

**SEMINAR: SUSTAINABLE ACCESS
AND LOCAL RESOURCE SOLUTIONS**
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TITLE: Rural Accessibility and Mobility in Ntchisi District, Malawi,

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1. Introduction

The Rural Accessibility and Mobility Pilot Activity (RAMPA) is part of the Malawi Rural Transport & Travel Project, funded through a World Bank loan to the Government under the Ministry of Local Government. I.T. Transport of UK and the local consultant, Chapita provides consulting services to manage the assignment. Over the 18 month project period this included provision of a Civil Engineer as Team Leader, Road Engineer, Sociologist and Data Expert. Specialist expertise such as Geographical Information System (GIS) was provided by the Government Decentralisation Secretariat.

The aim of the pilot activity in Ntchisi district is to institutionalise Integrated Rural Accessibility Planning (IRAP) into the District Planning procedures, increase mobility through intermediate modes of transport (IMT) and pilot community contractors. This will then reduce one of the fundamental causes of rural poverty, namely isolation. The key tasks and initiatives within the project are:

- ❖ The collection and collation together with the District Authority of household mobility and accessibility data and the mapping of this data using a GIS.
- ❖ The planning and budgeting at the District level of targeted interventions to promote increased Mobility and Accessibility of rural households.
- ❖ The planning and implementation of initiatives to promote the use of Intermediate Modes of Transport (IMT).
- ❖ The training and use of local small scale contractors and local communities for infrastructure improvement and maintenance.
- ❖ The monitoring and evaluation of the whole project in terms of effectiveness, replicability and sustainability considering environmental, gender, HIV/AIDS and social exclusion issues.

The preparation of the District Development Plan (DDP) has five stages, namely:

1. Preparation of Socio Economic Profile
2. Needs Gap Analysis
3. Preparation of District Development Framework
4. Identification of Projects
5. Preparation of Investment Plan

The IRAP tool provides valuable data for the first two stages and thus provides a sound foundation for developing the District Plan. It helps in the compilation of data for the Socio Economic Profile including a GIS of all infrastructure in the district. The IRAP survey process then provides information on accessibility to this infrastructure which contributes to a Needs Gap Analysis of the District.

All sectors were covered in the project but for illustrative purposes this paper reviews the use of IRAP/GIS in education, markets, farm inputs, water, health and transport sectors in Ntchisi District. The paper than briefly touches upon the other components of the project namely development of Community Contractors for road improvements and promotion of IMTs.

2. Summary Profile of Ntchisi District

Ntchisi district is located in the Central Region of Malawi, 96 km north of Lilongwe, the capital city of Malawi. The total land area of the district is 1,655 sq km with a population of 212,000, giving a density of 128 persons per square kilometre. Ntchisi lies at an altitude of between 1,300 to 1,700 meters above the sea level. The eastern and north-eastern parts are hilly whereas the north, western and southern parts are generally flat. The mean annual temperature varies between 22 degrees Celsius in low altitude areas and 18 degrees Celsius in high altitude areas. Annual rainfall ranges from 900mm to 1,500mm. A road map of Malawi showing location of Ntchisi District is given in Annex 1.

Ntchisi District Assembly is a statutory body established under the Local Government Act (1998) Section 5.00 of the Laws of Malawi. It is supposed to be headed by the Chairperson selected from among the 26 councillors each representing a ward in the district. Since June 2005, the Assembly is run without elected members as their term of office ended in March 2005. The other members of the District Assembly include 7 Chiefs, 4 elected Members of Parliament and 5 Co-opted members. The District Commissioner is now the controlling officer of the Assembly and heads the Assembly Secretariat or District Executive Committee which is composed of Professional Heads of Government Sectors in the district.

The District is then divided into Area Development Committees (ADC) which are representative bodies of all Village Development Committees (VDC) under a Traditional Authority. Its membership could range from 25 to 60 under the leadership of the Chief. There are 7 ADCs in the district with a total population of 212,073 as shown in the table 1 below.

Table 1: Traditional Authorities, their VDCs & Villages

Traditional Authority	No. of VDCs	No. of Villages	Total Population
Chikho	31	165	18,073
Chilooko	41	338	68,227
Kalumo	55	349	46,044
Kasakula	45	267	20,471
Malenga	45	247	30,407
Nthondo	24	162	19,222
Vuso Jere	15	72	9,629
Totals	256	1,600	212,073

Agriculture forms around 80% of the district economy where 15% of cultivable land are estates producing mostly tobacco with the remainder small holder farms producing a range of crops such as maize, beans, groundnuts, potatoes and cassava. Livestock, forestry and irrigation are also important activities in the district. There is little private industry in the District and Government is by far the largest employer. According to "*Profile of Poverty in Malawi, 1998*" the poverty rate in the district was 76.3%.

3. Development of District Development Plan Using IRAP

3.1 Establishment of Databank

To prepare the Socio-Economic Profile of Ntchisi District three databases were set up. The first contained primary survey data collected using the IRAP method stored on Microsoft Access software. The second contained secondary data that the district authorities had collected on various sectors from a number of different sources stored in another MS Access file. Finally, information on the location of infrastructure was stored in the GIS, ArcView.

Primary data was collected during a physical survey conducted by Ntchisi District Assembly Staff including the Executive Committee, extension workers as well as school leavers who

had received training using the International Labour Organisation/ASIST Training Module. 25 Teams of 3 people (1 Committee member as supervisor, and 2 enumerators - 1 extension worker and 1 school leaver) collected the data. Participatory Rural Appraisals were conducted on the first day and the questionnaire the next. The data on households and villages was then collected from the 256 Village Development Committees (VDC). Information collected covered:

