approach has contributed to the general social and economic development of the country. However it has not helped the majority of the rural people.

There is a growing recognition that conventional approaches to rural transport, with emphasis on motorised transport and roads, do not address the transport needs of the rural population.

Rural Transport is not only related to the means of travel but also specifically refers to the availability and location of basic services, perhaps a better term to define Rural Transport is *Accessibility*. To understand *Accessibility* in the context of Rural Development it is important to define the terms *Mobility* and *Accessibility*:

Mobility (being mobile) is defined as the ease or the difficulty with which people and goods move from one point to another (the origin and destination). Mobility is associated with the transport infrastructures as well as the means of travel and transport.

Accessibility is defined as the ease or difficulty of reaching or using a facility or service. It relates to the availability of a service or its location as well as the mobility aspects.

Rural Transport and Accessibility examines the transport needs, the way people travel and what goods are transported, who carries the burden of transport, where it is carried to and what can be done to improve access for the rural population. Interventions do not only focus on improvement of the physical infrastructure, by construction and improvement of roads, footpaths and bridges, but also on “means of transport”, “location planning” and “quality improvement of services”.

Studies in Malawi and other countries have shown that (see Fig 1):

- ❖ Walking and head loading is the predominant means of transport as opposed to transport by (motorised) vehicles.
- ❖ The majority of transport and activities, taking about 80 % of time and effort, takes place inside and around the villages, using footpaths and tracks.
- ❖ The predominant reason for transport, in terms of time spent, is to fulfil subsistence needs.
- ❖ The location of some basic social and economic services, e.g. water supply, firewood stocks, markets, health clinics, grinding mills, is not always convenient, making travel long and tiresome.
- ❖ The burden of travel and transport predominately (over 80 %) falls on women.

People in rural Malawi have limited access to mechanical transport, inadequate community roads, poor and unsafe footpaths, tracks and foot bridges. This leads to serious difficulties in reaching markets, agricultural inputs, and production fields. There are also problems reaching available social services and facilities, and employment opportunities. This is reflected in time spent accessing these facilities and services.

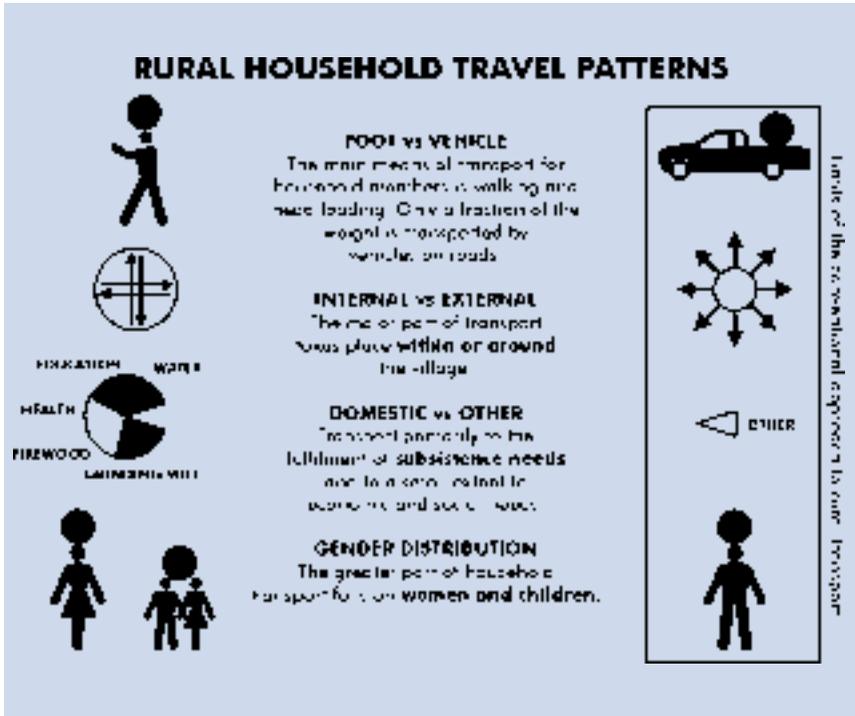


Figure 1: Travel & Transport Pattern

There is considerable evidence to suggest that lack of access is a major factor impeding the integration of the rural population into the national economy. It restricts the pace of innovation and limits the potential for growth in production and income. Thus, isolation contributes to poverty.

A combination of interventions often gives the best result. For example, improve paths and tracks *and* provide credit for the purchase of intermediate means of transport, like bicycles and oxcarts. Facilities such as boreholes, grinding mills or health centres are not always conveniently located or the spatial distribution does not match the number of households using the facility. In that case construction of new service points can be a useful intervention, but often upgrading of the service or improving the infrastructure can improve the accessibility remarkably.

Already mentioned in this Introduction is that the major part of household travel relates to basic services and subsistence needs. In figure 2 below the major sectors of rural household travel are visualised:



Figure 2: Main Sectors in Rural Travel and Transport

Rural travel and transport is not necessarily limited to these sectors; other important sectors to be considered are irrigation, post harvesting facilities, etc.

1.2 Gender issues

Studies in Malawi and Tanzania showed that women contributed about three times more time to rural transport than men. When looking at the loads transported, the ratio between men and women becomes even

more uneven; only about 15% is carried by men. As headloading accounts for approximately 80 % in the way goods are carried, it becomes clear why women carry the burden; traditionally headloading is women's work, not for men.

Another factor that contributes to the unequal distribution in transportation is that the majority of the trips are made to fulfil subsistence and social needs (collecting firewood, water, health care for the children, etc.). Again tradition and culture mean that these tasks are the responsibility of women.

Improving accessibility in the rural areas is beneficial to all people, but will have particular impact on women. It is therefore essential that women are involved in all phases of rural transport and access planning, planning implementation and maintenance.

Gender issues to be considered are:

- ❖ How is the 'labour' at household level divided: who is responsible for what?
- ❖ What are the differences between men and women in access to services, credit, land, extension, etc.?
- ❖ What is the decision making power of women in the village?
- ❖ What are the effects of social, cultural and legal rules and regulations on the rights of women as opposed to men with regard to empowerment and self-development?

1.3 The Objectives of the Guidelines

In a dynamic Malawi, with transitions from central level governance towards local level empowerment, structure in local level planning is essential. The Government of Malawi is keen to develop this. Accessibility planning will be an important contribution and thus a guideline on IRAP is timely.

This Guideline will therefore:

- ❖ Support and complement the District Development Planning Manual.

- ❖ Provide workable guidance for district level planning with emphasis on Accessibility.
- ❖ Strengthen the capacity of district- and ADC planning officers in doing pro-active planning.
- ❖ Provide the basis for further training manuals.

1.4 The Users of the Guidelines

Because Accessibility Planning is introduced as a Tool that enhances and complements the District Planning System, the main users are the same as envisaged in the District Development Planning Manual:

- ❖ District Institutions
 - District Development Committees (DDC)
 - District Executive Committees (DEC)
 - Area Development Committees (ADC)
 - Area Executive Committees (AEC)
 - Village Development Committees (VDC)
- ❖ Non-Governmental Organisations (NGOs)
- ❖ The Ministry of Economic Planning and Development

The District Executive Committee is the co-ordinating point.

1.5 Outline of the Guidelines

Having discussed the importance of Access in relation to Rural Development, the next chapter will briefly explain what Integrated Rural Accessibility Planning is and what steps are involved. After this description of the process in outline, the succeeding chapters will discuss each step in detail; Chapter 3 to 10 discuss the process from Data Collection to Monitoring and Evaluation. Then finally in Chapter 11 the integration of IRAP into the District Planning System is considered.

Chapter 2

Integrated Rural Accessibility Planning

2.1 The Planning Tool

Integrated Rural Accessibility Planning seeks to address Access needs of the rural people in a cost effective manner with the purpose of improving access to socio-economic services. The intention is to reduce poverty and hence contribute positively to the country's overall social and economic well-being.

Within the Local Governance and Development Management Programme setting, communities propose projects (interventions) which are assessed by the Area Executive Committee (AEC) and then forwarded to the District Executive Committee (DEC) for appraisal before they are submitted to the DDC for approval.

The Accessibility Planning tool can be used to complement the District Planning Framework. Accessibility information provides a solid base on which the DEC can assess proposals from the communities effectively. Furthermore IRAP is a tool to actively set priorities and make suggestions for interventions; for example, spatial planning of facilities and services.

IRAP is a pro-active planning tool that enables the planner to take objective decisions based on data collected at Village and District level.

The process is participatory because it takes into account the views and opinions of villagers. It is objective in the sense that the planning is based on primary data collected in villages of the district and it allows comparison between villages, VDCs and ADCs by looking at the Access situation of the rural people and the Access Indicators per sector¹.

Summarising, the following statements on IRAP can be made:

- ❖ IRAP is integrated and multi-sectoral; it looks at all sectors, as well as the people and the system in which transport and travel exist.
- ❖ IRAP is a tool that provides practical assistance in planning.
- ❖ IRAP can be applied at village, area and district level.
- ❖ IRAP is based on primary data collection and participatory consensus building.

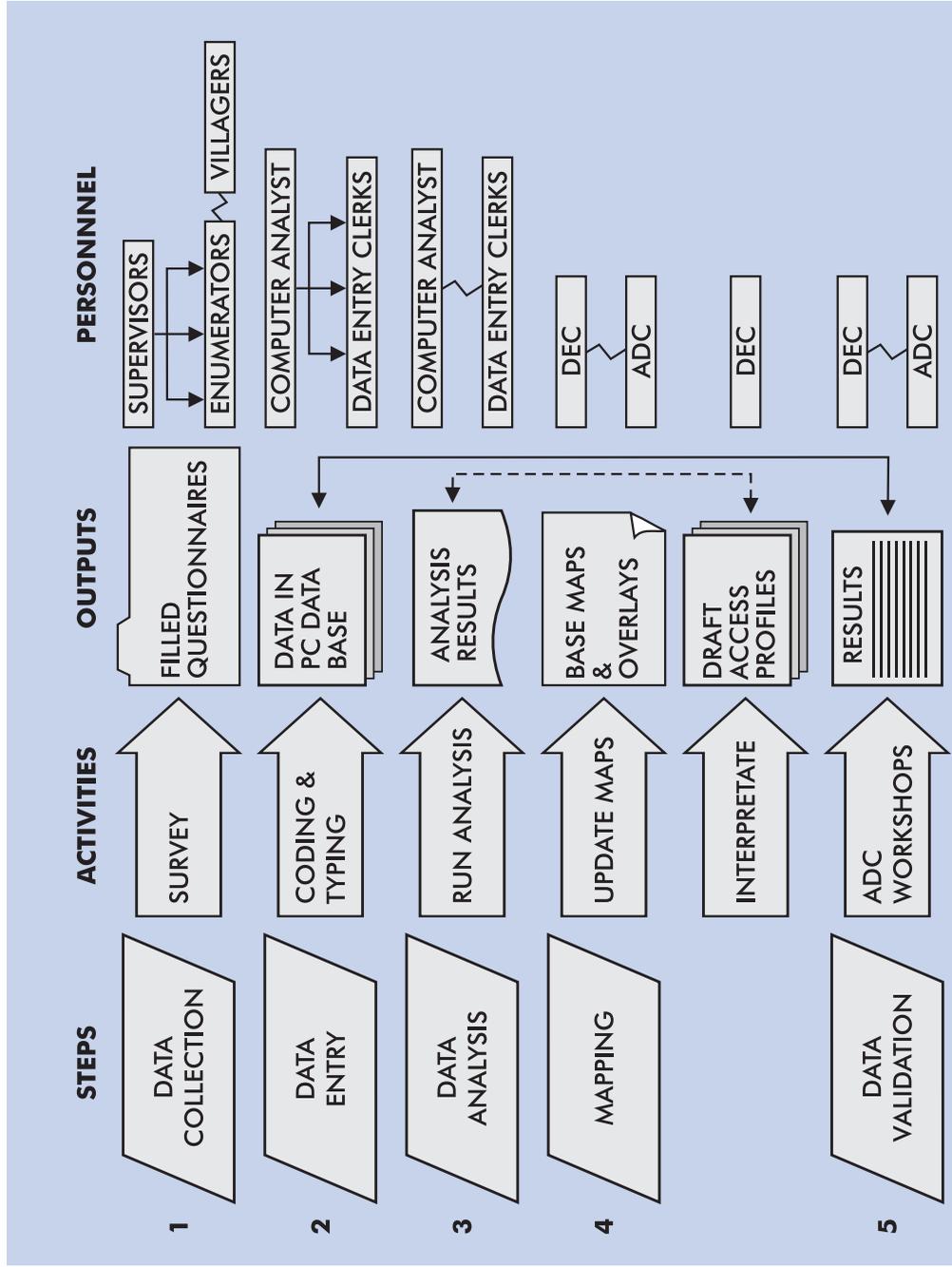
2.2 The Steps in IRAP

There are several chronological activities, or “Steps” involved in Integrated Rural Accessibility Planning. These relate to data collection, data processing, needs/problem analysis and priority setting.

The next page presents a diagram, visualising the steps in IRAP. The following chapters will discuss the steps in more detail.

Footnote

¹ *Drinking water, Health, Education, etc*



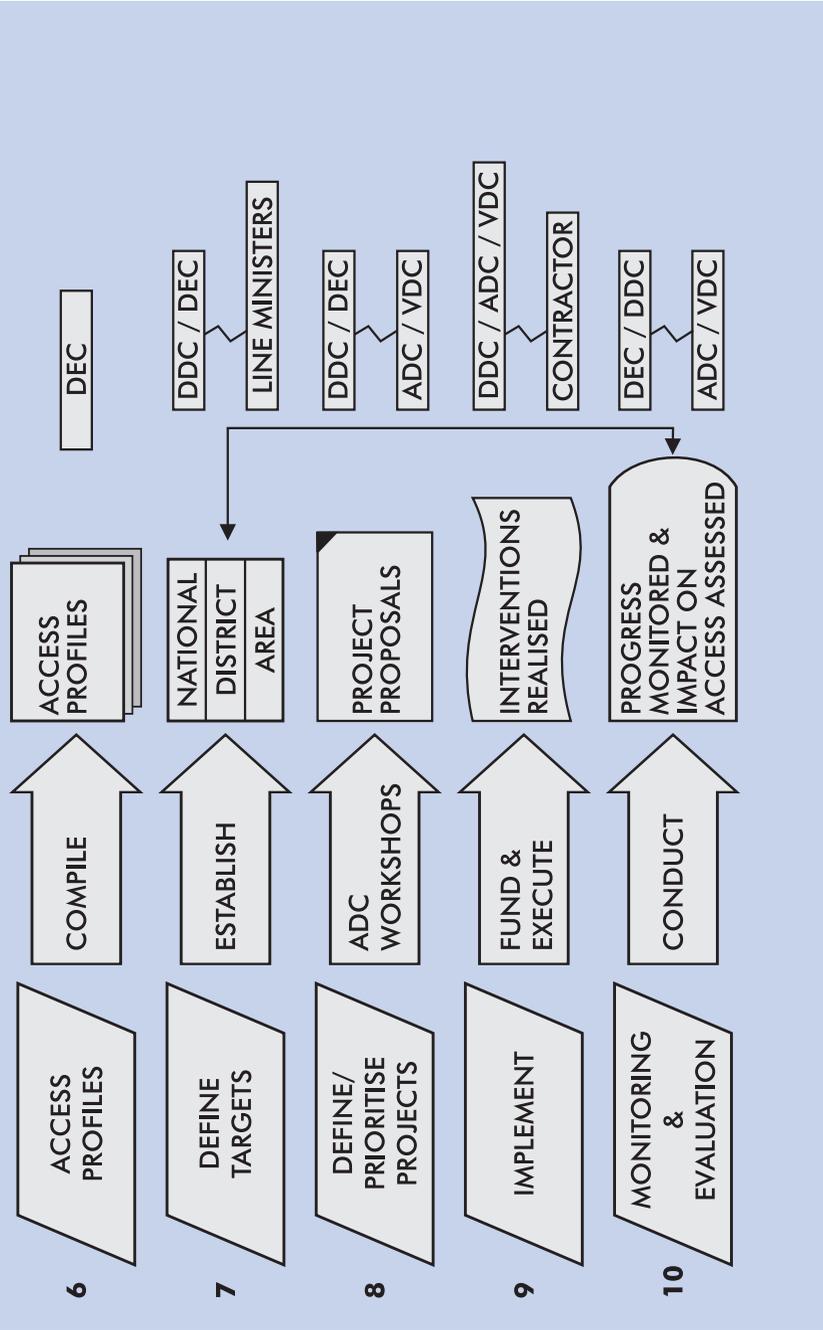


Figure 3: The Steps in IRAP

Chapter 3

Data Collection

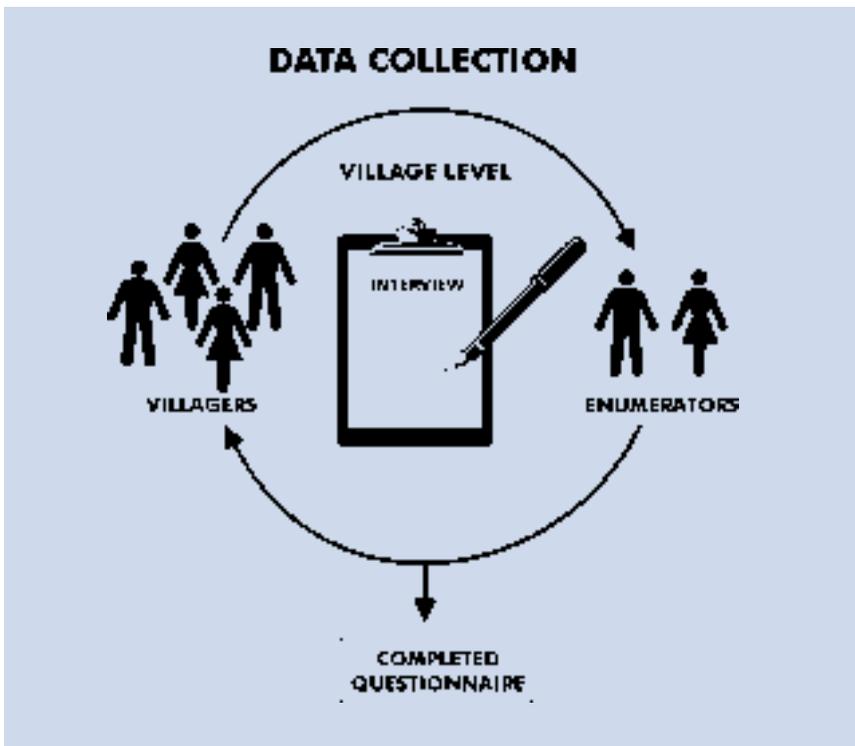


Figure 4: Data Collection Diagram

3.1 Objective and Outline

The basis for the decision making process is the data collection exercise. A baseline survey will be conducted in villages of the district.