Section	Information
Part A: Administration	Details of VDC, villages, key informants and physical features such as terrain.
Part B: VDC Structure	Name of villages & details on: population structure (male/female, over 18/ under 18 years; household structure (number, female headed, child headed); and average distance to village.
Part C: Transport Infrastructure	Distances per village to nearest motorable road and nearest public transport stage; type of infrastructure connecting to motorable road; and most important tracks used by village within VDC.
Part D: Means of Transport	For each village, number of non-motorised means of transport per household such as oxen, donkey carts, hand-cart, wheelbarrow, bicycle, bicycle ambulance; and number of motorised means per household.
Part E: Transport Services	Motorised transport services available for VDC per village giving details such as: from/to; nearest stop; distance to nearest stop; one-way fare; frequency per week; and seasonal.
Part F: Energy	Type of fuel used by village details including: source & type of energy (generator, solar); distance to source; frequency of collection; who is responsible; number of households using means of transport; number of households use of electricity.
Part G: Water Supply	Water sources for VDCs by village: type (protected, unprotected well & springs, rivers, dams, boreholes, gravity schemes, piped by pump); and condition (bad taste, smell, not working, pumps little, periodic); number of households using source; travel time to source; queuing time; means of transport used; who is responsible; and frequency.
Part H: Health Facilities	By village type of facility details including: managed by location; accessibility - type of Rura; Transport Infrastructure (RTI), degree e.g. all year round, problems e.g. lack of water crossing); distance to facility; number of households using means of transport.
Part I: Education	List of education institutions in VDC children go to by village detailing: within/outside village; type of school; managed by; enrolment (female/male); accessibility (type of RTI, degree, problem); average distance; number of children using means of transport; reasons for dropping out of school e.g. hunger, child labour, menstruation, etc.
Part J: Farm Inputs	Farm inputs used by village detailing: type; source; accessibility (RTI, degree, problems); distances; means of transport.
Part K: Crop Production & Marketing	Main crops & livestock per village detailing: type; average distance to farm; amount used/sold; accessibility to type of market; distance; number of households using means of transport.
Part L: Maize Grinding	Grinding mills used by village detailing: type; condition; accessibility; who goes; distance; price per kg; number of households using means of transport.
Part N: Social And Economic Services	Type of socio-economic services available to each village detailing: type & location; accessibility (degree, problems); distance; number of households using means of transport; employment opportunities available by village detailing: type: farming, fishing, trading, etc.; number of people participating gender streamlined; average distance; number of people using transport means.
Part O: Main Access Problems	List three access problems in order of priority.

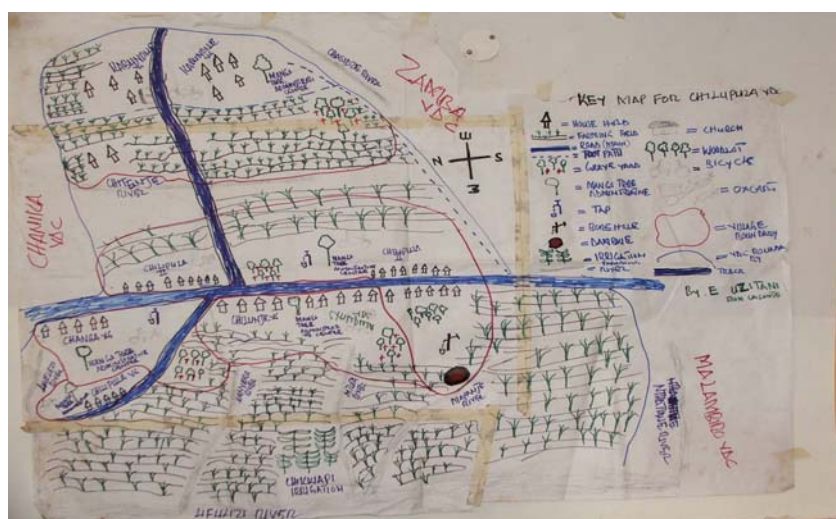
The secondary database covers every sector including information on:

- ❖ Land use
- ❖ Population
- ❖ Crop production
- ❖ Livestock
- ❖ Forestry
- ❖ Fishing
- ❖ Irrigation
- ❖ Extension work
- ❖ School enrolment
- ❖ Healthcare
- ❖ Electricity consumption
- ❖ Water availability
- ❖ Social problems such as practices likely to promote HIV/AIDS
- ❖ Policing
- ❖ Crime
- ❖ Prisons
- ❖ Roads & Bridges
- ❖ Public transport
- ❖ Employment
- ❖ Telecoms

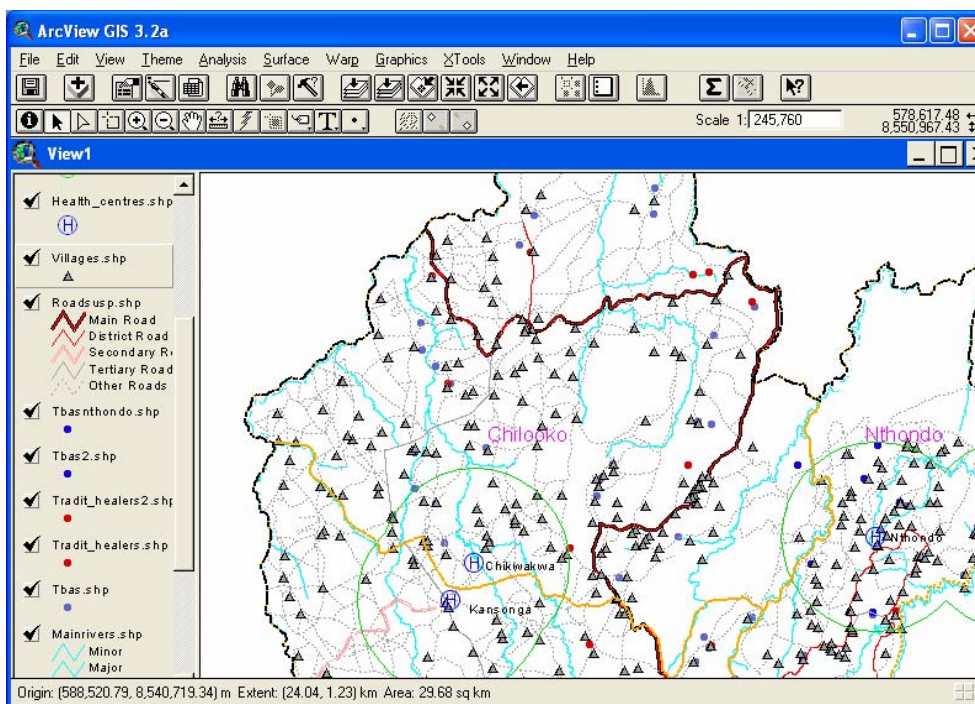
3.2 Establishment of Geographical Information System (GIS)

Malawi already has a national GIS that includes information on roads, rivers and contours for each district. The national information was then extracted for Ntchisi and supplemented with further details. The location of socio-economic facilities such as schools, wells, boreholes, and grinding mills were first identified by villagers who prepared an initial map, such as Map 1 shown below:

Map 1: Map Prepared by Villagers



A small team including the village headman on motorcycles then verified these facilities using a Global Positioning System (GPS). The coordinates and data were then entered into the Geographical Information System (ArcView). An example map that can be produced by the GIS, featuring health centres is given below:

Map 2: ArcView View of Villages and Health Facilities

The Malawi Government has a policy that every village should be within 5km of a health centre. It can be seen from the circles drawn above that many villages lie outside this 5km radius.

Lessons learned during the data collection exercise included:

- ❖ Get District Council staff to fully participate in surveys and questionnaires
- ❖ Provide a goat to feed the villagers
- ❖ Train & employ female school leavers since there are very few female extension workers
- ❖ Advance information in writing to the Group Village Headperson
- ❖ Involving Council Chairpersons is crucial for mobilisation of communities & success of the survey

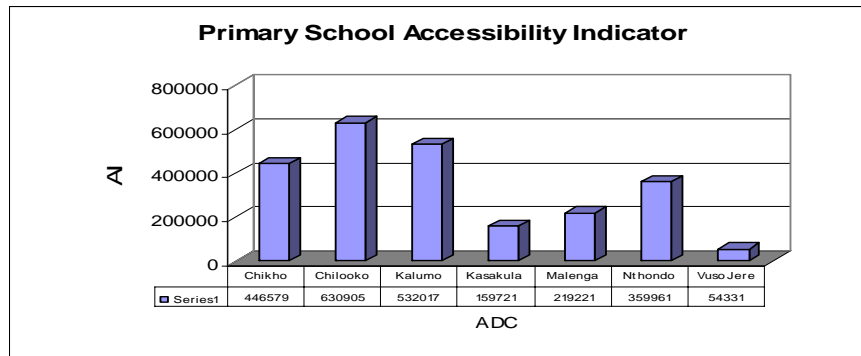
3.3 Identifying Demand for Services through the Accessibility Indicator

The basic formula for the Accessibility Indicator, $AI = \#HH \times TT$, where $\#HH$ = Number of Households seeking access to a specific service, and TT = Average Travel Time to reach a specific service.

EDUCATION

An example is given in Chart 1 below for primary school accessibility where the greatest demand is in Chilooko and Kalumo areas.

Chart 1: Primary School Accessibility



However, this does not give the full picture where it can be seen in Charts 2 and 3 that the number of households is high in Chilooko and that average travel time to reach school is over 80 minutes in Chikho area.

Chart 2: Primary School Households

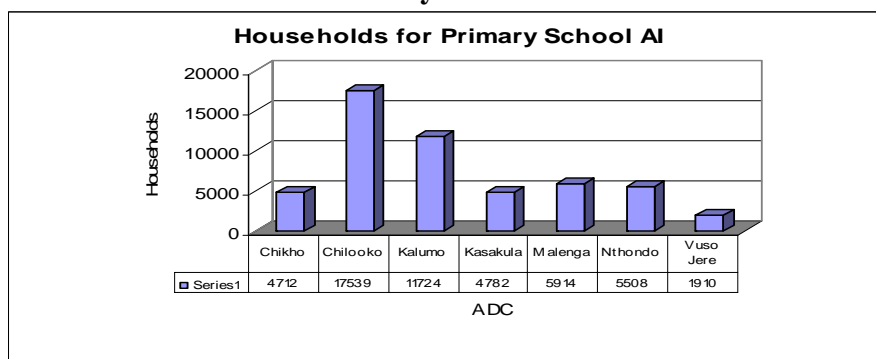
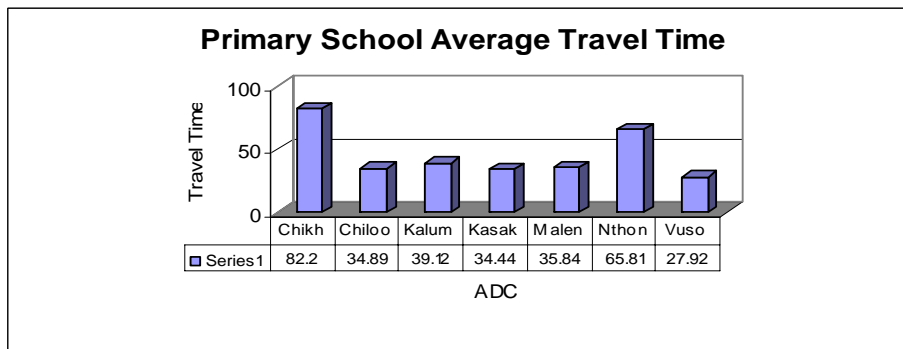


Chart 3: Primary School Travel Time



FARM INPUTS Charts 4 and 5 on farm input accessibility are given below.