The purpose of this activity is to accumulate reliable information on accessibility in all relevant sectors. The collected data builds the foundation for the accessibility planning procedure.

Enumeration (quantifying) is by local people and AEC members. Supervision is by District Executive Committee (DEC) members. The information is collected in a meeting with key informants, representatives from affected settlements, using village questionnaires.

The questions relate to:

- ❖ Travel / transport time of an average household of the village.
- ❖ Existing physical infrastructure
- ❖ Availability and quality of services
- ❖ Transport services and means of transport
- ❖ Gender differentiation/discrimination in travel and transport
- ❖ An Accessibility problem inventory

The outcome of the data collection exercise is a village fact sheet on Accessibility, indicating the accessibility problems that exist, in which sectors and how these could be solved.

Compilation of data collected at village level will give the overall picture at Area and District level. This primary data should be complemented by secondary data from district level, and include:

- ❖ Population distribution and density of villages.
- ❖ Transport operators, availability and condition of the road network.
- ❖ Economic activities: private businesses and enterprises, types and quantity of employment.
- ❖ Information on facilities: indicators for the health sector, for example, number of beds, number of medical personnel, condition of buildings, pupil/teacher ratio in schools. In the District Planning Framework these indicators are listed per sector.
- ❖ NGOs operating in the district in fields related to Accessibility.
- ❖ Qualitative and quantitative information related to facilities: e.g. enrolment/drop-out rate and reasons; level and professional ability

of teachers; appropriateness of teaching materials; or figures on most common diseases; medical stock per health centre; hygienic condition of facilities, etc.

In the District Planning Framework these indicators are listed per sector under *Social Indicators*.

❖ Sectoral and cross sectoral targets

All information collected at Village level is called *primary data*. This village data is then used to compile VDC, ADC and District average figures.

Data is collected in villages of the district to enable prioritisation of villages in each sector. The planner is then able to reach the best and most cost effective solutions to improve the access situation for those villages, VDCs and ADCs. Another good reason for collecting data from each village is because this is where planning starts: the villagers initiate proposals for interventions. It is only possible to verify and assess proposals if primary data is obtained from the same level.

The tool for collecting the information is a village questionnaire.

The enumeration is by local people, who are familiar with the social environment and physical characteristics of the area, and the Area Executive Committee Members.

Supervision is by the District Authorities; in this setting the District Executive Committee is the appropriate body.

The Key-informants are representatives of the village and its settlements and local group representatives (women, business people, NGOs, etc).

The output is a completed and checked questionnaire that provides all necessary village accessibility data.

3.2 The Questionnaire

The Pilot Integrated Rural Transport Project has used several, different, data collection forms. These served as a basis for a revised questionnaire to fit the requirements of data collection for district level planning. All data

requirements on village level for the Local Governance and Development Management Programme are also included in this questionnaire.

The final draft version of this questionnaire is attached in *Annex 2*.

In brief the questionnaire contains the following subjects:

- ❖ Primary village data on transport time, means of transport and ease or difficulty of reaching the service or facility in each sector.
- ❖ Data on each particular facility in each sector, such as location, condition and quality of service, queuing time as perceived by the villagers and the catchment areas of the facilities.
- ❖ Accessibility problems as perceived by the villagers regarding travel time, means of transport, sectors, etc.
- ❖ Priorities for interventions as proposed by the villagers to address their predominant access problems.

The questionnaire starts with a section that describes the “village particulars” and then proceeds to address each sector.

3.3 Preparation

The first step in preparing for data collection is to make an inventory of the number of villages in the district. The District Commissioner’s office will be able to provide a list of “officially recognised” villages.

The next step is to mark all villages on 1:50,000 NSO² topographical maps, with assistance from Area Executive Committee members from all the ADCs.

These 1:50,000 maps, although very suitable in terms of scale and type of topographical information, are not always up to date. It is therefore recommended to update the maps, especially in terms of villages, AEC & ADC boundaries and the road network.

Organisation of enumeration groups with their supervisors and allocation of groups to areas and villages should be done before training the enumerators and supervisors begins. Informing the villages of the

forthcoming survey and requesting specific participation should also be done well in advance. The district authorities are responsible for this task. It is recommended that the VDCs are asked to collect information on numbers of households per settlement for each village and to have this information ready before the survey teams make their appearance.

Final programming for the survey, such as when each team will visit a specific village, needs to be worked out by the supervisor and his or her enumeration teams.

3.4 Human Resources

Enumerators

The Pilot Integrated Rural Transport Project has tested how data can best be collected: looking at the costs, the quality, the time span required and the participation and acceptance by people involved. There were three possible options for the operation:

1. Conduct the data collection using only project staff,
2. Collect data involving DEC personnel and professional enumeration teams
3. Involve VDC and ADC members in the enumeration with supervision by the DEC.

The first option was rejected for obvious reasons; the project would remain a separate entity in the district and this would not create ownership amongst the district officials. The second option was also rejected because hiring external professionals would increase the costs of the exercise and not necessarily improve the quality. As many villages needed to be surveyed the exercise would probably take too long.

The third option was chosen because involving local enumerators creates ownership and participation on a longer term basis. Local knowledge of the situation is also an important advantage in terms of quality control. In addition, the costs of the exercise would be acceptable.

For future replication of accessibility planning and data collection the Dedza model evaluated positively and can be recommended.

Criteria for selection:

- ❖ The candidates should be literate, preferably be a member of the Area Executive Committee (AEC) and be available for the duration of the survey, which for an average district size will be about 3 weeks.
- ❖ Enumerators are to be selected by the DDO, the DHRDO (District Human Resources Development Officer) and the APO (Area Planning Officer).
- ❖ Identification should take into account the place of residence. The enumerators should operate in the area where they live themselves for two reasons. It will reduce transport costs and the enumerator is familiar with the situation in the villages under his or her responsibility.
- ❖ The total number of enumerators required depends on the time span allocated for the survey, the number of villages and the team size. It is recommended that no more than 30 villages be allocated to each enumeration team, the team size being two persons.

The enumerators are responsible for the following:

- ❖ To organise and pre-arrange field visits in agreement with their supervisor.
- ❖ To complete the interviews in all allocated villages in accordance with the planning.
- ❖ To ensure that all settlements of each village are represented and that the key informant group is truly representative of the village.
- ❖ To ensure *consensus* is reached on all answers given.

Supervisors

The whole exercise will be new to most participants, as a result a well-structured supervision with a sufficient number of supervisors is essential. The Dedza experience has shown that a full time supervisor can effectively conduct his or her task, supervising up to 3 enumeration teams, provided the supervisor has a vehicle designated to him full time. The total number of supervisors thus required is at least one third of the total number of enumeration teams.

If IRAP is to be incorporated into the District Planning System, it is recommended that the DEC officials should be responsible for the supervision, this is because later these same officers will also be involved in the analysis and interpretation of the information.

The supervisors are required to carry out the following tasks:

- ❖ To plan the interviews with the enumeration teams.
- ❖ To give logistic support to the enumeration teams, whenever needed.
- ❖ To supervise their allocated enumeration groups in the field, by regular visits on a rotational basis.
- ❖ To give guidance and advice to the enumerators during the interviews.
- ❖ To check, discuss and where necessary correct the information collected.
- ❖ To collect the filled questionnaires and to deliver them to the district headquarters for processing.

In diagram format the supervision-enumeration organisation can be visualised as follows:

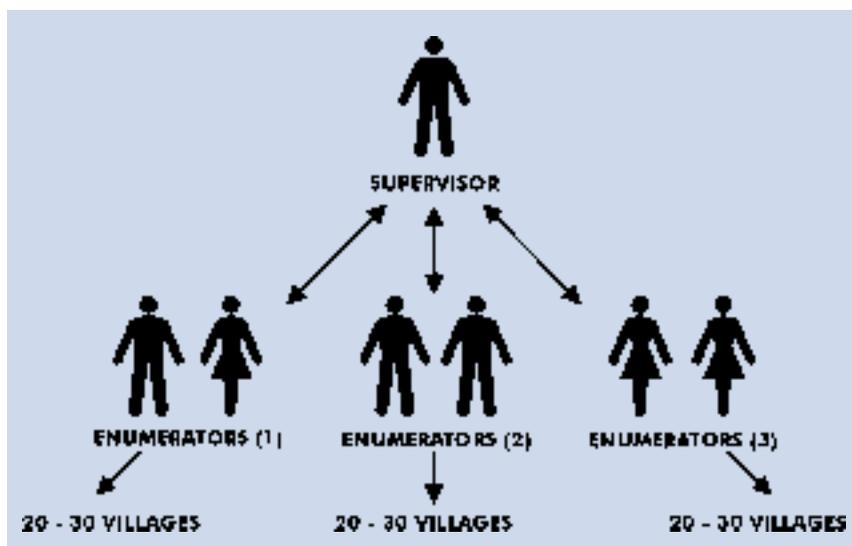


Figure 5: Organisation of Supervision

3.5 Training in Data Collection

The people who conduct the data collection exercise may not be fully conversant with the techniques used in data collection surveys. Therefore, it is necessary to equip the enumerators as well as the supervisors with the appropriate tools and knowledge to successfully accomplish their tasks. The training entrance level should not be set too high, as long as the trainees have basic skills like the ability to read and write.

Output of the training:

- ❖ At the end of the training the trainees should be fully familiar with the data capturing techniques and understand the purpose of the data collection exercise.
- ❖ The enumerators should be able to conduct the survey.
- ❖ The supervisors should be able to support the enumerators in the field.
- ❖ The supervisors and enumeration teams should agree on the time schedule and planning of the survey.

Number of Training Groups and Size:

It is strongly recommended that the number of trainees in one group is less than 20.

There should be enough enumerators and supervisors trained to complete the data collection exercise within a few weeks. This depends on the number of villages in the district; as a guideline one team (of 2 enumerators) will carry out the survey in 30 villages, covering 2 villages per day. Each supervisor will be responsible for 3 enumeration teams.

Example: 900 villages. Target: 3 weeks

Total teams required:

2 villages per day per team;

15 working days: 30 villages per team in 3 weeks.

Thus $900/30 = 30$ teams = 60 enumerators.

Three enumeration teams are supported by one supervisor; hence total 10 supervisors required.

Keeping the maximum group size to 20 participants this results in 4 identical training sessions.

Duration of Training: 5 days for enumerators, 6 days for supervisors.

Content and structure:

Day	Topic	Trainees
1	Translation of Questionnaire and Consensus Building	Enumerators & Supervisors
2	How to apply PRA Techniques	Enumerators & Supervisors
3	How to apply the Questionnaire	Enumerators & Supervisors
4	Field trials	Enumerators & Supervisors
5	Evaluation of Field Trials	Enumerators & Supervisors
6	Extra day for Supervision Training	Supervisors

3.6 The Survey

The actual survey should start immediately after the training. Each supervisor drafts a work plan agreeable to the three interviewer-groups including the dates and times for meeting for each village.

When more than one training session is required, the survey can be staggered; when the first group is trained, the enumeration teams and their supervisors should start in their designated area.

To ensure the quality of the output, the supervisor monitors each enumeration team during their first two village interviews at least. Only when the supervisor is convinced the enumeration team is fully capable to continue on their own, he may leave them and start monitoring the second team and thereafter the third.

Following this start up session the supervisor will rotate over the 3 teams and continue monitoring. Thus, each team will be supervised for a full

day, once every three days. The supervisor, therefore, needs to be in the field all the time, until the data collection in their designated area is completed.

The supervisor needs to agree on a schedule of delivery of completed questionnaires to the district headquarters for further processing. The questionnaires need to be handed in at least once every week. When the supervisor is unable to return to the district centre, arrangements need to be made to collect the forms from the field.

Footnote

² *The National Statistical Office (NSO) issues ammonia copies of topographical maps on A1 size.*

Chapter 4

Data Entry

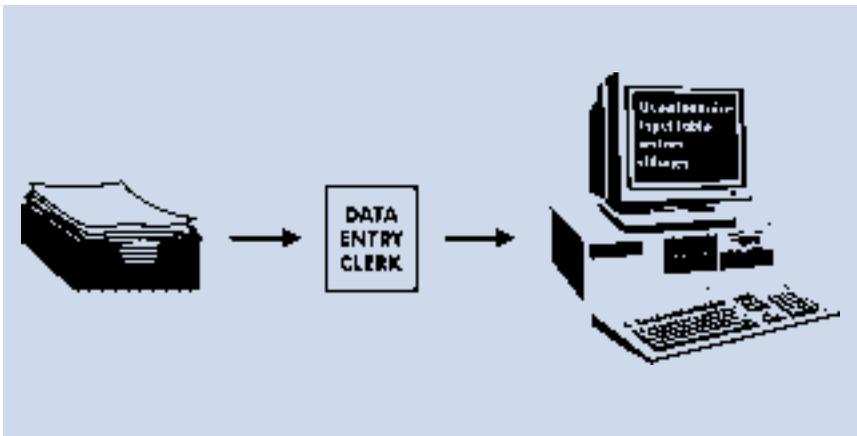


Figure 6: Diagram of Data Entry

4.1 Data and Information

Before going into the technicalities of data processing it is useful to distinguish between data and information.

'Data' is defined as "facts taken as 'true' as the starting point of a piece of reasoning". This implies there is useful data and data which is redundant to the purpose. The amount of data available is almost always too great to be of practical use. It is consequently essential to set boundaries to the amount of data collected and extract only the useful data for a given purpose. In our case this means data directly related to accessibility planning.

The questionnaire is the *selection tool* for data collection; only relevant data is accumulated.

However, even *selected* data is not necessarily a synonym for *information*. Data becomes information after further assessment, filtering and ranking is applied. In other words: 'data' needs to be processed to make it 'information'.

Data analysis and *mapping* are tools to *transform* selected data into the required information. This transformation process is a simplification of reality. It is a (simulation) model by which we, the users, describe the reality to achieve our objectives. In the context of IRAP the objective is to obtain information on accessibility of rural communities with the aim to enable us to make justified decisions on interventions in rural development.

The utilisation of computers in this process is a practical necessity because it makes simulations easy and quick. It also allows data and information to be kept for future use. However, before the user can benefit from these advantages, a time consuming but essential activity needs to be completed – this is the *entry of data* into the computer system. This chapter will discuss the data entry exercise, how this is done and what resources are needed.

4.2 Input and output

Chapter three described the IRAP process up to the point where accessibility data of all villages was collected in village fact sheets (questionnaires).

This data forms the input for the next step: data entry. This activity results in a computerised 'data base'; all the data is transformed into analysed categories and is ready for further processing (see figure 6 above).

The filled and field-checked questionnaires are delivered to the district headquarters for further processing.

For administrative reasons and to assist filing, each questionnaire needs to be given a code number. There are two options for numbering the questionnaires:

- (1) in order of receipt or
- (2) based on the location of the village, so the questionnaires are numbered before the start of the survey.

The latter method is preferred, with each village having a code number allocated in advance. This makes grouping per VDC and ADC easier and more transparent.

Upon receipt of the questionnaires the answers to the questions need to be coded. After coding the data is ready for entering into the computer(s).

The data entry clerks will use a simple statistical computer programme such as the SPSS software package. The method of encoding and data entry will be explained in a separate training manual. After the data is entered into the computer, a thorough check is made on the output, using the printed listings per village.

To accomplish the above, a number of requirements need to be fulfilled. These relate to resources and organisation.

Resources:

To achieve satisfactory data entry the following resources are needed:

Equipment:

- ❖ Personal Computers with 16 MB RAM minimum memory. The number of PCs depends on the time frame in which the data entry activity should be completed. As a rule of thumb: one station (operator with PC) can process data of 15 to 20 questionnaires per day.
- ❖ One (Laser) printer.
- ❖ Computer diskettes and paper.

- ❖ Statistical analysis software for data entry.

Human Resources:

- ❖ Data Entry Operators will be based in the district headquarters. The number of operators will depend on the time frame of the activity.
- ❖ One Data Entry Supervisor. This will be a member of the DEC responsible for the progress and quality of the data entry. It is strongly recommended this person is the same one who is responsible for the data analysis, which follows immediately after the data entry.

Summarising the above in a diagram shows:

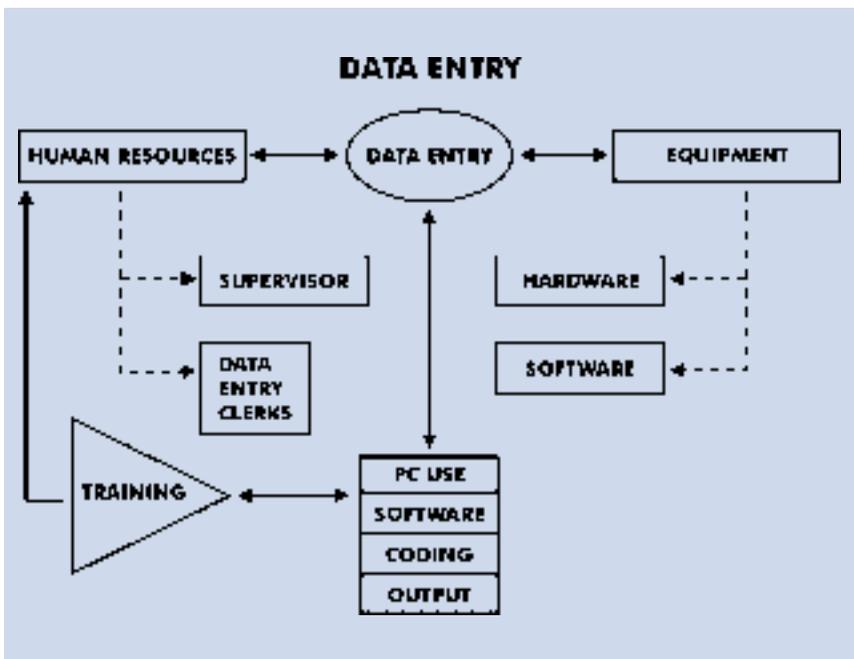


Figure 7: Diagram of Inputs for Data Entry

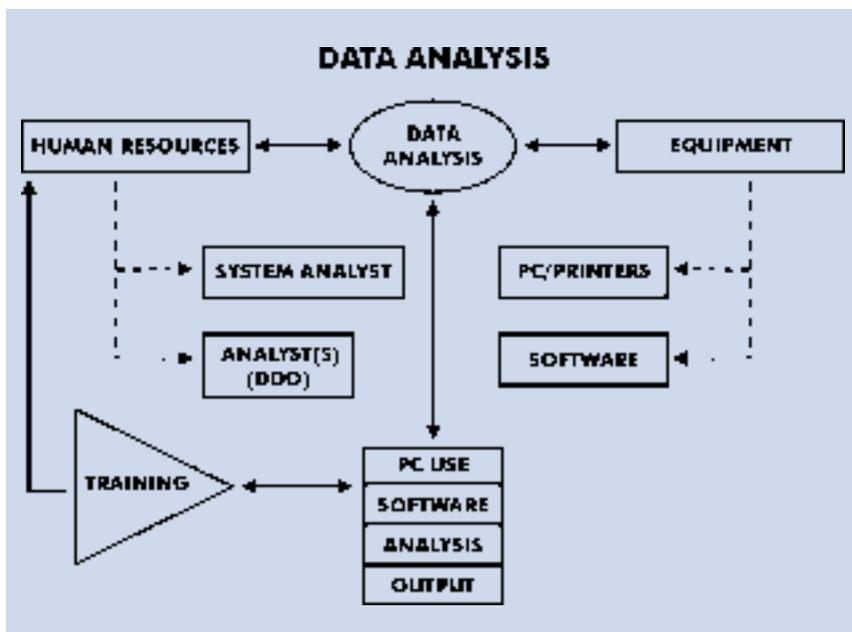


Figure 8: System for Data Analysis

In the above figures a Training Input is also incorporated. Paragraph 4.3 will discuss this component.

Organisation:

Data entry is time consuming and must be completed before the data analysis can start. Good planning and organisation of the work for the data entry stage is essential to bring it to completion speedily.

The following needs to be done:

- ◆ Set up an administration for village questionnaires viz.:
 1. Assigning Code numbers.
The code number will have three parts:
ADC code – VDC Code – Village code
 2. Opening files per ADC, VDC and villages: setting up hard-copy files and a filing system.

❖ Arrange back-up procedures:

At end of the each day, the operators have to make back-ups of the files entered and saved on the hard disk. Two diskettes are provided to each operator (for each station). One is used for back-up one day and the second on the next day – they are used alternately. In this way the data is secured, even if the hard disk and one of the backup diskettes fails. The back-up activity should be executed meticulously and supervised by the Data Entry Supervisor.

❖ Check procedures:

Methods used for backing up procedures are valid for checking; every day the Data Entry Supervisor should check the entered data of all the stations. The easiest way of doing this is to transform the coded data (numerical) from a sample of questionnaires back into logical data (descriptive strings) and compare the entered data with the questionnaire.

❖ Work schedule:

Knowing the gross time needed to complete the data collection, a time plan is drawn up for coding and data entry. Each operator should know what is expected in terms of output and when to execute this.

The Output

The final output of the data entry exercise is a *Computerised data base* and transformable into any other spreadsheet or database format.

The database consists of data, ordered by village, VDC and ADC.

Data of all sectors can be presented for one village but also listings of all villages in one sector. The data is encoded but can also be viewed as strings (words). All data is checked against the original questionnaires and printed and filed under VDCs and ADCs.

All data is backed-up on two sets of 3.5" diskettes.

4.3 Training

Although the data entry exercise is fairly straightforward, training is required for both the data entry clerks and the supervisor.

Outcome of the training:

At the end of the training the trainees must be fully familiar with the software and the data entry techniques and fully equipped to execute their tasks. More specifically, the trainees will build on their skills in operating the computer and printer, handling the files, coding and data entry and backup procedures.

Trainees:

All data entry clerks and the supervisor need to be trained. It is suggested that two more clerks are trained than will be required to carry out the work, this will help to avoid delays in case of illness or other reasons. The entry qualification for the training should preferably be at Junior Certificate or at higher level.

Duration:

5 days

Content and structure:

The trainer, a computer analyst, will set up the structure and the data encoding list or 'dictionary' for data entry. The dictionary consists of values and ranges for the specific variables. Most of these activities will be done prior to data entry training.

Day	Topic
1	Brief introduction to the PC and its operation
2	The software
3	Coding and data entry
4	Practical exercises
5	Output and back-up

Chapter 5

Data Analysis

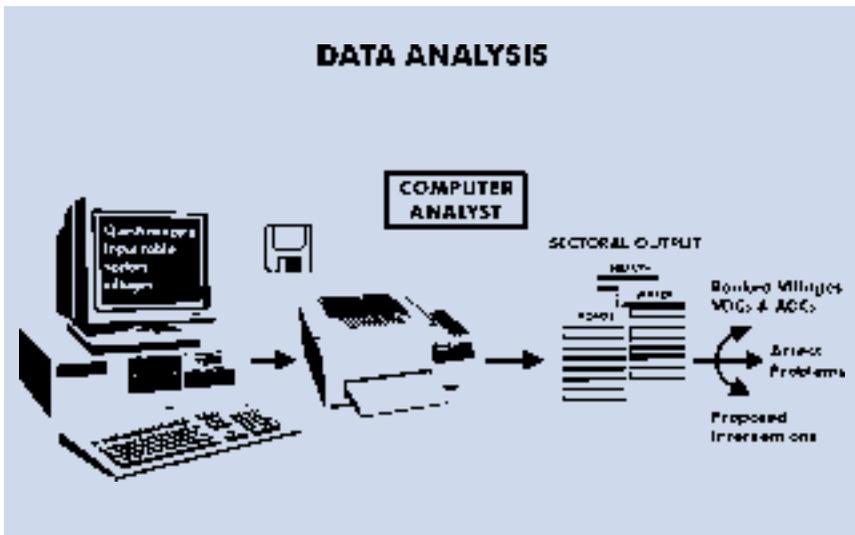


Figure 9: Diagram of Data Analysis

5.1 Input and Output

After data is entered into the database in the computer, it is available to be analysed. The process required to transform the stored Accessibility Data into the desired Accessibility Information again depends on resources such as skilled personnel and equipment. The output of the Data Analysis will be tables of accessibility indicators per village per sector, if required ranked and grouped per ADC or VDC. There may

also be information on access problems for any selected area and a list of proposed interventions to solve the access problems.

Analysis Output

Accessibility Indicators:

- ❖ An important part of the analysis is the use of Accessibility Indicators (AI).
- ❖ Accessibility Indicators show relative degrees of difficulty in accessing facilities and services.
- ❖ These “AIs” are defined for all sectors in which “access to” is important. Calculation of AIs is mostly done on the basis of travel time. However in some sectors queuing time is another important factor to be considered: the queuing time indicates the “pressure” on the facility, e.g. at boreholes and grinding mills.
- ❖ The Indicator quantifies the size of the demand from households and the degree of the transport burden in a given area.

$$AI_{TT} = TT * HH$$

in which:

HH = Number of Households permanently residing in a given village, ward or area under consideration.

TT = Travel Time or Transport Time that an average household spends to reach a facility or service.

AI = Access Indicator - The multiplication of (travel or queuing) time and the number of households. This quantifies the level of difficulty with which households access a given need, facility or service; in ‘household minutes’

Because it takes into account the *population, in terms of ‘Households’ of each community* (i.e. a village), it can be used to compare the accessibility situation of villages, or groups of villages (VDCs), Wards (ADCs) or even Districts within the sector.

Hence the Access Indicator is a relatively *neutral unit* of measurement. It can be used to assess the level of difficulty that people encounter in all activities from reaching their water supply to making social visits. In addition, it can show the magnitude or size of the problem, and how widespread or common it is.

Derived access indicators for different levels are for example:

The percentage of households per ADC or District that has a safe working water supply point within x minutes reach, or the total number of households making use of a particular health facility.

In some cases it may be desirable to include in the analysis a weighting factor or 'scores' for the type of transport used. The IRAP guideline for Tanzania³ suggests modifying the AIs by multiplication with such a factor. Although the idea behind it is logical, as transport by bus is less of a burden than travelling by foot carrying heavy loads, it is very difficult to rate the factor. For the same reason the use of 'frequencies of use' and the comparison in 'importance' between sectors was rejected as not practical. At the end of the day, problems and priorities must be identified by the villagers themselves. Objective comparison within one sector is still possible using 'household minutes' as indicator.

The data collection also gathers information on the use of IMTs and public transport in combination with travel and transport in "other sectors". These figures can show if the means of transport is a hampering factor or not.

All household numbers in the villages are known and it can be determined which facilities people use. It is then possible to estimate the catchment areas of each service. This is important in almost all sectors, but especially useful to find out for facilities that serve larger population groups, like health centres, grinding mills and schools.

The output from the data analysis will be:

- 1 Per ADC: priority villages/VDCs in each sector based on the AI in that sector.

- 2 Catchment areas of facilities, in terms of total households served and travel time.
- 3 Listed problems of Villages, VDCs and ADCs, as prioritised by the village people.
- 4 A list of interventions that may best address the access problems, again as perceived by the villagers.

Annex 4, Notes on Access Profiles, gives examples of analysis output tables (these may updated after the questionnaire is finalised).

Prioritisation:

As the output of the data analysis provides an objective basis for assessing the access situation in each sector, this can be used to prioritise villages, VDCs and ADCs. Thus, AI allows the ranking of villages or VDCs. The “worst off” villages per sector can be identified and hence prioritised for intervention. To complete the picture an additional tool is used: mapping. For example, by using maps with access information such as the area of influence of facilities, ‘the present catchment’ versus ‘projected catchment’ for health delivery areas can be made. Chapter 6 will discuss this further.

Resources required for data analysis:

Equipment & software:

- ❖ 1 Personal Computer with 16 MB RAM.
- ❖ 1 printer.
- ❖ Computer diskettes and paper.
- ❖ Statistical analysis software.

Human Resources:

- ❖ Data Analyst, based in the district headquarters. This person should ideally be the DDO or another member of the DEC.
- ❖ Systems Analyst. This professional has the task of training the district official.

5.2 Training in Data Analysis

The data analysis training should be undertaken within the training programme for the Local Governance and Development Management Programme for DEC personnel.

As the data is going to be analysed by particular people, these officers also need to be trained in the use of the computer package.

Output of the training:

At the end of the training course the trainee is expected to be fully familiar with the software and the data analysis techniques, so as to be capable of using the software in a flexible manner to produce a variety of requirements.

Trainees:

The people who will be trained are those who will be involved in the analysis. As suggested earlier the DDO and/or the DHRDO co-ordinator at least should be trained, but preferably also one or two other DEC officials.

Duration:

Expected 10 days

Content and structure:

A clear manual in statistical computer packages will be prepared by the project organisers, in close collaboration with the specialists from the Local Governance and Development Management Programme and a data analyst from the centre of Social Research or the NSO.

Footnote

³ *"A Guide to Integrated Rural Accessibility Planning in Tanzania, Edward H. Mhina, ILO/SDC, March 1997"*

Chapter 6

Mapping

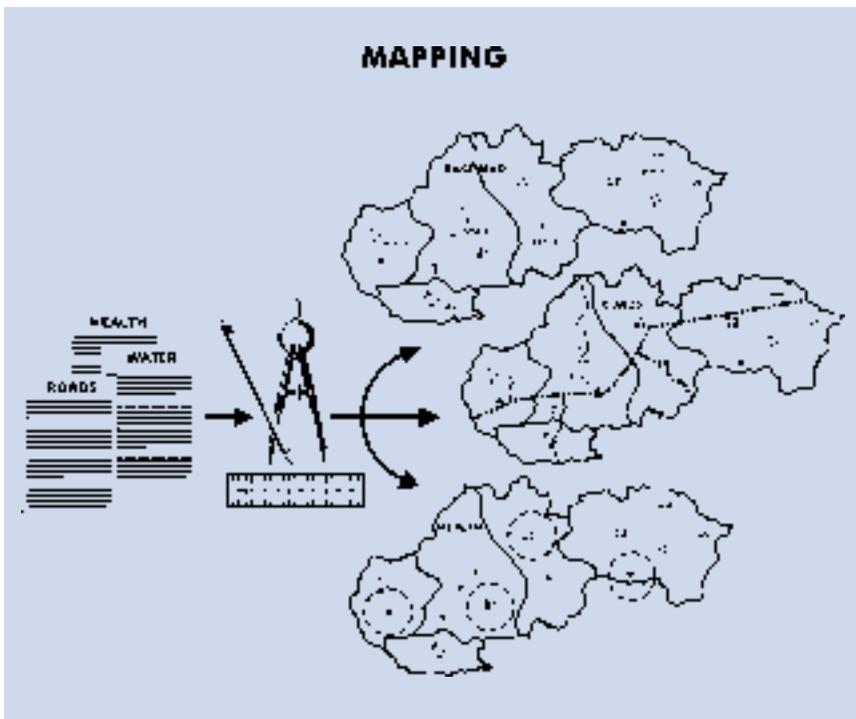


Figure 10: Diagram of Mapping

6.1 Objective and Method

Information can be presented in different ways. Tables, graphs and listings are helpful to give the user the information he needs, but

sometimes we need different methods of presenting information.

As the planner in accessibility is concerned with geographical areas (VDC, ADC and District) and much of the information is connected with the physical infrastructure or locations of facilities, a map is the best tool to present and visualise the situation. But, in addition to this, a more important reason for mapping exists:

The objective of “mapping” is to clarify the situation visually, and by doing so to show what otherwise perhaps remains unnoticed.

The art of mapping is omitting information; too much information on a map can be counter-productive. It is essential not to lose the overview. A technique for highlighting useful information, but also making it available only when needed, is the use of transparent “overlays”.

An overlay presents a certain sector or topic, this is only a part of all the information that could be mapped out. Combining overlays creates the picture that is specifically required by the planner.

The maps that can be used as a basis are the 1:50,000 scale NSO topographic maps. Most maps show one or two Traditional Areas, depending on the size of the area. The size of the maps is approximately 110cm x 60 cm.

The following information is presented on the maps:

- ❖ Villages and towns
- ❖ Streams, rivers and water bodies
- ❖ Roads, tracks and bridges
- ❖ Mountains, hills and forest areas
- ❖ Some specific features like ADMARC centres, schools and hospitals.

As the maps are not always up to date, it is important to check the features on the maps and amend them wherever necessary. The first and most essential correction relates to the villages and VDCs. The district administration will have updated lists of all the ‘officially registered’ villages in the district.

6.2 Input and Output

The starting point from which the mapping exercise commences is the analysis results: sectoral information per village and VDC per ADC, ranking lists and catchment information. This information is then translated onto maps and transparent overlays, by DEC personnel and draftsmen (see figure 10).

The inputs for mapping are:

- ❖ Updated 1:50,000 NSO maps per TA (ADC)
- ❖ Drawing equipment:
 - Tracing paper,
 - Pencils, drawing pens, rulers, markers, etc.
- ❖ Trained DEC personnel
- ❖ Professional draftsman

It is recommended that all departmental heads who are members of the DEC are involved in the mapping exercise.

DEC personnel are the end-users of the maps; they will draw conclusions from them and they will determine if situations should be further clarified or verified, using different combinations of overlays or additional overlays.

Mapping is an *iterative* process! It is *only effective* if the users, i.e. the planners, are fully involved in the process themselves. The mapping will assist understanding of the situation in each sector, *and* in its turn raise questions that perhaps can be answered by continuation of the mapping exercise, i.e. combining maps and producing new overlays. Once the heads of departments are fully conversant with the situation in their own sector they may want to combine and share this information with other sectors. *Then the exercise becomes integrated.*

A professional draftsman is needed to work out the final maps and also to assist the DEC personnel with the basics in applying mapping tools, i.e. what symbols and keys to use.

Training:

The use of maps in the manner described above, is new to most of the district officials in Malawi. Therefore, training in mapping is a prerequisite to achieve the desired output. A training course is suggested where sectoral DEC personnel are taught how to apply maps and how to make transparent overlays.

The initiation workshop at the exercise in Dedza used a few examples, which could serve as models in future training activities.

The project personnel of PIRTP were conversant with the techniques and they could moderate these training sessions. It is recommended that real life examples (for instance from Dedza) are used to work out training exercises.

The outputs of the mapping exercise are Sector maps and overlays for each ADC.

The next paragraph will give suggestions as to which maps to prepare.

6.3 Suggestions for Mapping

Below follows a list of suggested maps per sector. This list is by no means exhaustive; having prepared these maps one probably will need other combinations of maps. The situation will command which other maps to make.

Village structure sector:

- ❖ Base map showing all villages and names, VDC boundaries and names, Household numbers per VDC
- ❖ Overlay with actual household numbers per village
- ❖ Overlay with actual population age distribution per VDC
- ❖ Overlay with villages coded by ethnic group, language, etc.

Water sector:

- ❖ Base map with all water points (WP), indicating type and condition
- ❖ Overlay with all water points working in the wet season only
- ❖ Overlay with all water points working all year round
- ❖ Overlay with all water points and household numbers using each WP, dry season
- ❖ Overlay with all water points and household numbers using each WP, wet season
- ❖ Overlay with average travel time per VDC
- ❖ Overlay with average queuing time per VDC
- ❖ Overlay with percentage of HH with pit latrine per VDC.
- ❖ Overlay with gender distribution of transport.

Health sector:

- ❖ Base map showing all health facilities as type, e.g. hospital, health centre, clinic, dispensary etc.
- ❖ Overlay with circular health delivery areas (5 km radius for health centres) *and* with 60 minutes ISO-lines.
- ❖ Overlay with actual catchment areas.
- ❖ Overlay with *Access Indicators* per VDC

Education sector:

- ❖ Base map showing all schools as type, e.g. junior and full primary.
- ❖ Overlay with circular target catchment areas in km radius *and* with target catchment areas in minutes.
- ❖ Overlay with actual catchment areas.
- ❖ Overlay with *Access Indicators* per VDC
- ❖ Overlay with common problems, e.g. reasons for not going to school

Grinding mill sector:

- ❖ Base map showing all facilities as type, e.g. maize grinding, rice, etc., diesel/electric.