Chart 4: Farm Input Accessibility

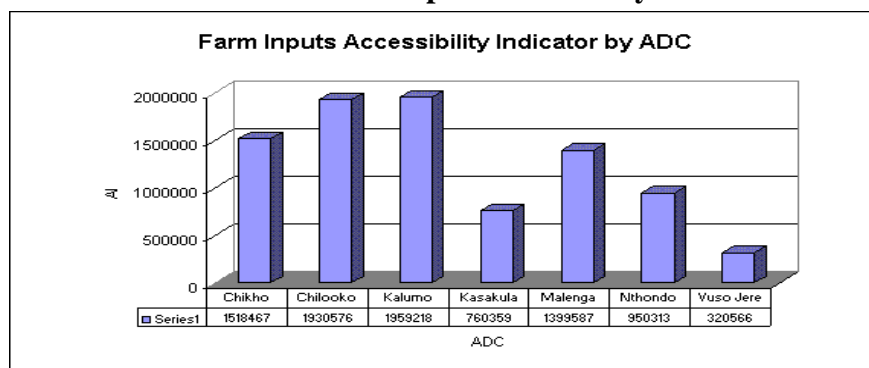
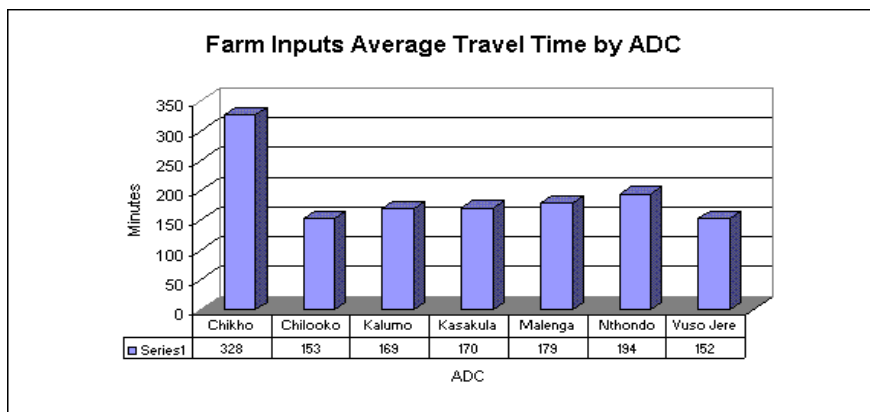


Chart 5: Farm Input Travel Time

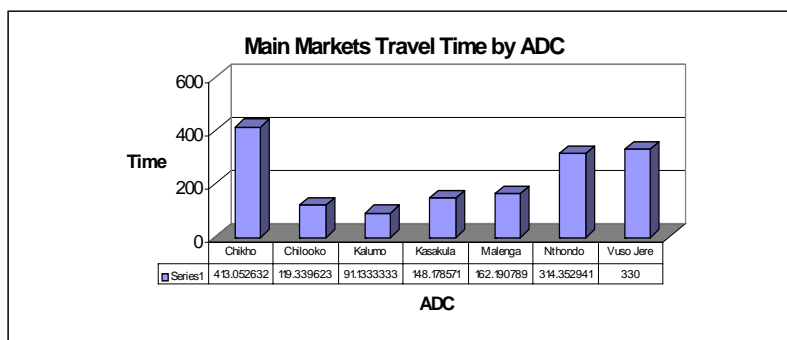
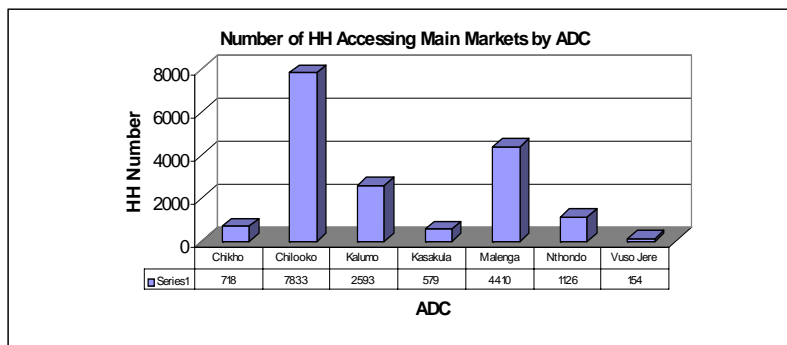
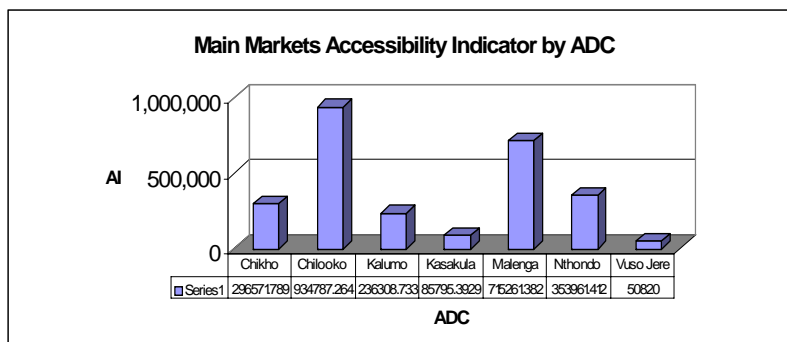


It can be seen in charts 3 and 4 that although Chilooko and Kalumo have the highest demand, travel time is a problem in Chikho.