- ❖ Overlay with actual catchment areas.
- ❖ Overlay with *Access Indicators* per VDC.
- ❖ Overlay with means of transport in common use.
- ❖ Overlay with gender distribution of travel (transport).

Market sector:

- ❖ Base map showing all markets as type: private, ADMARC, council.
- ❖ Overlay with actual catchment areas per market.
- ❖ Overlay with *Access Indicators* per VDC.
- ❖ Overlay with means of transport in common use.
- ❖ Overlay with gender distribution of travel (transport).

Fuel/firewood sources:

- ❖ Base map showing all woodlots, nurseries and other sources of firewood.
- ❖ Overlay with *Access Indicators* per VDC.
- ❖ Overlay with means of transport in common use.
- ❖ Overlay with gender distribution of travel (transport).

Means of transport:

- ❖ Base map showing number of IMTs per Village and VDC
- ❖ Overlay(s) with type and number of IMTs per VDC.

Transport services:

- ❖ Base map showing public transport routes and type of transport
- ❖ Overlay(s) with type and number of IMTs per VDC.

Socio-Administrative Services:

- ❖ Base map and overlay showing public administration facilities, e.g. bank, tax office, etc.

- ❖ Overlay(s) with dominant institutions offering employment, e.g. estates, factories, etc.

Infrastructure and Roads:

- ❖ Base map and overlay showing all roads and bridges.
- ❖ Overlay with main tracks, footpaths and foot bridges.
- ❖ Overlay with streams and rivers for dry season and wet season.

Access Problems and Priorities:

- ❖ Overlay with main access problems per VDC.

Community Projects:

- ❖ Overlay with projects in execution and in preparation per VDC.

6.4 Example of Mapping

Annex 3 gives an example of mapping dealing with access to health facilities. The data and the maps are imaginary.

Drawing the catchment around a facility will make clear where people, who make use of that facility, are coming from. Is the real catchment area the same as was envisaged when the facility was realised? For example, a Health Centre is constructed and equipped to provide a service for an area of five kilometres radius and is expected to serve a certain number of households (about 2000). This facility is thought to be in reach within one hour. Drawing the one-hour catchment, that is the real catchment of villages within 'one hour' distance of the facility, will show if the assumed circular catchment coincides with this. Drawing the catchment that includes *all* the villages that *in reality* make use of the facility, will show where, in fact, the people are coming from. Combining these maps and the data will help the planner for instance to assess where best to locate new facilities or to improve the infrastructure within the present catchment.

Chapter 7

Validation and Problem Ranking



Figure 11: Diagram of Validation/Problem ranking

7.1 Validation

Before the planner at district level can rely on the information coming out of the analysis this information needs to be validated in the field. The district authorities will go back to the respective ADCs and call for a meeting with all village and VDC representatives.

For each (ADC) validation a 'one day workshop' is envisaged.

The Validation Workshops will be held *in* the respective ADC's wherever possible.

What is to be Validated?

Data is collected at village level. This information is processed by entering it into a computerised data base, after which the data is 'analysed'. The output of the analysis is then interpreted and presented in tables and graphs. This output is likely to be incomplete or not entirely corresponding with reality.

Not the actual numbers, but the conclusions drawn from the figures, need to be verified:

- ❖ against the opinion of the VDC representatives
- ❖ in relation to priorities and problems identified in the survey
- ❖ in relation to proposals already formulated by the VDC's within the structure of the District Focus, MASAF, EU microprojects, etc.

More specifically, we have to look for contradictions between the data for each sector and the priorities given by the villagers and VDC. For example, if water is clearly a "problem" in terms of number of working boreholes or distances to the water points and this has not emerged as a problem after the analysis, then the validation has to make clear why this is the case, and if it is at all true.

It is important to notice which sectors appear to be problematic for the villagers, which trends are developing and why.

The Objectives of the Validation:

- ❖ The first objective of the validation workshop is to confirm that the data collected (and analysed) is a true representation of the situation on the ground.
- ❖ The second objective is to formulate accessibility profiles which reflect the access problems of the people in the area, in both absolute terms as well as in relation to other ADC's of the district.

- ❖ Thirdly, the workshop will give the rural communities an opportunity to participate in the formulation of their own accessibility situation with special reference to the problems and the solutions.

Expected Output:

The output should be a comprehensive description of the accessibility situation of the ADC complete with some suggested interventions to improve the situation.

It is anticipated that at the end of each respective workshop:

- ❖ A comprehensive description of the accessibility situation of the ADC has been established, clarified and validated.
- ❖ Access problems and areas of interventions have been identified.
- ❖ Community representatives are confident about the accuracy of the data and the interpretation of the situation.
- ❖ The beneficiaries have a good understanding of the different accessibility issues and their implications.

Participants:

The traditional authorities of the ADC under discussion would include:

- ❖ Group Village Headmen
- ❖ Secretaries of all VDCs
- ❖ Representatives of Line Ministries
- ❖ Representatives of NGO's
- ❖ Ward Councillors
- ❖ Members of Parliament
- ❖ Representatives of political parties
- ❖ Women organisations
- ❖ Representatives of main religious denominations
- ❖ The DDO and the DC and all relevant 'Sectoral people' from the DEC
- ❖ The training co-ordinator of the District

7.2 Problem Ranking

During the data collection interview the village representatives were asked to state which three access problems were the most critical and needed to be resolved first.

The questionnaire also gave the opportunity to express which solution(s) should be chosen to resolve the issues. However, at that time probably neither the enumerators nor the villagers were fully conversant with the scope of IRAP or with the relations between different accessibility factors.

After thorough analysis and mapping the planners should be able to widen the scope and to relate the problems the village faces, to other factors relating to access.

During the workshop the participants become better equipped to justify which possible interventions could assist in tackling one or even more of the pertaining problems.

Now, the problem ranking relates not only to the village situation separately, but places it in the picture of the whole ADC. This provides an opportunity to address accessibility on a larger scale and more effectively.

Chapter 8

Access Profiles

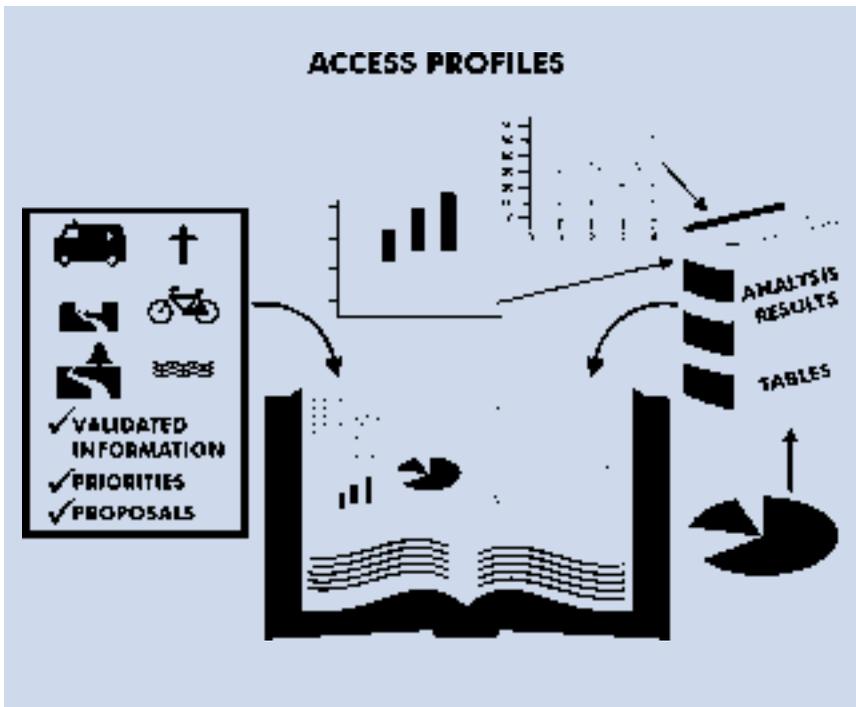


Figure 12: Diagram of Access Profiles

8.1 The Content of Access Profiles

The result of the whole exercise, from data collection to formulation and prioritisation of interventions, is called the *Access Profile*.

Access Profiles can be prepared for different levels, but the most practical level is the ADC.

The Access Profiles provide the planner at district level with an overview of the accessibility situation for each ADC. An Access Profile is basically a file that has the following content:

- 1 Accessibility situation per sector on three levels: Village, VDC and ADC (in tables and graphs)
- 2 Accessibility maps for each sector and combinations of overlays.
- 3 Descriptions of accessibility problem areas in the ADC.
- 4 Priorities in areas/sectors for interventions
- 5 An overview of projects and activities, relating to access, already in preparation or execution.

Annex 4, *Notes on Access Profiles*, is used to list the contents in tables and summaries.

8.2 Accessibility Situation Per Sector

This first section is the output of the validated analysis. For all sectors, the villages and VDCs are ranked in order of access to the services in that sector.

The Access Indicator provides a tool for comparison of villages (or other areas) within one sector. It however only provides an indication of the gross time per trip, spent by the community. A village does not necessarily *experience* an access problem if it has a high Access Indicator; the travel time of a big village could result in a high AI even if the travel times are short. Therefore other considerations also need to be taken into account, e.g. what is the *acceptable travel or queuing time*? This can be based on the district average or on the target time to that specific facility. The queuing time indicates if there are sufficient facilities provided in the area. This is an especially important indicator where it is not only the time spent travelling (or distance) to facilities, but also where the capacity of the facility is considered to be a problem, e.g. a protected water supply. Thus the availability of the facilities is crucial.

The following tables are included:

- ❖ The villages and VDCs are ranked by their Access Indicators for each sector.
- ❖ The catchment areas are listed by facilities in each sector; total household numbers and average travel time per facility.
- ❖ The access problems and priorities for action as perceived by the villagers.

8.3 Access Maps and Overlays

This section has already been discussed in chapter 6. Topographic maps and transparent overlays should have been prepared and attached. A description of the conclusions reached and the steps taken during this mapping exercise will help the reader to understand the maps. The sectoral maps and overlays are very much part of the Access Profiles.

8.4 Description of Access Problems

This section covers the interpretation of the analysis and validation output. Attention should be given to the type of accessibility problems pertaining in the ADCs:

- ❖ Physical infrastructure,
- ❖ Capacity and location problems; location and spatial distribution of facilities and quality of service.
- ❖ Transport services and other means of transport
- ❖ Socio-economic characteristics of the ADC
- ❖ Distribution of transport responsibilities and gender issues

The perception and opinions of the villagers as expressed in the ADC validation workshops and during the survey, as well as the “objective” assessment derived from the analysis should both be taken into account.

Thus, the ranking of access problems is the result of *combining*:

- ❖ The interpretation of accessibility information resulting from the analysis and mapping exercise, and

- ❖ The needs/problem assessment arising from the validation workshops.

All villages, VDCs and ADCs in the data base, are ranked in terms of access problems in each sector. Interpretation and mapping may provide a cross boundary and cross-sectoral view.

The villagers rank the problematic sectors and make suggestions for preliminary solutions during the interviews and validation workshops. These priorities need to be compared with the objective data output; e.g. the paragraph on the Access Profile should describe these.

8.5 Conclusions on Access Problems

The Access Profiles are prepared for all ADCs and for the whole district. The Access Profile should include a section that *summarises* and draws conclusions about the accessibility situation in the area under consideration.

It will list:

- ❖ major access problems (by sector)
- ❖ worst cases (VDC/Villages)
- ❖ relative access problem compared to other areas at equivalent level
- ❖ needs assessment/ best practice to address the issues.
- ❖ initiatives already undertaken (proposals/project execution)

Chapter 9

Targets and Priorities



Figure 13: Set Access Targets

9.1 Assessing Targets and Objectives

Most line ministries have established targets for their sector such as a minimum number of safe water collection points per number of households, or, the maximum travel distance for children to reach their school.

Targets can be established at any level, i.e.: village, area, district, regional and national.

These *sector targets* often reflect the ‘objectives’ of the line ministries for their whole sector. However, setting objectives and targets specifically

defined to improve access for the 'rural population' does not necessarily coincide with the targets for the sectors separately.

It is therefore important to set the targets or perhaps re-assess the existing targets, *after* the accessibility situation of the district is appraised, both sectorally and cross-sectorally.

Then *realistic and achievable targets can be set for local level planning.*

9.2 Define and Prioritise Project Proposals

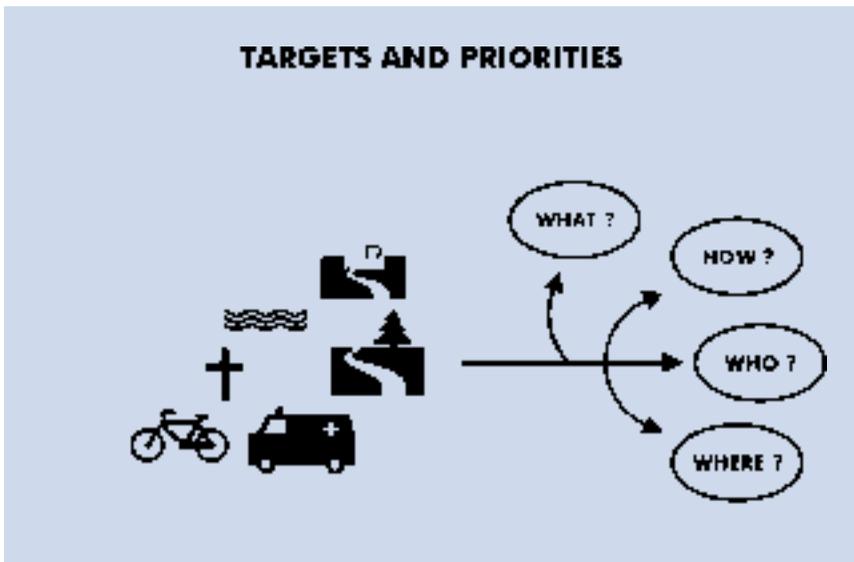


Figure 14: Define Projects and Proposals

There are two main categories of interventions that can ease rural access problems namely:

- ❖ Mobility enhancing interventions:
 - ⇒ Paths, tracks, trails, bridges, roads
 - ⇒ Intermediate means of transport e.g. bicycle, wheelbarrow, oxcart, bicycle ambulance, etc.

⇒ Motorised and public transport services

❖ Spatial planning for the location of services and facilities:

This deals with the optimum location of facilities relative to the communities they serve. Such interventions are aimed at reducing rural travel. Mapping is essential to determine these locations.

Integrated Rural Transport and Access Planning calls for identification of access priorities for reaching services and facilities. As well as pinpointing effective interventions to reduce the time and effort spent by rural households. It is imperative that decisions on interventions, in order that they adequately respond to the needs of the rural people, should be reached by fully participatory and integrated discussions.

Villagers look at their immediate needs and problems and will propose solutions that, in their opinion, will ease or relieve the problem. It is also normal that these proposals will be a reflection of the perceived opportunities. If, for example, a donor is operating in the vicinity funding the building of school blocks, the villagers will wish to make sure that their village is at the receiving end as well.

Within the setting of the District Planning System the village proposals are assessed by the VDC and after prioritisation, selected and sent to the ADC. At this level a further prioritisation is done and a selection of proposals is forwarded to the district authorities.

After the validation workshops a wider understanding of the access situation should have been achieved. Analysis and mapping assists in developing the ‘helicopter view’ – looking at access not only cross sectorally, but also across *village or VDC boundaries*.

Summarising, the following should be taken into consideration when drafting proposals for interventions:

- ❖ The officially submitted proposals from villages to potential donors (NGO, District Development Fund, Central Government, MASAF, EU, UN, etc.) may be genuine needs or merely ‘shopping lists’.
- ❖ The results of the validation workshops in relation to proposed interventions must be assessed.

- ❖ The “pro-actively” reached conclusions are a result of the analysis and the mapping exercise: What are the most cost effective solutions which solve as many access problems as possible, are beneficial to as many households as can be reached, and resolve the most serious existing problems?

A matrix is a useful tool in assessing appropriate interventions and describes the relationship between accessibility problems and possible interventions.

The next step is to share this understanding with the beneficiaries and to reach consensus on optimal solutions for the short, medium and long term. This feedback can best be done through ADC workshops.

These workshops should result in draft proposals for interventions.

Chapter 10

Implementation, Monitoring and Evaluation



Figure 15: Implement Interventions

10.1 Implementation

Within the Malawi context the intention is to integrate IRAP into the District Planning System. The IRAP steps are basically intended to relate Rural Access to Rural Development. The access planning results will lead back into the cycle of the District Planning System. Proposed interventions that address rural access will progress to projects for implementation within the framework of the district.

Formulating how to implement projects and which procedures to follow is therefore not further required in the context of this guideline.

There are however a few points to make that are specifically important in the context of Rural Access.

Implementation is often visualised as the diagram above; as a physical project like building a road or bridge or constructing a building.

However often access related interventions are not only these physical projects, but also deal with aspects like credit for bicycles or oxcarts, public transport and quality improvement of services such as health and education.

10.2 Monitoring and Evaluation

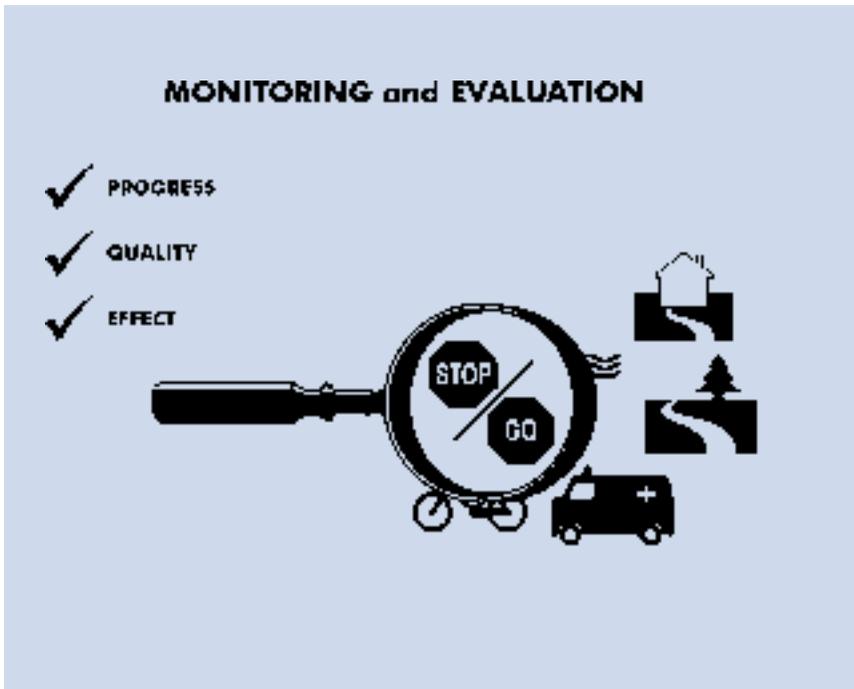


Figure 16: Monitoring and Evaluation

The whole purpose of IRAP is to improve the effectiveness of interventions in rural access. It goes without saying that this effectiveness needs to be checked.

Monitoring the process and the output may lead to adjustments or improvements.

The IRAP process has two feedback cycles:

- ❖ After validation (Chapter 7 or Step 5) (a) Does data have to be corrected and re-analysed? (b) Is the interpretation of the planner in keeping with the concept of the beneficiaries?
- ❖ During and after implementation; (a) Is the chosen intervention delivering the anticipated effect? (b) Are the targets correctly set?

The latter evaluation actually incorporates two different types of M&E:

- 1 Is the planning leading to appropriate interventions and consequently improving the accessibility for the intended beneficiaries, called evaluating the effect?
- 2 Is the intervention implemented as intended, called evaluating the project implementation?

The second type is the more conventional M&E, looking at the project indicators like design, timeframe, physical progress, quality and accountability.

Although the success of implementation in itself is a pre-requisite for the success of the whole planning exercise, the most important evaluation is to what extent the identified access problems are being solved. This should then lead to improvements of the IRAP planning cycle.

As the District Planning System caters for M&E already, the only addition to be made within that system is the specific focus on the effects of interventions related to accessibility.

Gender impact, being a crucial factor in rural access, should be given the appropriate attention. Incorporation of gender related factors in M&E must lead to more effective improvements of the IRAP cycle.

As a guide the following should be assessed and rated: –

- ❖ In the planning phase:
 - Are women involved in decision taking and priority setting?
 - How do identified problem areas affect women, men, and children?

- ❖ During Implementation:
 - Are the women involved in the implementation of projects?
 - Is the implementation affecting women/men positively/negatively in terms of labour participation or social changes?

- ❖ After implementation:
 - Does the project have the anticipated affect on women/men?
 - Are women/men satisfied about the project's effect?

Chapter 11

Integration of IRAP

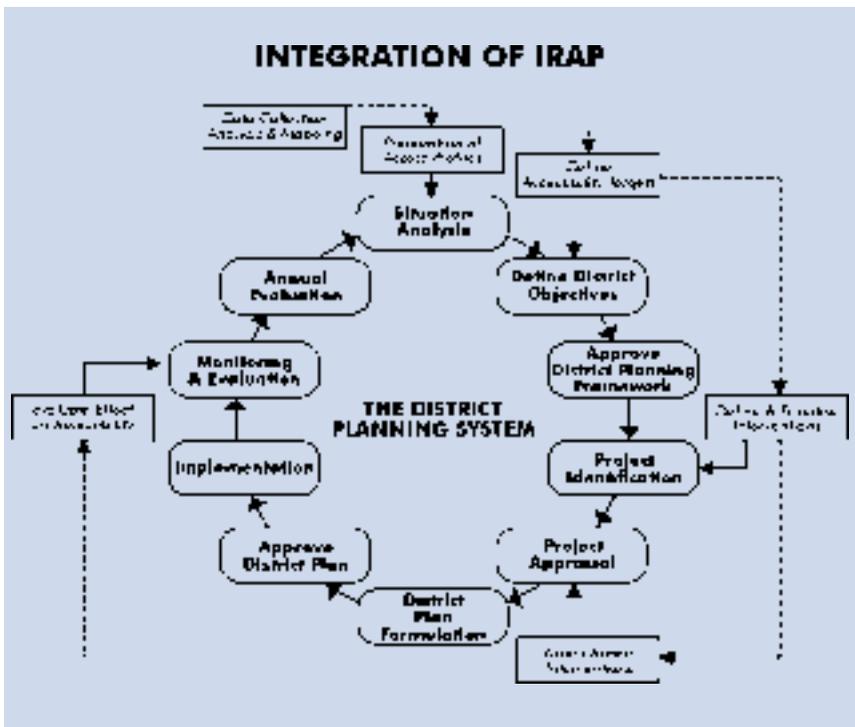


Figure 17: The District Planning Cycle

11.1 The District Planning Cycle and IRAP

In Malawi successful efforts have been made to develop a local level planning system. This system is introduced and piloted in 6 districts of

Malawi; these are the earlier mentioned *Local Impact Areas*. Now, under the *Local Governance and Development Management Programme* (6th Country Programme of the Government of Malawi and the UNDP), the planning system is being further developed and expanded to all districts of the country.

The figure above shows the cycle of the District Planning System⁴ :

It follows the process from identification and formulation to execution and evaluation. The addition is the inclusion of IRAP activities.

In the next table IRAP steps are related to the steps in the District Planning System:

District Planning System	IRAP steps
Situation Analysis	Data Collection, -Entry, -Analysis, Mapping, Validation, Access Profiles
Definition of District Objectives	Definition of Accessibility targets
Approve District Planning Framework	
Project Identification	Prioritisation of Access Problems & Project Identification
Project Appraisal	Prioritisation of Accessibility Improvement interventions
District Plan Formulation	
Approval District Plan	
Implementation	
Monitoring & Evaluation	Evaluation of impact on accessibility

If all steps of IRAP are incorporated it is useful to set them in a time frame as well. Taking into account the steps in the *District Planning System* an example of IRAP activities put into a planning calendar is presented in Annex 1.

11.2 The Merits of IRAP

In the previous paragraph we discussed briefly where IRAP should be fitted into the district planning cycle. In September 1997 the Government of Malawi and the UNDP started this process with an evaluation of the *Local Governance and Management for Development Programme* with the objective, amongst others, to formulate steps on how best to integrate the IRAP concept into the District Planning System.

The purpose of the establishment of Accessibility Profiles is to provide the district planners with a planning tool. By applying Integrated Rural Accessibility Planning, planners can make objective decisions in terms of prioritising sectors in specific areas through community participation. This might involve prioritising villages, VDC's and ADC's both within a sector and in terms of interventions.

The planner is armed with an overview of the whole district and can use this information for more effective planning. It enables the DEC to propose interventions that cut across several sectors, solving access problems in more than one sector or for more than one village at a time and by doing so *the funding of development interventions becomes effective and efficient.*

If one looks at the specific activities (steps) in IRAP, there are a few points that are worth mentioning:

- ❖ The information obtained through the IRAP approach, provides valuable and crucial insight in the pertaining issues in rural development. This relevance, therefore, justifies the inclusion of IRAP in the local level planning.
- ❖ Mapping out accessibility provides a visual aid and, more importantly, clarifies the access situation, which through other means alone might not become clear.
- ❖ The planner and the beneficiaries are better equipped to assess proposals for interventions pro-actively.
- ❖ Cross sectoral network planning becomes possible for infrastructure and alternative interventions like literacy classes for women, bicycle credits, spatial planning can now all result from one system.

11.3 Requirements for Integration

When looking at the possible integration of IRAP into the District Planning System the following should be considered:

- ❖ Accessibility is a determining factor in rural development and needs to be accepted as such.
- ❖ The pro-active approach in planning will need to be adopted; proposals will not only need to be assessed but district and area officials should be fully involved in the planning process, opening and moderating dialogues with the beneficiaries.
- ❖ Specific training needs in IRAP activities need to be planned and provided for within the planning framework.

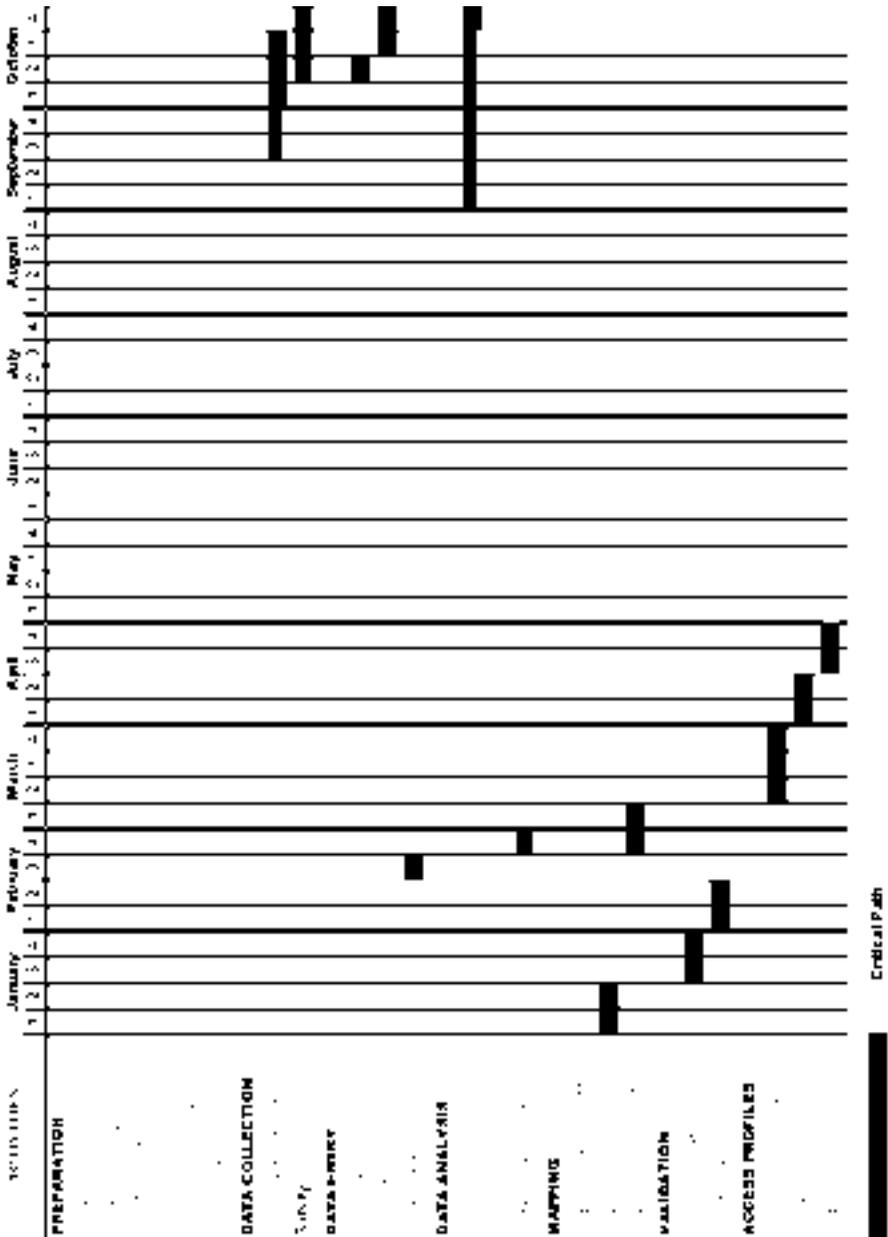
Footnote

⁴ Source: "Malawi District Development Planning Manual", MoLG&RD, November 1995

Annex 1

IRAP Planning Calendar

(see overleaf)



Annex 2

Ministry of Local Government & Rural Development: Proposed Village Level Questionnaire

For IRAP and District Planning

Lilongwe, June 1997

Village Level Questionnaire

Name of Village:

Key informants:

Name:	Title/position
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Data collected by _____

Date _____

Supervisor _____

Table VL01: Demographic Information for the Village

AC1.1	Name of Village				
AC1.2	Direction from District HQs				
AC1.3	Distance from District HQs				
AC1.4	Name of VDC				
AC1.5	Name of ADC				
AC2	Population	Information for the last 12 months			
		Male		Female	
		Living	Died	Living	Died
AC2.1	Under 1				
AC2.2	1 - 4				
AC2.3	5 - 14				
AC2.4	15 - 18				
AC2.5	Above 18				

Table VL02: Household number by Settlement

AC3	Name of Settlement	Household Number	
		Male headed	Female headed
	1		
	2		
	3		
	4		
	5		
	6		
	7		
Total No. of Households:			

Table VL03: Socio-cultural information

AD1	Names of ethnic groupings	Main Religious denominations	Languages spoken
AD1.1			
AD1.2			
AD1.3			
AD1.4			
AD1.5			
AD1.6			

Table VL04: Committees in the Village

AE1	Name of community committee	Membership		Projects/ Activities involved in	Code
		F	M		
AE1.1					
AE1.2					
AE1.3					
AE1.4					
AE1.5					
AE1.6					

Table VL05: Drinking Water Supply

(List All water collection points to which the villagers use, both *Protected* and *Unprotected* and both *inside* and *outside* the village)

Name Source (1): **in Village/Settlement:**

AF	Type	Condition	Code	Season of use	Code	Provided by	Code
AF1.1	Borehole	1 working all year	1	all year	1	Government	1
	Prot. shallow well	2 working only wet season	2	only wet season	2	NGO	2
	Protected spring	3 broken down	3	only dry season	3	Church	3
	Unprotected. shallow well	4		not in use	4	Self Help	4
	Unprotected spring	5				Other org	5
	Dambo	6				"Nature"	6
	Lake shore	7					
	River	8					
	Rainwater collected	9					
	Piped supply	10					

Name Source (2): etc...

Table VL06: Village Averages to Drinking Water

AF5	Time in minutes:		
AF5.1	Average Travel time single trip in Dry season:		
AF5.2	Average Travel time single trip in Wet season:		
AF6.1	Average Queuing time in Dry season:		
AF6.2	Average Queuing time in Wet season:		
AF7.1	Number of times a household collects water	Dry season:	1/2/3/4/5/6/7/8/9/10 per day
AF7.2	(circle one for each season)	Wet season:	1/2/3/4/5/6/7/8/9/10 per day
AF8.1	Who collects water:	Women	
AF8.2		Men	
AF8.3		Girls	
AF8.4		Boys	
AF9	Means of transport used:	Tick relevant means of transport	
AF9.1	Headloading		
AF9.2	Oxcart		
AF9.3	Bicycle		
AF9.4	Hand cart		
AF9.5	Wheelbarrow		
AF9.6	Pick-up / truck		
AF9.7	Donkey		
AF9.8	Other public transport		
AF9.9	Other (specify):		
AF9.10			

Table VL07: Sanitation situation in the Village

AF10	Sanitation :-	Code
AF10.1	Number of pit latrines	
AF10.2	Number of HH having pit latrines	
AF10.3	Number of flush water toilets	
AF10.4	Number of HH using flush water toilets	
AF11 Methods of garbage disposal		
AF11.1		
AF11.2		
AF11.3		
AF11.4		
AF12 Water /sanitation issues that affect development in the village		
AF12.1		

Table VL08: Environmental and Natural Resource Degradation

AF 13	Type of environmental and natural resource degradation	Causes of degradation	Code
AF13.1			

Table VL09: Health Facilities

(To which Health Facilities do the villagers go?)

Name Facility (1):		in Village/town:				
AG	Type	C	Controlled by:	C	Main problems:	C
AG1.1	Hospital	1	Government:	1	Too far:	1
	Primary Health Centre	2	Mission/CHAM	2	Water crossing problems:	2
	Clinic	3	Private:	3	Difficult terrain	3
	Maternity Clinic	4:	4:	4
	Dispensary	5				
	Traditional Healer	6				

The Health Facility is:	Code	Distance in Minutes:	Season	
			Dry	Wet
Easily accessible <i>all year</i> round:	1	on foot		
Easily accessible <i>only</i> in the dry season:	2	by bicycle		
Difficult to reach, even in the dry season:	3	by public transport		

NAME Facility (2).....etc.

Table VL10: Primary Education

(To which Schools do the children go?)

School Name(1): _____ **in Village:** _____

AH	Level	Code	Run by	Code	Main problems:	Code	
AH1.1	Junior Primary	1	Government:	1	Too far:	1	
	Full Primary	2	Mission:	2	Water crossing problems:	2	
				Private:	3	Difficult terrain	3
			:	4:.....:	4

The School is:	Code	Distance in Minutes	Season	
			Dry	Wet
Easily accessible <i>all year</i> round:	1	on foot		
Easily accessible <i>only</i> in the dry season:	2	by bicycle		
Difficult to reach, even in the dry season:	3	by public transport		
Estimated % of children of the village making use of this school:				%

School Name(2): _____ **Same table**

Etc..

Table VL11: Primary Education (Village averages)

AH	Access to school	Mode of Travelling	%
AH5.1		on foot:	
AH5.2	Percentage of children travelling	by bicycle:	
AH5.3		by public transport:	

Reasons why children do not go to school at all:		Tick relevant reason
AH6.1	School is too far to reach	
AH6.2	Difficult terrain	
AH6.3	River/stream can not be crossed	
AH6.4	Too few classrooms	
AH6.5	Too few teachers	
AH6.6	Religious / Cultural reasons:	
AH6.7	No money	
AH6.8	No Clothing	
AH6.9	Other (specify):	
AH6.10		

Reasons why children some days do not go to school:		Tick relevant reason
AH7.1	Work in the gardens	
AH7.2	Paid Labour	
AH7.3	Weather	
AH7.4	Difficult water crossing	
AH7.5	Sickness/hunger	
AH7.6	Other (specify):	
AH7.7		
AH7.8		
AH7.9		

Table VL12: Grinding Mills and Produce Processing

(To which Facilities do the villagers go?)