TRADING CENTRES

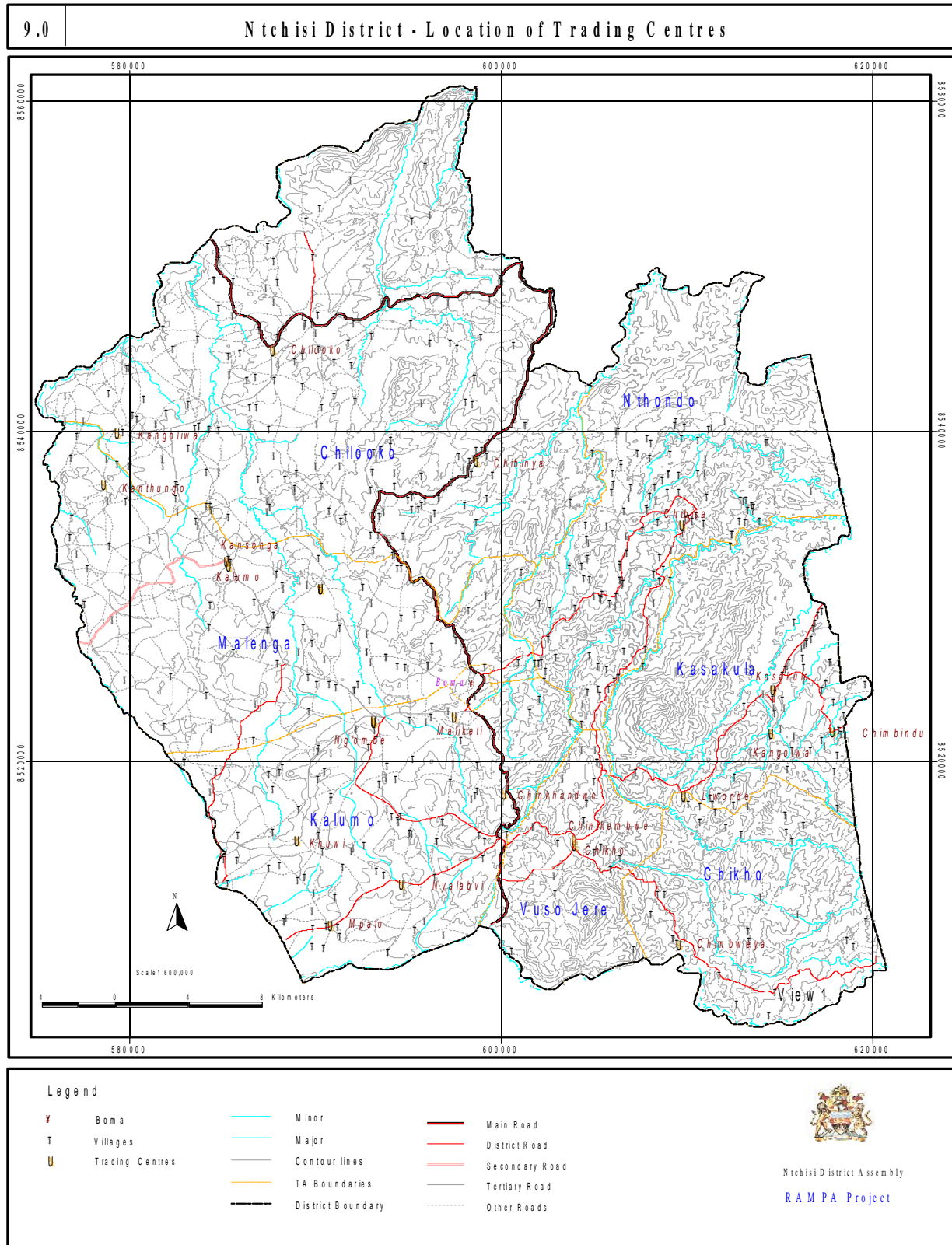
Most of the ADCs such as Nthondo, Vuso Jere and Chikho are very far from main markets with travel times ranging between 300-400 minutes as shown in the charts below. To reduce travel time there is need to introduce weekly markets in those ADCs and improve mobility through increasing transport facilities. It