Name of Mill (1)		in Village:					
AJ	Type of Mill	Code	Type	Code	Distance (Min):	Season	
						Dry	Wet
AJ1.1	Grinding Mill	1	Electr. Powered	1	on foot		
	Rice / Wheat Mill/ husker	2	Diesel Powered	2	by bicycle		
	Other (specify):	3	Hydro Powered	3	by oxcart		
			Animal Powered	4	by motor vehicle		
The Mill is:		Code	Condition of the Mill: Code				
Easily accessible <u>all year</u> round:		1	Good				1
Easily accessible <u>only</u> in the dry season:		2	Often breakdowns				2
Difficult to reach, even in the dry season:		3	Out of order				3
Average waiting time (in hours):						Hour(s)	

Name of Mill (2)..(i) **in Village:**

Same table

Table VL13: Grinding Mills /Produce Processing (continued)

AJ5	How often does a Household go to	Number of times
AJ5.1	Grinding mill	
AJ5.2	Rice/wheat mill/husker	
AJ5.3	Others (specify):	
AJ6 Who usually go to the mills		
AJ6.1	Women	
AJ6.2	Men	
AJ6.3	Girls	
AJ6.4	Boys	
AJ7 Means of transport used:		
AJ7.1	Headloading	
AJ7.2	Oxcart	
AJ7.3	Bicycle	
AJ7.4	Hand cart	
AJ7.5	Wheelbarrow	
AJ7.6	Pick-up / truck	
AJ7.7	Other public transport	
AJ7.8	Other (specify):	
AJ7.9		
AJ7.10		

AJ8 If there is a Grinding Mill within the village, complete the following:

AJ8.1 Name of Grinding Mill:

AJ8.2 Type of Mill

AJ8.3 Owner of the mill: Male

AJ8.4 Female

AJ8.5 Number of employees Male

AJ8.6 Female

AJ9 Type of ownership (Indicate if single proprietor, Cooperative, Partnership, Limited company, etc.)

AJ10 Capital investment

AJ11 Total cost of production for last 12 months

AJ12 Annual sales (number of bags ground?)

Table VL14: Agriculture Activities in the Village

AK1	Main crops grown by the villages	If (part is) sold, What % of village harvest sold:
AK1.1	Maize	% sold
AK1.2	Wheat	% sold
AK1.3	Rice	% sold
AK1.4	Beans	% sold
AK1.5	Irish Potatoes	% sold
AK1.6	Sweet Potatoes	% sold
AK1.7	Onions	% sold
AK1.8	Green vegetables	% sold
AK1.9	Tomatoes	% sold
AK1.10	Peppers	% sold
AK1.11	Fruits	% sold
AK1.12	Cassava	% sold
AK1.13	Sorghum	% sold
AK1.14	Millet	% sold
AK1.15	Soya beans	% sold
AK1.16	Chick peas	% sold
AK1.17	Cow peas	% sold
AK1.18	Green Peas	% sold
AK1.19	Groundnuts	% sold
AK1.20	Other nuts	% sold
AK1.21	Sunflower	% sold
AK1.22	Other Oilseeds	% sold
AK1.23	Tobacco	% sold
AK1.24	Coffee	% sold
AK1.25	Tea	% sold
AK1.26	Sugar cane	% sold
AK1.27	Other (specify)	% sold
AK1.28		% sold
AK1.29		% sold
AK2	Estimate Number of Households with less than 0.5 ha of land	
AK3	Estimate the average distance to the gardens in minutes walking:	

Table VL15: Agriculture act. in the Village (continued)

AK4	Who is mainly responsible for the following tasks:	Women	Men	Girls	Boys
AK4.1	Land Preparation				
AK4.2	Seeding/planting				
AK4.3	Weeding/spraying				
AK4.4	Fertilizing				
AK4.5	Harvesting				
AK4.6	Marketing				
AK4.7	Animal care				
AK4.8	Fishing				
AK5	If villagers cultivate land in Dambo areas, fill in the following:	1996	1997		
AK5.1	Number of farm families				
AK5.2	Average Dambo landholding size				
AK5.3	Area cultivated				
AK5.4	Yield/ha				
AK6	If villagers have access to irrigated land, fill the following:				
AK6.1	Name of scheme				
AK6.2	Source of water	1) River / Stream			
AK6.3		2) Lake			
AK6.4		3) Groundwater			
AK6.5		4) Other:			
AK6.6	Means of water conveyance (delivery):	1) Open channels			
AK6.7		2) Piped system			
AK6.8		3) Other:			
AK6.9	Main Crops under irrigation				
AK6.10					
AK6.11					
AK6.12	Number of farmers in the scheme	Male			
AK6.13		Female			
AK6.14	Average landholding size under irrigation (in ha):				
AK6.15	Total command area under irrigation (in ha):				

Table VL16: Business Establishment in the Village

AL1	Business in the village	
AL1.1	Name of Business	
AL1.2	Name of owner	Male
AL1.3		Female
AL1.4	HQs or branch establishment	
AL1.5	Type of ownership (Indicate whether single proprietor, Cooperative, Partnership, Limited company, etc.):	
AL1.6	Type of business (Indicate whether industrial, Commerce and Trade, Construction, Banking and Finance, Agriculture and Livestock, Services, etc.)	
AL1.7	Capital investment	
AL1.8	Type of product	
AL1.9	Total cost of production for last 12 months	
AL1.10	Annual sales	
AL1.11	Number of employees	Male
AL1.12		Female
AL2	Estimate the number of (semi) skilled labourers in the village:	
	Occupation	Number of people
AL2.1	Carpenter	
AL2.2	Tin smith	
AL2.3	Mason	
AL2.4	Welder	
AL2.5	Woodcarver Etc.	
AL2.6	Other (specify):	
AL2.7		
AL2.8		
AL2.9		

Table VL17: Employment and Place of Work

AM	Main occupation	% of HH	Time of walking in minutes to place of work	
			Dry Season	Wet Season
AM1.1	Farming			
AM1.2	Fishing			
AM1.3	Dairy/Cattle farming			
AM1.4	Farming Labour			
AM1.5	Factory Labour			
AM1.6	Handicraft			
AM1.7	Other (Specify)			
AM1.8				
AM1.9				

Table VL18: Markets

To which markets do the villagers go to buy and to sell?

Name Market Place (1):				in Village:		
AN1	Market for	Buying	Selling	Type of Market		
AN1.1	Cash crops			AN1.14	Private Trading place	
AN1.2	Vegetables			AN1.15	ADMARC Market	
AN1.3	Fish/meat			AN1.16	Council Market	
AN1.4	Household Utensils					
AN1.5	Clothing					
AN1.6	Farm Tools				Distance	Season
AN1.7	Pesticides				(Minutes)	Dry Wet
AN1.8	Fertilizer			AN1.17	on foot	
AN1.9	Seeds			AN1.18	by bicycle	
AN1.10	Constr.Tools			AN1.19	by oxcart	
AN1.11	Constr.Materials			AN1.20	by motor vehicle	
AN1.12	Other:.....			AN1.21	Other:	
AN1.13	Other:.....			AN1.22	Other:	

Name Market Place

(2..3..etc)

Table VL19: Main Sources of Fuel and Energy

AO	Type of	Use of Fuel			Give proportion (in %) for the HH is	Travel time in hours to nearest source:			MoT ²	Who ³
		Cook	Heat	Light		Dry S.	Wet S.	Trips/ week		
AO1.1	Fire wood			%	%					
AO1.2	Paraffin			%	%					
AO1.3	Charcoal			%	%					
AO1.4	Briquettes			%	%					
AO1.5	Electricity			%	%					
AO1.6	Gas			%	%					
AO1.7	Dried Dung			%	%					
AO1.8				%	%					
AO1.9				%	%					
AO1.10				%	%					

NB:	Source¹	Code	MoT²:	Code	Who³	Code
	Shop		Headloading		Women	
	Market		Bicycle (trailer)		Girls	
	Woodlot		Animal cart		Men	
	Forest		Hand cart		Boys	
	Garden		Wheelbarrow			
	Trader		Pick-up / truck			
			Other public transport			
			Other:			

Table VL20: Means of Transport in the Village

Ownership of Means of Transport in the Village

AP	Type	Number of MoT	
		Total	Not Working
AP1.1	Bicycle ambulance		
AP1.2	Bicycle trailer:		
AP1.3	Bicycle:		
AP1.4	Tricycle		
AP1.5	Oxen:		
AP1.6	Ox cart:		
AP1.7	Ox sledge:		
AP1.8	Donkey:		
AP1.9	Donkey cart:		
AP1.10	Donkey sledge:		
AP1.11	Handcart:		
AP1.12	Wheelbarrow:		
AP1.13	Motor cycle:		
AP1.14	Car/pick up:		
AP1.15	Mini bus:		
AP1.16	Bus:		
AP1.17	Truck:		
AP1.18	Tractor:		
AP1.19	Tractor trailer:		
AP1.20	Boat with inboard motor		
AP1.21	Boat with outboard motor		
AP1.22	Boat without motor		
AP1.23	(Other:):.....		
AP1.24			
AP1.25			

AM2 Transport and communications issues that affect development in the village.

Table VL21: Social-Administrative Services

AQ	Type of service	Travel time in minutes	Frequency of visit / month	Major type of Transport to place
AQ1.1	Bank			
AQ1.2	Council			
AQ1.3	NGO's			
AQ1.4	Police			
AQ1.5	Post Office			
AQ1.6	Registrar			
AQ1.7	Tax Office			
AQ1.8	Church			
AQ1.9	Political offices			
AQ1.10	Other (specify)			
AQ1.11				
AQ1.12				
AQ1.13				
AQ1.14				
AQ1.15				
AQ1.16				

Table VL22: Infrastructure and Transport

AR1	Does the Village have direct access to a motorable road ?	Tick appropriate answer		
AR1.1	Yes, all year round			
AR1.2	Yes, but only in the dry season			
AR1.3	No, Vehicles not reach the village			

AR2	Distance to Nearest:	Season		Name Village/Town
		Dry	Wet	
AR2.1	Road			
AR2.2	Railway station (in operation):			
AR2.3	Transport Service by road:			
AR2.4	Boat service:			
AR2.5	Other (specify)			
AR2.6				
AR2.7				

AR3	Transport Service used:	Frequency of service (daily/weekly)	
		Dry Season	Wet Season
AR3.1	Bus		
AR3.2	Matola		
AR3.3	Boat		
AR3.4	Train		
AR3.5	Other (specify)		
AR3.6			
AR3.7			

AR4	Condition of the most important footpaths and tracks in and around the village	
	Accessibility in Wet Season:	Tick appropriate answer
AR4.1	No problem on foot and by bicycles	
AR4.2	No problem on foot, difficult for bicycles	
AR4.3	Problematic on foot, impassable by bicycles	
	Accessibility in Dry Season:	Tick appropriate answer
AR4.4	No problem on foot and by bicycles	
AR4.5	No problem on foot, difficult for bicycles	
AR4.6	Problematic on foot, impassable by bicycles	

AR5	Condition of water crossings in and around the village	
		Tick appropriate answer
AR5.1	Very problematic	
AR5.2	Problematic	
AR5.3	Sometimes problematic	
AR5.4	No problems	

Table VL23: Access Problems & Priorities

1. Show all drawings (with pictures of “sectors”)
2. Ask to select 3 sectors with greatest access problems
3. Show 3 selected sectors again
4. Ask to rank these three in order of importance
5. Confirm the choice

1 = Greatest problem
2 = Second greatest problem
3 = Third greatest problem

Access problem in sector:	Problem Ranking	The Access problem relates to (*): Distance Number Quality Infrastr. Mobility
Drinking Water		
Health Service		
Education		
Cooking Fuel		
Markets		
Gardens (farm land)		
Grinding Mill, etc.		
Public Transport Services		
Farm Inputs		
Road Network		
Credit		

Give points for the most effective intervention to solve the 3 above-mentioned problems ?

3 points = Reducing all 3 access problems
 2 points = Reducing 2 access problems
 1 point = Reducing 1 access problem

Intervention:	Points:
Improve/construct	Footpaths
Improve/construct	Access Roads
Improve/construct	Bridges
Improve/construct	Boreholes
Build new	Health Centre
Improve quality of	Health Centre
Build new	School
Improve quality of	Education
Establish new	Market place
Establish new	Wood lot
Establish new	Transport service
Establish new	Grinding Mill
Making available	IMTs
Other:	
Other:	

Annex 3

Examples of Mapping

The following maps are prepared as an example:

- ❖ Sheet 1: Villages, VDC boundaries and the locations of the health facilities.
- ❖ Sheet 2: The 5 kilometre catchment areas and the “60 minute line”.
- ❖ Sheet 3: The actual catchment areas of the health facilities.
- ❖ Sheet 4: The Household numbers of the villages

The *analysis* results lead to the following conclusions:

- ❖ The VDCs 3, 4 and 5 do have an accessibility problem in the health sector.
- ❖ The average travel time to reach a health facility is the highest in VDC 3 and 4.
- ❖ VDC 5 has the highest number of people travelling to Health Centres, spending more than one hour on a single trip.
- ❖ The catchment areas of the HCs in VDC 1 and 4 are greater than was intended in the planning of the health centres.

When looking at the *maps* the following can be concluded:

1. The 5 kilometre catchment and 60 minutes do not coincide for the Health Centre in VDC 4 and the Clinic in VDC 5; in other words people travel slower in these areas than in VDC 1 and 2. As it happens VDC 3, 4 and 5 are more “hilly” than VDC 1 and 2 and people complain about the state of the footpaths.
2. Combining sheet 1, 2 and 4 shows that only the people (420 HH) of the village where the HC in VDC 4 is located have access to the

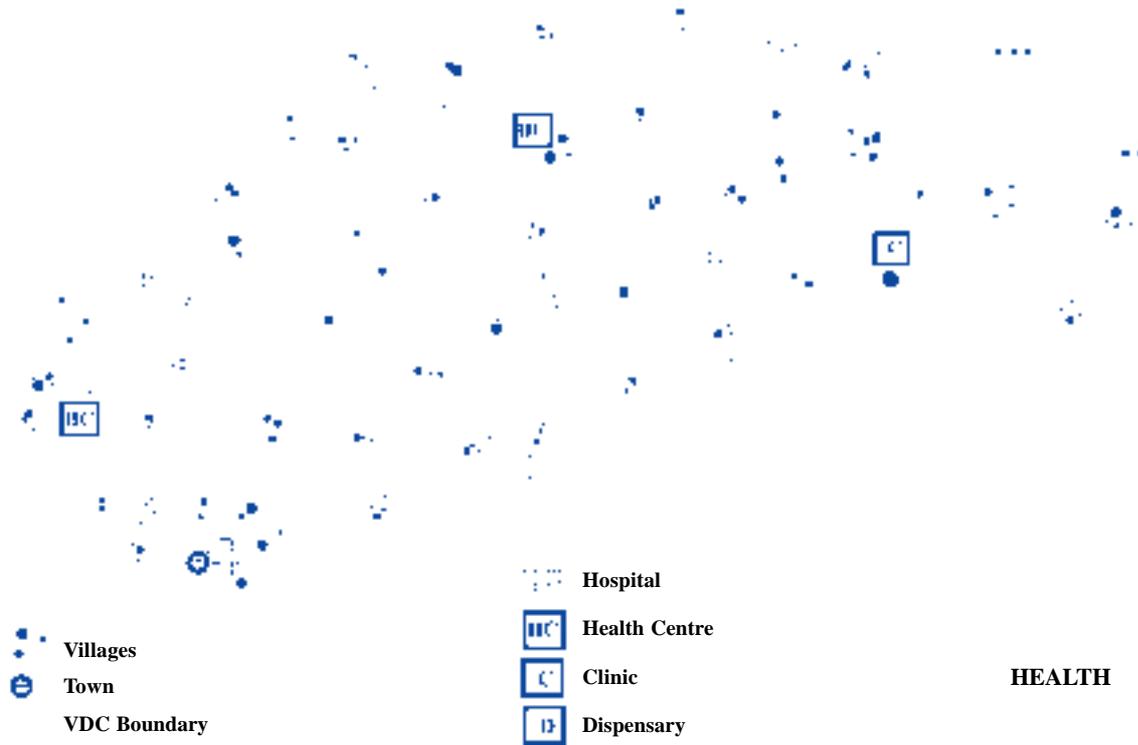
HC within one hour. If one looks at the “designed” catchment area of 5 km radius the total HH included in this area is about 1400 households. The design assumed that by locating a HC in this particular spot, about 7000 people would have access to health services within one hour. The map clearly shows this is not the case.

3. Combining sheet 1, 3 and 4 show that the catchments of all Health facilities are much greater than assumed and that some villages use more than one facility: the catchment areas overlap. The catchment area of the HC in VDC 4 totally overlaps the catchment of the Clinic in VDC 5. Conclusion: the people sometimes need to have access to health services in the HC that are not provided by the clinic.
4. Overlapping catchment areas often point to certain shortcomings in service or medication provision. When the catchment of a hospital overlaps the catchment of a Health Centre that is to be expected, but when catchments of two HCs overlap, then there must be a specific reason why people travel longer distances to reach health services than necessary. The planner should then look at the infrastructure to access the health facilities and the quality of service. In the case of the Clinic in VDC 5 it is justified to propose to upgrade the clinic to a health centre. This will probably improve the access to health for many villages in VDC 4 and 5. If the clinic is upgraded to a HC the catchment area of the HC in VDC 4 will be reduced and thus also the pressure on this facility; possibly a reason why people sometimes go to the health centre in VDC 1.

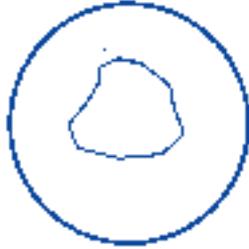
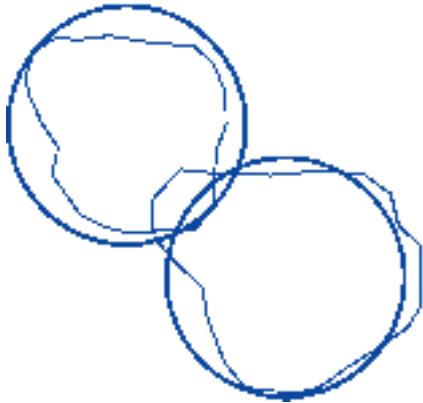
The above are just a few examples of what mapping can visualise. Combining health with other maps like roads, education, water points, etc, will probably lead to more conclusions or questions to be verified. It will definitely assist the planner to find integrated solutions to access problems, which otherwise will remain unseen.