is likely that the long travel time for Chikho to visit a main market suppresses the number of households making that trip. Conversely, in Chilooko the travel time is short and hence many households take advantage of the market availability.

Charts 6 to 8: Market Accessibility

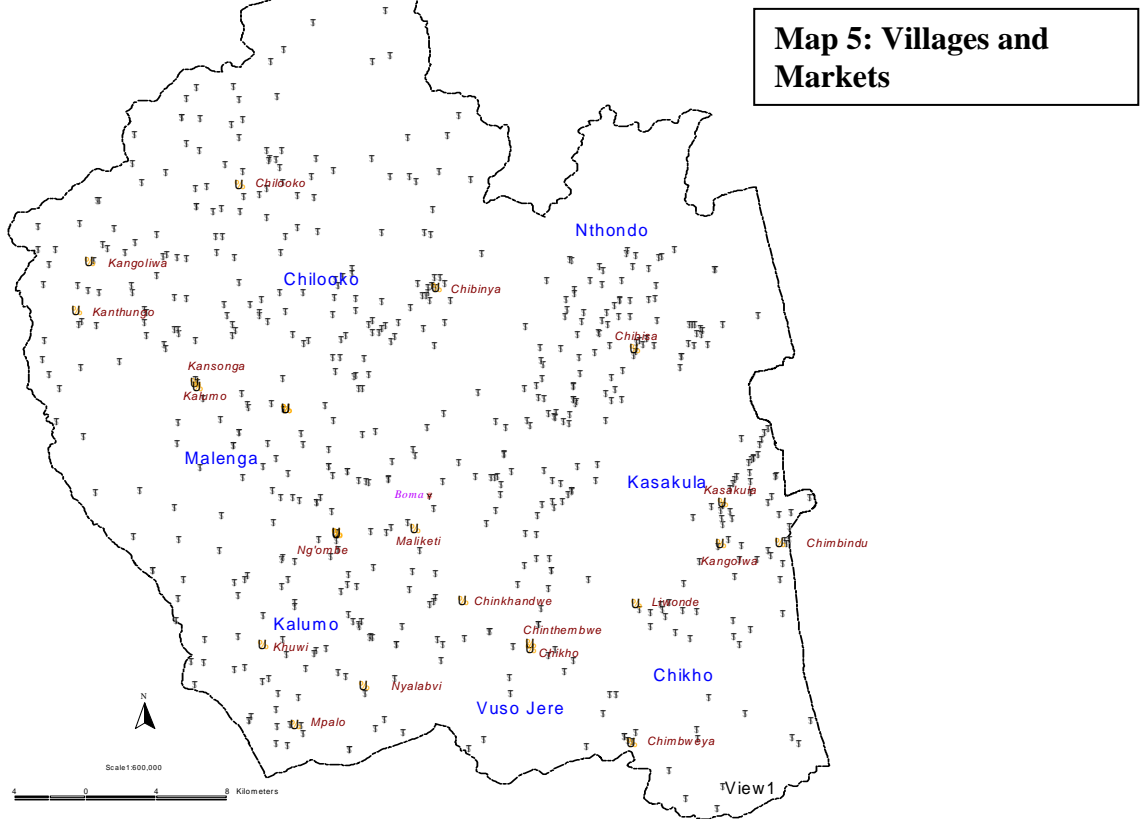
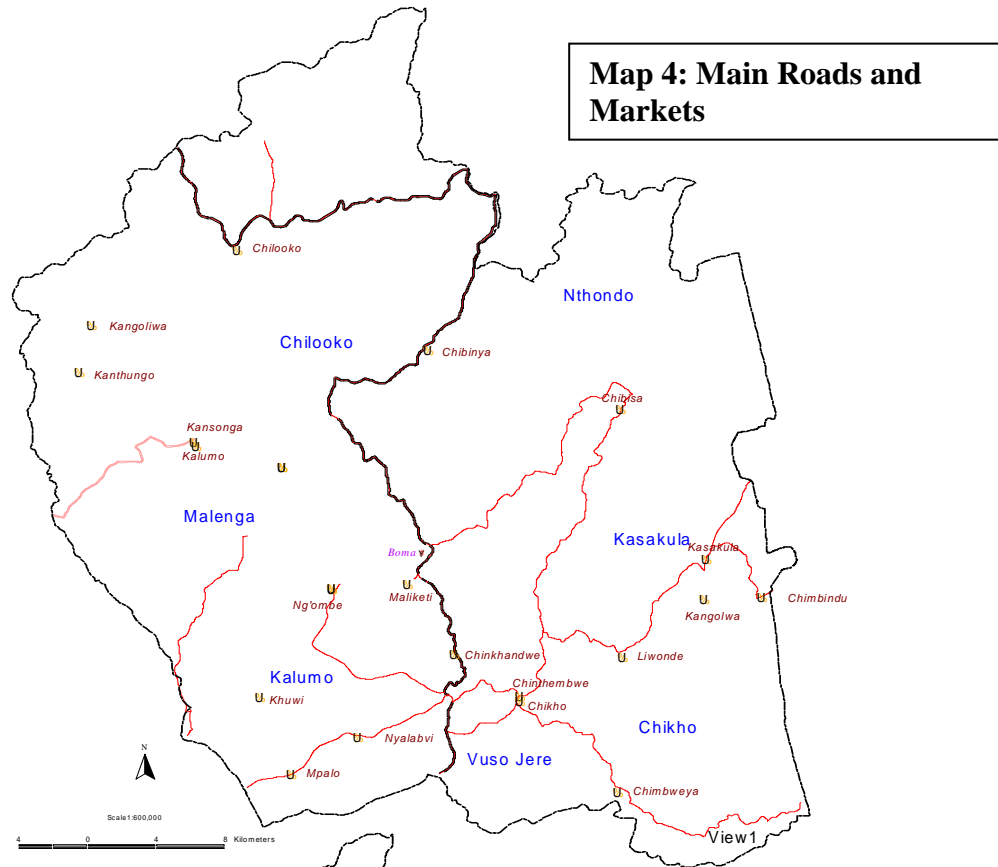