Sheet 1: Location of Health Facilities

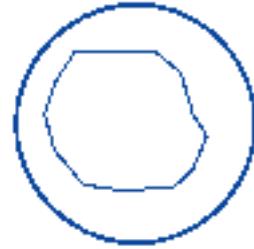
Location of Health Facilities



Sheet 2: Catchment Areas



Catchment Areas

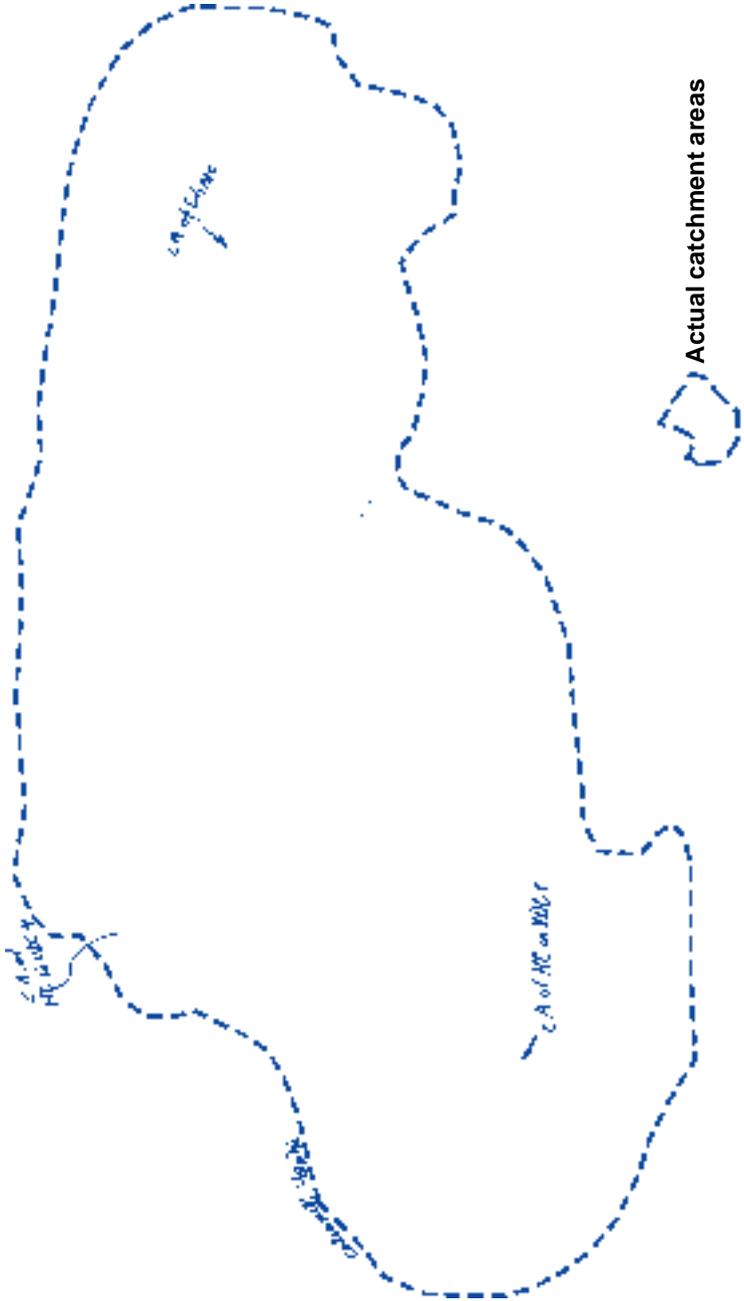


5 kilometre radius

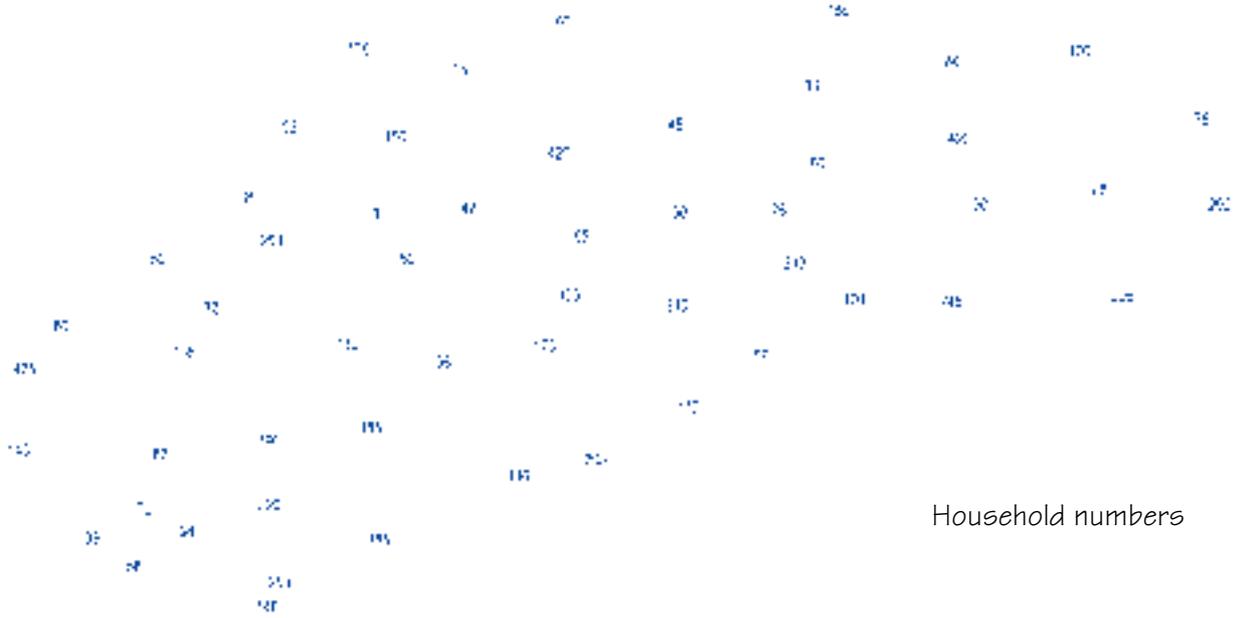


60 minutes radius

Sheet 3: Actual Catchment Areas



Sheet 4: Household Numbers



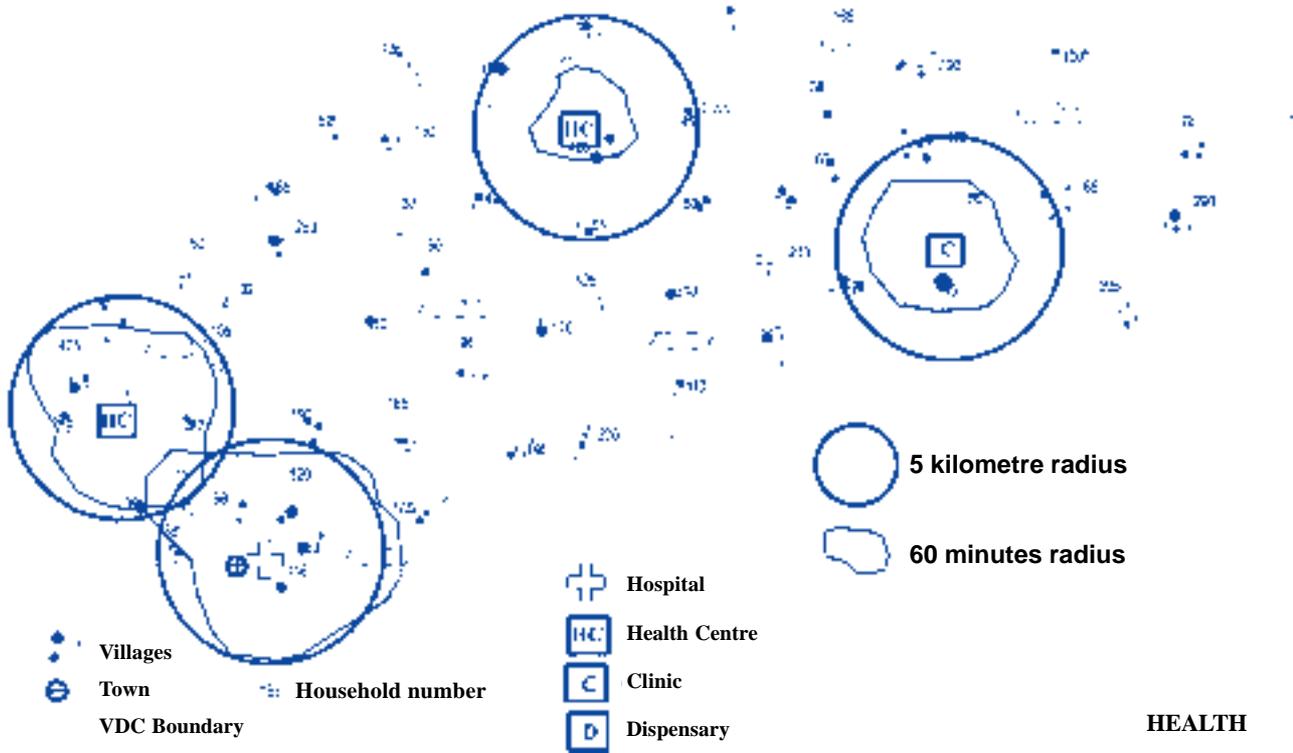
Household numbers

 Household number

Sheets 1, 2 and 4

Household numbers

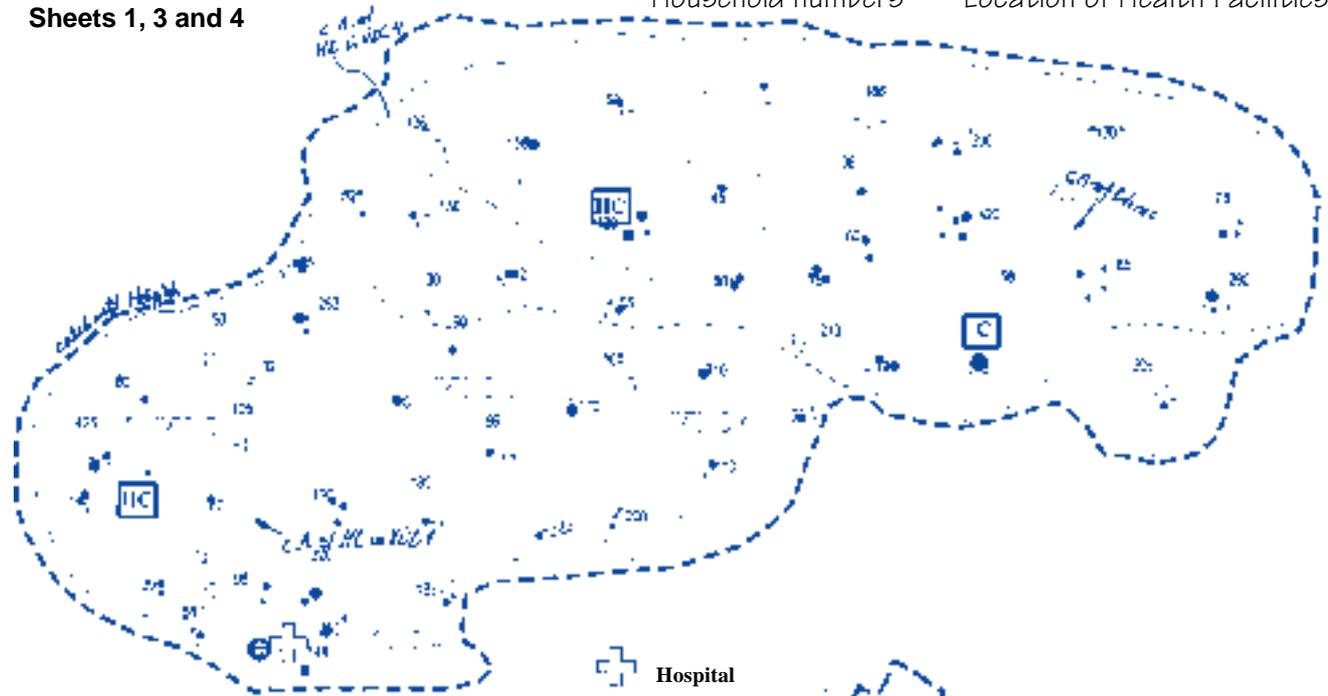
Location of Health Facilities
Catchment Areas



Sheets 1, 3 and 4

Household numbers

Location of Health Facilities



- Villages
- Town
- VDC Boundary
- Household number

- Hospital
- Health Centre
- Clinic
- Dispensary

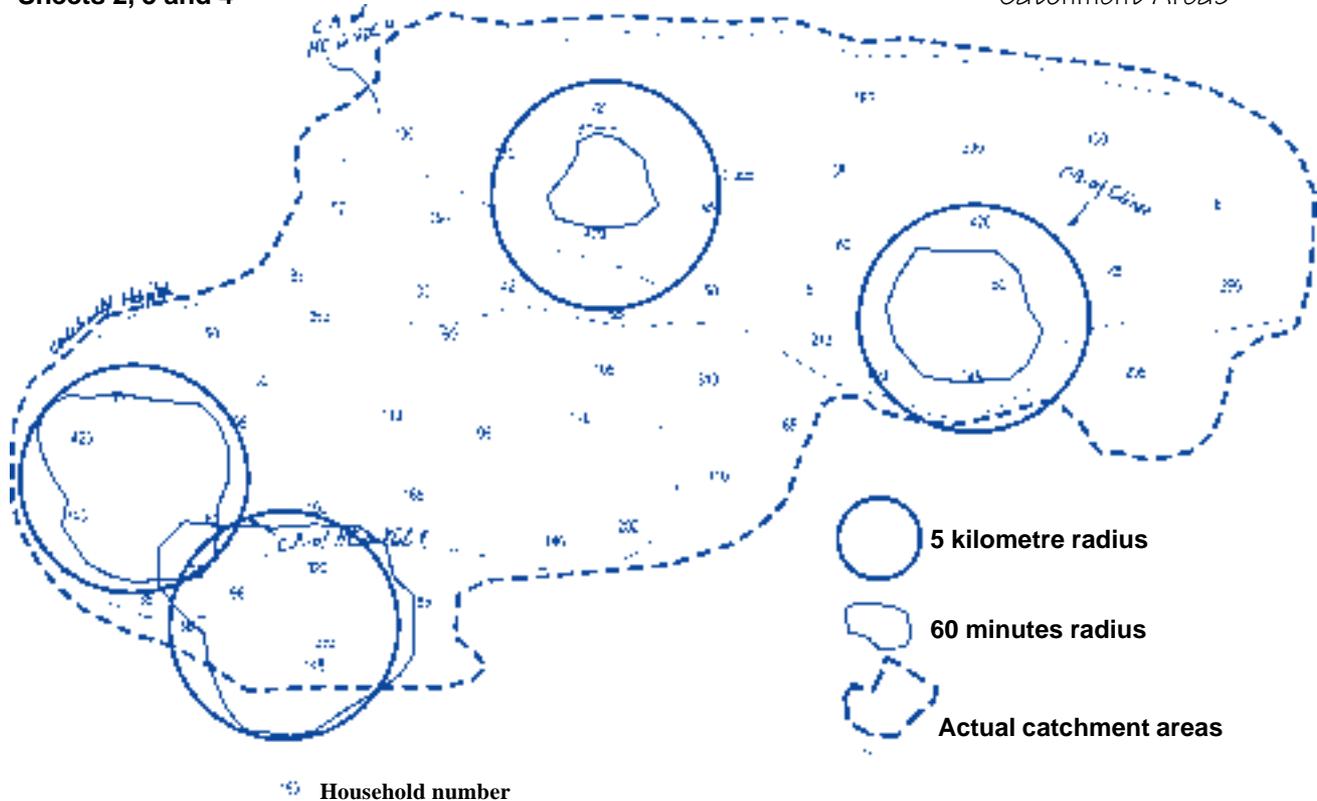
Actual catchment areas

HEALTH

Sheets 2, 3 and 4

Household numbers

Catchment Areas



Notes on Access Profiles

Area accessibility profiles (ADC)

- ⇒ Accessibility situation per sector of villages, VDCs and ADC (in Tables and graphs)
- ⇒ Summary of the Access Situation in the ADC (descriptive)
- ⇒ Attach Accessibility Maps per sector and overlays of combinations
- ⇒ Priorities in interventions
- ⇒ Projects in preparation

1 Accessibility Situation per Sector:

General characteristics:

ADC information:

- ◆ Number of VDCs in the ADC:
- ◆ Number of Villages in the ADC:
- ◆ Total number of HH in the ADC:
- ◆ Average number of HH per VDC:
- ◆ Average number of HH per Village:
- ◆ Average number of people per HH in the ADC:
- ◆ Average distance to the village centres in the ADC:

VDC & Village information:

Table with Village characteristics:

VDC	Village	HH	Population n	FHH	% FHH	Nos. Settlement	Average distance to Centre	People /HH
1	A	***	****	**	* %	**	*** (min)	**
	B	***	****	**	* %	**	*** (min)	**
2	C	***	****	**	* %	**	*** (min)	**

Continuation Village table:

VDC	Village	Settlement	HH	Av. Dist to Centre
1	A	a	***	*** (min)
		b	***	*** (min)
	B	c	***	*** (min)
2	C	d	***	*** (min)

Table with VDC characteristics:

VDC	Nos of Villages	Nos of HH	Population	FHH	% FHH
1	**	***	****	**	*%
2	**	***	****	**	*%
3	**	***	****	**	*%

Transport infrastructure:

ADC information:

- ❖ Percentage of Villages with all year access to motorable road
- ❖ Percentage of Villages with dry season only access to motorable road
- ❖ Percentage of Villages between 15 and 30 min to all year motorable road.
- ❖ Percentage of Villages between 30 and 60 min to all year motorable road.
- ❖ Percentage of Villages between 1 and 2 hours to all year motorable road.
- ❖ Percentage of Villages between 2 and 3 hours to all year motorable road.
- ❖ Percentage of Villages over 3 hours distance to all year motorable road.

VDC & Village information Transport Infrastructure:

Motorable Road:

VDC	Village	HH	Village Name nearest road	Travel Time	Access Indicator (A1)	Type Connection Route	Condition of that Road
1	A	***	D	** min	**	footpath	all year
	B	***	D	** min	**	track	all year
	D	***	D	** min	**	footpath	dry only
2	C	***	G	** min	**	footpath	all year

Access to Motorable Road per VDC:

VDC	HH	Average Travel Time	Access Indicator (AI)
1	***	** min	**
2	***	** min	**
3	***	** min	**
4	***	** min	**

% of HH with access to Motorable Road within X min:

VDC	<15 min	15-30 min	30-60 min	1-2 hours	2-3 hours	>3 hours
1	**	**	**	**	**	**
2	**	**	**	**	**	**
3	**	**	**	**	**	**
4	**	**	**	**	**	**

List of Village Access Footpaths:

VDC	Village (from)	Village (to)	Travel distance (min)	Number of Water Crossings	Condition of Footpath
1	A	B	**	**	all year
		D	**	**	all year
		K	**	**	dry only
	B	D	**	**	allyear

Transport Services:

ADC information:

- ❖ Percentage of Villages with all year Public Transport Service
- ❖ Percentage of Villages with dry season only Public Transport Service
- ❖ Percentage of Households between 15 and 30 min to all year Public Transport Service
- ❖ Percentage of Households between 30 and 60 min to all year Public Transport Service.
- ❖ Percentage of Households between 1 and 2 hours to all year Public Transport Service.
- ❖ Percentage of Households between 2 and 3 hours to all year Public Transport Service.
- ❖ Percentage of Households over 3 hours distance to all year Public Transport Service.
- ❖ Type of transport service, costs and frequency in the ADC.