A detailed topographic map showing the location of the main trading centres is given in Map 3 below:

Map 3: Topographical Map of Ntchisi District Showing Main Roads, Trading Centres and Villages

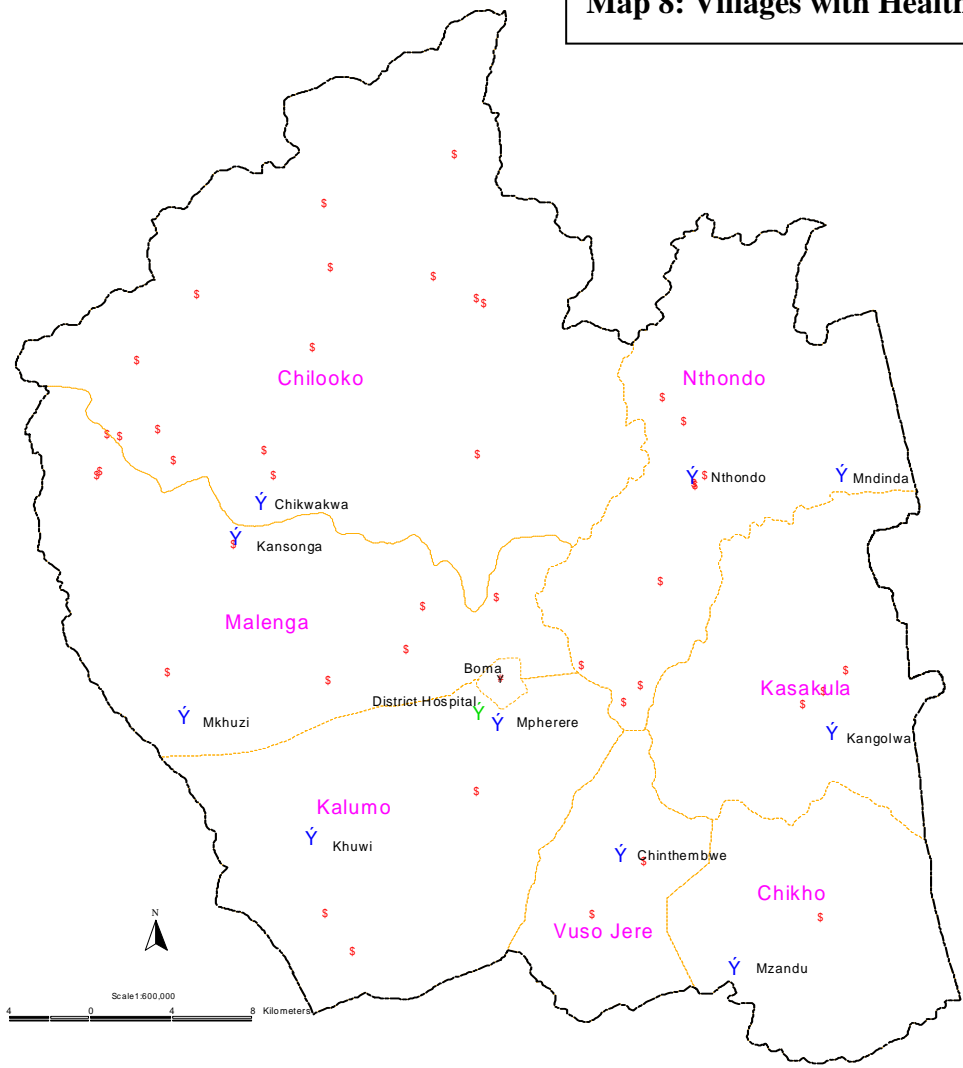


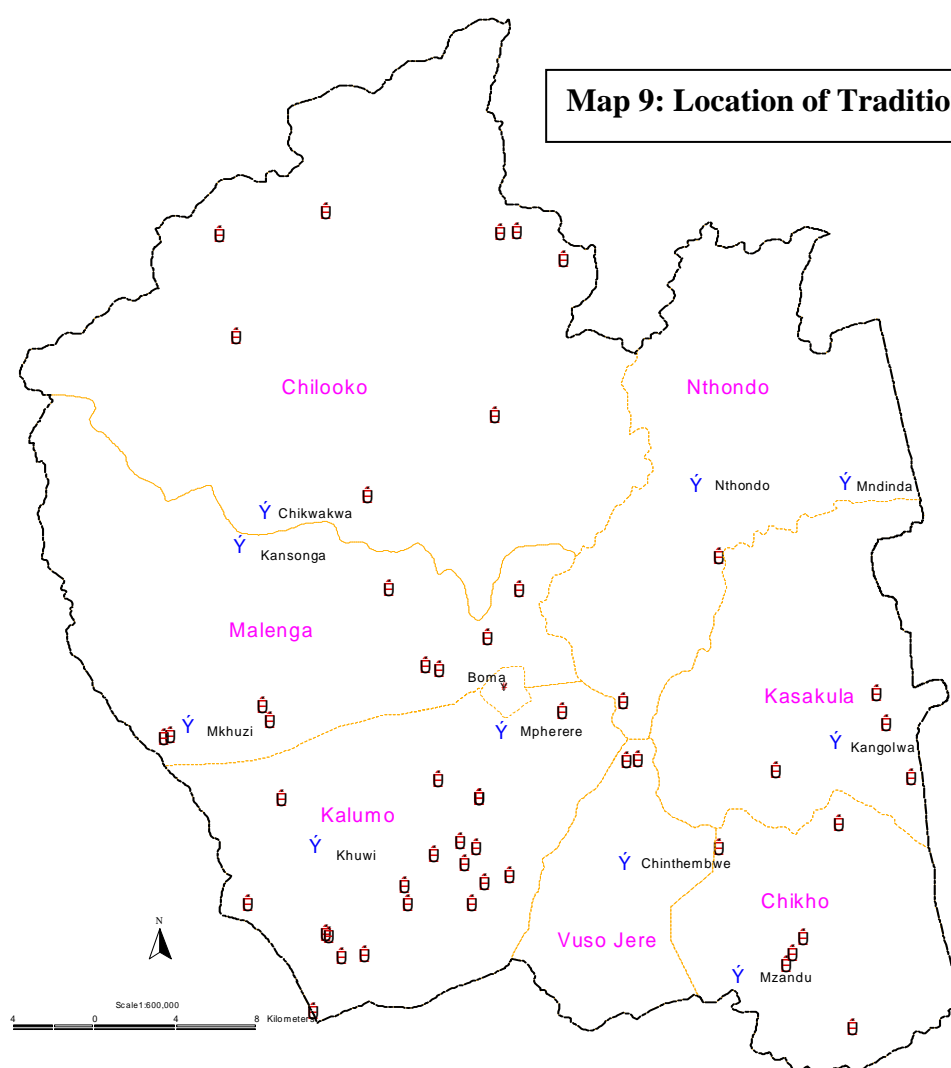
Map 4 below shows that some of these markets are not linked by a secondary or main road. Map 5 below shows the location of villages in relation to these markets.



Map 8 shows villages with a health AI of greater than 5,000. Chilooko ADC has already been identified as having a problem from the bar charts. From this chart building a health centre in the north of Chilooko, improving access west of Chikwakwa and Kasonga health centres, and improving access north of Kangolwa health centre in Kasakula ADC would be well justified.

Map 8: Villages with Health AI>5,000



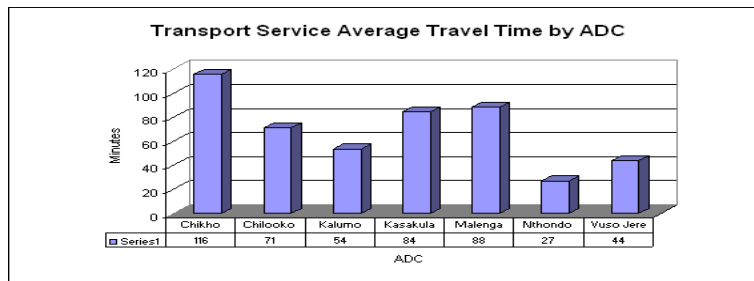
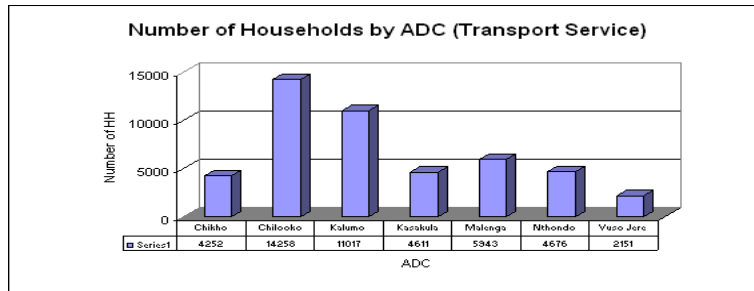
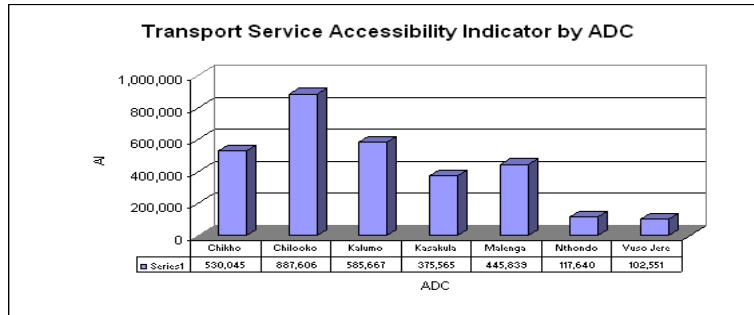


It is interesting to note that there are more traditional healers in Ntchisi than health centres as illustrated in map 9. The role of such people should not be dismissed since they provide a affordable services that the Government authorities cannot provide. However, these “Healers” also offer a number of other services such as identifying thieves and helping people to become promoted.