VDC & Village Information:

Access to nearest Public Transport Service:

VDC	Village	HH	Walking Distance	Type Service	Wet Season	From	To	Freq	Fare (single)
1	A	***	***	Bus	Y/N	A	L	2/day	2 K
	B	***	***	Matola	Y/N	A	L	5/day	5 K
	D	***	***	Train	Y/N	C	M	2/wk	10 K
2	C	***	***	Boat	Y/N	C	K	1/day	30 K

Village with Transport Service only in dry season:

Village	HH	Average Travel Time	Access Ind. (AI)
A	***	** min	**
B	***	** min	**
D	***	** min	**
K	***	** min	**

Village with Transport Service all year:

Village	HH	Average Travel Time	Access Ind. (AI)
C	***	** min	**
E	***	** min	**
F	***	** min	**
G	***	** min	**

% of HH with access to Public Transport within X min:

VDC	<15 min	15-30 min	30-60 min	1-2 hours	2-3 hours	>3 hours
1	**	**	**	**	**	**
2	**	**	**	**	**	**
3	**	**	**	**	**	**
4	**	**	**	**	**	**

Average Frequency of Service per VDC:

VDC	>5/day	5-2/day	1/day	2/week	1/week	<1/week
1	X					
2		X				
3	X					
4				X		

Means of Transport:

ADC Information:

Type of MoT per ADC:

MoT Type	Total Nos of MoT	Total MoT <i>not</i> working	Total MoT working	Number of MoT per 1000 HH
Bicycle	***	**	**	**
Oxcart	***	**	**	**
Wheelbarrow.	***	**	**	**
Motor car	***	**	**	**

Ranking VDCs in terms of available MoT per 100 HH:

VDC	HH	Total MoT working	HH/IMT	Nos of MoT per 100 HH
1	***	**	**	**
2	***	**	**	**
3	***	**	**	**
4	***	**	**	**

VDC & Village Information:

Availability of Means of Transport (MoT):

VDC	Village	HH	Total MoT	Total MoT	Total MoT	HH/IMT
1	A	***	***	***	***	***
	B	***	***	***	***	***
	D	***	***	***	***	***
2	C	***	***	***	***	***

Means of Transport per Village, ranked by HH/IMT:

Village	HH	Total MoT working	HH/IMT
A	***	**	**
B	***	**	**
D	***	**	**
K	***	**	**

Type of MoT per VDC:

VDC	HH	MoT Type	Total Nos of MoT	Total MoT <i>not</i> working	Total MoT working	HH/MoT
1	***	Bicycle	***	**	**	**
	***	Oxcart	***	**	**	**
	***	Wheelbarrow.	***	**	**	**
2	***	Bicycle	***	**	**	**

Breakdown per Type of MoT per VDC: (Bicycles, oxcarts, etc.)

VDC	HH	Total Bicycles working	HH/Bicycle	Working Bicycles per 100 HH
1	***	**	**	**
	***	**	**	**
	***	**	**	**
2	***	**	**	**

Drinking Water Supply:

ADC information:

ADC Averages:

- ◆ Percentage of Households which have no access to *Protected WS* in their village
- ◆ Percentage of Households which have only seasonal access to *Protected WS* in their village
- ◆ Percentage of Households which have all year access to *Protected WS* in their village
- ◆ Number of perennial working Protected Water Supply Points & Number of HH per perennial PWSP
- ◆ Number of seasonal Protected Water Supply Points
- ◆ Number of HH per perennial & seasonal PWSP
- ◆ Average Travel Time to collect water in Dry season
- ◆ Average Travel Time to collect water in Wet season
- ◆ Average Queuing Time at PWSP in Dry season
- ◆ Average Queuing Time at PWSP in Wet season

Responsibility for Water Collection per ADC (%):

ADC	W	Ch	M	W&Ch	W&M	M&Ch	W&CH&M	Total
-	***	***	***	***	***	***	***	100 %

(W = Women, M = Men, Ch = Children)

VDC & Village information:

Protected Water Supply Points per Village:

VDC	Village	HH	Total PWSP in the village	PWSP Working perennial	PWSP Working only seasonal	PWSP Broken
1	A	***	***	***	***	***
	B	***	***	***	***	***
	D	***	***	***	***	***
2	C	***	***	***	***	***

Responsibility for Water Collection per VDC (%):

VDC	W	Ch	M	W&Ch	W&M	M&Ch	W&CH&M	Total
1	***	***	***	***	***	***	***	100 %
2	***	***	***	***	***	***	***	100 %
3	***	***	***	***	***	***	***	100 %
4	***	***	***	***	***	***	***	100 %

Frequency of Water Collection per VDC:

In Dry Season:

In Wet Season:

VDC	Village average per day	VDC	Village average per day
1	***	1	***
2	***	2	***
3	***	3	***
4	***	4	***

Villages *without* Protected Water Supply Points in the Village:

VDC	Village	HH	TT (in min) on foot	Access Indicator (AI) (HH*TT)
1	A	***	***	***
	B	***	***	***
	D	***	***	***
2	C	***	***	***

Rank above Villages by AI

Villages with *Seasonal Working* Protected Water Supply point(s) in the Village:

VDC	Village	HH	TT (in min) on foot	Average QT (in min) at PWSP	(AI _{TT}) (HH*TT)	(AI _{QT}) (HH*QT)
1	A	***	***	***	***	***
	B	***	***	***	***	***
	D	***	***	***	***	***
2	C	***	***	***	***	***

Rank above Villages by AI_{TT} and by AI_{QT}

Average per VDC:

- ❖ Percentage of Households which have no access to *Protected WS* in their village
- ❖ Percentage of Households which have only seasonal access to *Protected WS* in their village
- ❖ Percentage of Households which have all year access to *Protected WS* in their village
- ❖ Number of perennial working Protected Water Supply Points & Number of HH per perennial PWSP
- ❖ Number of seasonal Protected Water Supply Points
- ❖ Number of HH per perennial & seasonal PWSP
- ❖ Average Travel Time to collect water in Dry season
- ❖ Average Travel Time to collect water in Wet season
- ❖ Average Queuing Time at PWSP in Dry season
- ❖ Average Queuing Time at PWSP in Wet season

Primary Education:

ADC Information:

Access to schools per VDC:

VDC	Nos of Schools				Mode of Transport			Reason for absence				
	HH	J	F	AI	foot	bike	publ. tr.	cart	Road	work	hunger	other
1												
2												

ADC Averages:

- ❖ Number and % of Villages with Full Primary school
- ❖ Number and % of Villages with Junior Primary school
- ❖ Number and % of Villages with Junior Primary school
- ❖ Percentage of Households which have no access to *any primary school* in their village
- ❖ Average Travel Time to reach primary school
- ❖ Percentage of children travelling more than 30 min, 60 min, 90 min, 120 min.
- ❖ Total nos. of schools, HH/school-ratio

VDC & Village Information:

VDC	Village	HH	Nos of schools in the village		Travel Time by foot (min)		
			Junior Primary	Full Primary	Junior Primary	Full Primary	A.I. (HH*TT)
1	A	***	***	***	***	***	***
	B	***	***	***	***	***	***
2	D	***	***	***	***	***	***

Ranked Villages by their Access Indicator:

Village	VDC	HH	TT	A.I.
B	1	***	***	***
D	1	***	***	***

Catchment of Junior Primary Schools:

Name school	Location (village)	Catchment (HH)	<30	Range of Travel Time (min)			
				30-60	60-90	90-120	>120
aaa	A	**	%	%	%	%	%
bbb	G	**	%	%	%	%	%

Catchment of Full Primary Schools:

Name school	Location (village)	Catchment (HH)	<30	Range of Travel Time (min)			
				30-60	60-90	90-120	>120
aaa	A	**	%	%	%	%	%
bbb	G	**	%	%	%	%	%

Additional secondary information on No of classrooms, -teachers, pupil/teacher ratio, enrolment, dropout, nos. of chairs, teaching equipment, etc. is also required.

Health:

ADC Information:

Access to health facilities per VDC:

VDC	HH	TTav	AI	Mode of transport (%)			
				foot	bike	car	bus
1	**	**	**	%	%	%	%
2	**	**	**	%	%	%	%

VDC	HH	TTav	AI	Range of travel time (hrs)					
				<1	1-2	2-3	3-4	4-5	>5
1	**	**	**	% HH	% HH	% HH	% HH	% HH	% HH
2	**	**	**	% HH	% HH	% HH	% HH	% HH	% HH

ADC Averages:

- ❖ Number and Percentage of Village with Health Facility
- ❖ Ratio: Households / Health Centre
- ❖ Average TT to Health
- ❖ Average Actual catchment of Health Facilities in the ADC

VDC & Village Information:

VDC	Village	HH	TTav	TTmin	TTmax	AI
1	A	**	**	**	**	**
	B	**	**	**	**	**
2	D	**	**	**	**	**
	G	**	**	**	**	**

Rank Village by AI to Health:

Village	VDC	TTav	AI
D	1	**	**
H	1	**	**
A	2	**	**
C	3	**	**

Health Facilities in the District

Name Health Facility	Type of Health F.	in ADC	Location Name	Catchment Area		
				ADC	Village	Av. TT
GGGG	HC	K	A	K	A	**
					F	**
					H	**
				G	B	**
					C	**
ZZZZZ	H	J	S	X	L	**
					N	**

For District Profile:

Range of TT to Health Facilities per ADC:

ADC	Travel Time (single trip) in hours:					
	<1	1-2	2-3	3-4	4-5	>5
Kapuka	** %	** %	** %	** %	** %	** %
Kasumbu	** %	** %	** %	** %	** %	** %
Pemba	** %	** %	** %	** %	** %	** %

Crop Production:

ADC Information:

Distance to Farmland per VDC:

Village	VDC	TTav	AI
1	**	**	**
2	**	**	**

Mode of Transport for Crop Marketing:

Mode of Transport							
Crops	HH	TTav	AI	Bicycle	cart	Mcar	Publ Trans.
Maize	**	**	**	% Villages	% Villages	% Villages	% Villages
Beans	**	**	**	% Villages	% Villages	% Villages	% Villages
**	**	**	**	% Villages	% Villages	% Villages	% Villages

ADC Averages:

- ❖ Number and Percentage of village growing maize for domestic use
- ❖ Number and Percentage of village growing maize as Cash Crop
- ❖ Number and Percentage of village growing maize for both domestic use and as Cash Crop
- ❖ ..Same for other crops

VDC & Village Information:

Distance to Farm land per Village:

VDC	Village	HH	TTav	AI
1	A	**	**	**
	B	**	**	**
2	D	**	**	**
	G	**	**	**

Rank village by AI to farm land:

Village	VDC	TTav	AI
D	1	**	**
H	1	**	**
A	2	**	**
C	3	**	**

Use and Marketing of Crops per Village:

VDC	Village	HH	Crops	Use	Market	Where?
1	A	**	Maize	Domest.	Private	—
	B	**	Beans	Cash	Admarc	A
2	D	**	etc.	Both	etc.	A
	G	**	etc.	etc.	etc.	etc.

MAIZE GRINDING

ADC Information:

Access to Grinding Mills per VDC:

VDC	HH	TTav	AI
1	**	**	**
2	**	**	**
ADC	**	**	**

Frequency of Travel to Grinding Mill per VDC:

VDC	HH	Freq. /month
1	**	**
2	**	**
ADC	**	**

Mode of Transport to Grinding Mill per ADC:

Mode	HH
Foot	**
Bicycle	**
Bus	**
Oxcart	**
etc.	**

ADC Averages:

- ❖ Number of villages with Grinding Mills
- ❖ Ratio: Households / Grinding Mills
- ❖ Average TT to Grinding Mills
- ❖ Average Actual catchment of Grinding Mills in the ADC

VDC & Village Information:

Accessibility to Grinding Mill per Village:

VDC	Village	HH	TT _{av}	TT _{min}	TT _{max}	AI
1	A	**	**	**	**	**
	B	**	**	**	**	**
2	D	**	**	**	**	**
	G	**	**	**	**	**

Rank Village by AI to Grinding Mill:

Village	VDC	TT _{av}	AI
D	1	**	**
H	1	**	**
A	2	**	**
C	3	**	**

Catchment of Grinding Mills:

Location of Grinding Mill	Type	Village	Catchment			
			HH _{vil}	TTav	QTav	Price
GGGG	Diesel	A	**	**	**	**
		F	**	**	**	**
		H	**	**	**	**
		B	**	**	**	**
		C	**	**	**	**
ZZZZZ	Electric	L	**	**	**	**
		N	**	**	**	**

Summary of Catchments per Grinding Mill:

Location of Grinding Mill	Type	HH _{catchm.}	QT _{av}	Range QT _{av}	Price	Range Price
GGGG	Diesel	**	**	**_**	**	**_**
		**	**	**_**	**	**_**
		**	**	**_**	**	**_**
		**	**	**_**	**	**_**
		**	**	**_**	**	**_**
ZZZZZ	Electric	**	**	**_**	**	**_**

Social & Economic Services:

ADC Information:

Trips to Social & Economic Services (VDC Averages):

VDC	Sum HH	TT _{weight}	AI
1	**	**	**
2	**	**	**
3	**	**	**
4	**	**	**
ADC	Sum HH	TT _{weight}	AI
&	**	**	**

Mode of Transport to Grinding Mill per ADC:

Mode	HH	% HH
Foot	**	**
Bicycle	**	**
Bus	**	**
Oxcart	**	**
etc.	**	**

VDC & Village Information:

Trips to Various Services per Village:

VDC	Village	HH	Service	Place	TT	Freq/ week	Freq/ month	Freq/ year	Mode of Transport
1	A	**	Post Off	AC	**	1			**
			Bank	DC	**		1		**
			Tax Off	DC	**			2	**
	B	**	Trading C.	AC	**		2		**
			Bank	DC	**		1		**
			Post Off	AC	**	2			**
2	D	**	etc.	etc.	**	**	**	**	**
	G	**	etc.	etc.	**	**	**	**	**

Trips to Social & Economic Services (Village Averages):

VDC	Village	HH	TTav	AI
1	A	**	**	**
	B	**	**	**
2	D	**	**	**
	G	**	**	**

Energy:

ADC Information:

Trips to obtain Fuel (wood) (VDC Averages):

VDC	Sum HH	TT _{av}	AI
1	**	**	**
2	**	**	**
3	**	**	**
4	**	**	**
ADC	Sum HH	TT _{av}	AI
&	**	**	**

Type of main Fuel for domestic use (per VDC):

VDC	Firewood		Paraffin		Briquette		Charcoal		Electricity	
	HH	% HH	HH	% HH	HH	% HH	HH	% HH	HH	% HH
1	**	**	**	**	**	**	**	**	**	**
2	**	**	**	**	**	**	**	**	**	**
3	**	**	**	**	**	**	**	**	**	**
4	**	**	**	**	**	**	**	**	**	**
etc.	**	**	**	**	**	**	**	**	**	**

Responsible for Fuel Collection (per VDC):

VDC	W	Ch	M	W&Ch	W&M	M&Ch	W&CH&M	Total
1	***	***	***	***	***	***	***	100 %
2	***	***	***	***	***	***	***	100 %
3	***	***	***	***	***	***	***	100 %
4	***	***	***	***	***	***	***	100 %
ADC	***	***	***	***	***	***	***	100 %

Number of HH with Connection to Electricity Supply (per VDC):

VDC	HH total	HH connected	Cooking	Used for: Light/heating	Business
1	***	***	***	***	***
2	***	***	***	***	***
3	***	***	***	***	***
4	***	***	***	***	***
ADC	***	***	***	***	***

Catchments of Major Wood Supply Areas in the ADC:

Location	HH _{catchment}
Dedza Forest Reserve	**
Woodlot	**
Gardens	**
Private traders	**

VDC & Village Information:

Trips to Various Fuel Collection Points per Village:

VDC	Village	HH	Location	TT	Frequency	Mode of Transport
1	A	**	aa	**	**	**
			gg	**	**	**
	B	**	aa	**	**	**
			gg	**	**	**
2	D	**	dd	**	**	**

Average Travel Time to Fuel Collection Points per Village:

VDC	Village	HH	¹ TT _{weighted}	AI
1	A	**	**	**
	B	**	**	**
2	D	**	**	**

Ranked Villages by AI (in descending order):

Village	HH	TT _{weighted}	AI
C	**	**	**
D	**	**	**
A	**	**	**
B	**	**	**

Access Problems:

All Priorities

VDC	Village	1 st priority	2 nd priority	3 rd priority
1	A	WATER	SCHOOL	HEALTH
	B	SCHOOL	ROAD	FIREWOOD
	C	WATER	BRIDGE	SCHOOL
2	D	ROAD	GRIND. MILL	HEALTH
	E	WATER	SCHOOL	ADMARC
3	etc	etc.	etc.	etc.

Priorities per VDC

First Priorities:

VDC	Priority	No of Villages	Total HH	% of HH
1	WATER	2	**	**
	SCHOOL	1	**	**
2	ROAD	1	**	**
	WATER	1	**	**
etc.		**	**	**

Second Priority:

VDC	Priority	No of Villages	Total HH	% of HH
1	SCHOOL	1	**	**
	ROAD	1	**	**
2	BRIDGE	1	**	**
	GRIND. MILL	1	**	**
	SCHOOL	1	**	**

Third Priority:

VDC	Priority	No of Villages	Total HH	% of HH
1	HEALTH	1	**	**
	FIREWOOD	1	**	**
2	SCHOOL	1	**	**
	HEALTH	1	**	**
	ADMARC	1	**	**

List of Interventions Proposed per Village:

VDC	Village	Interventions proposed
1	A	Drill borehole construct school Tree nursery
	B	build road construct bridge drill borehole
	C	etc.
2	D	etc.

Footnote

¹ *TTweighted* = weighted average travel time using frequency as weighing factor