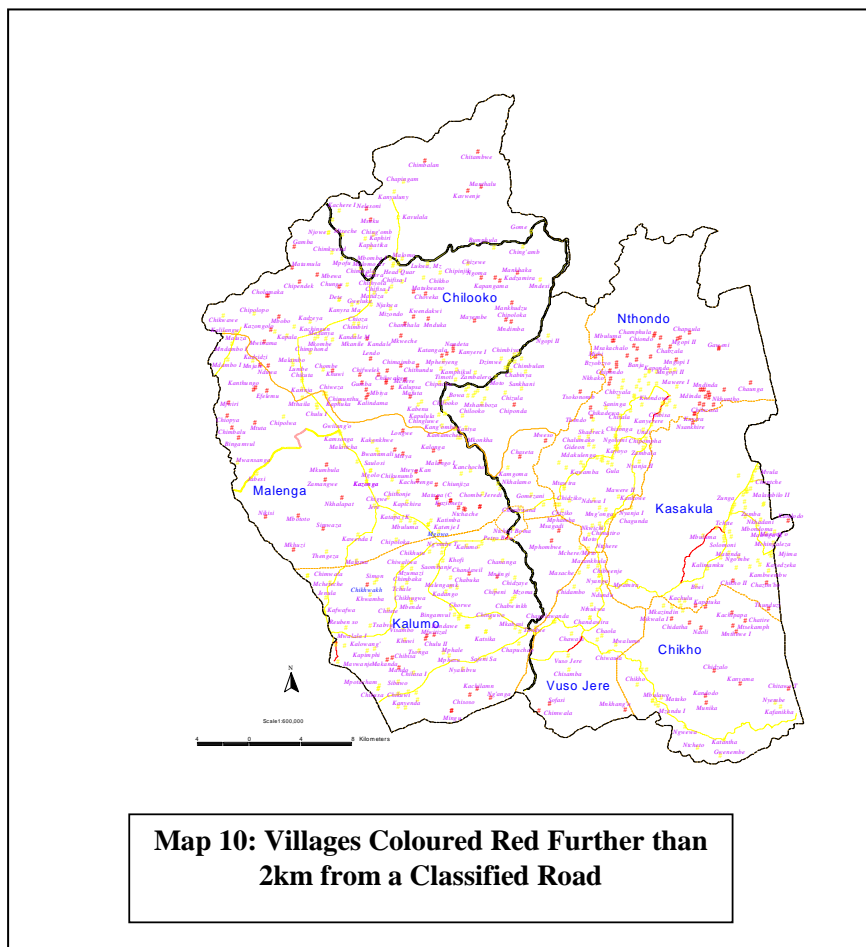
TRANSPORT

Ntchisi District is linked to other districts through a network of roads. There are five classes of roads in the district, namely, main, secondary, tertiary, district, and undesignated roads. The district has a road network of 877km. Most of these are earth roads, which are in poor condition but still passable throughout the year. Within this road network are 51 bridges, 608 culverts and 31 drifts. Charts 12 to 14 below show that the time householders take to reach transport services can be nearly two hours in Chikho area. The high AI in Chilooko area shows a high demand for services and that is related to its relatively high population.

**Charts 12 to 14
Transport Service
Accessibility**



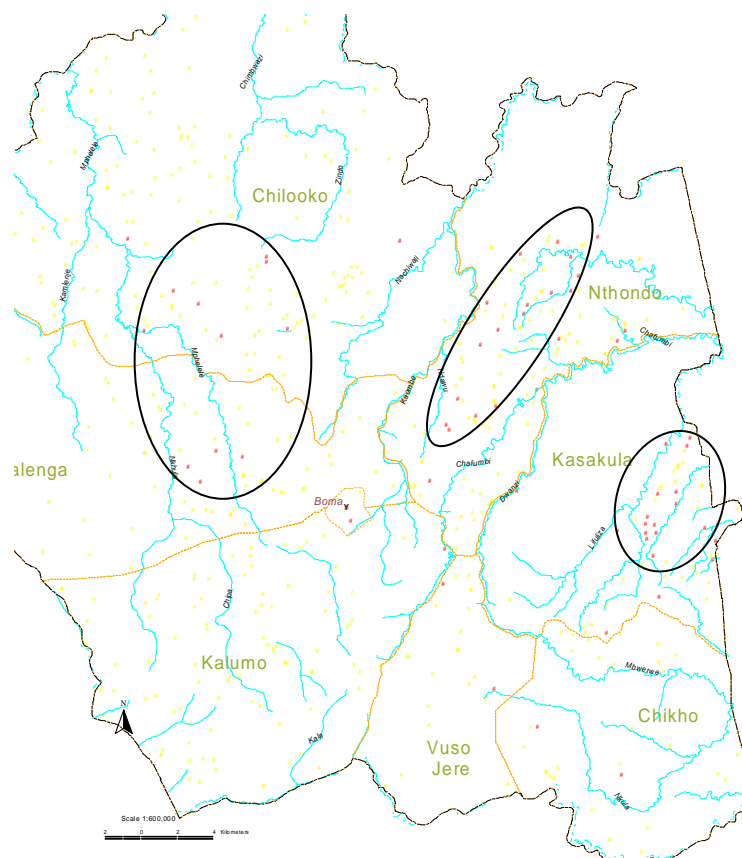
The World Bank is promoting the target of accessibility of all to within 2km of an all weather road. The GIS has been queried to identify villages that are more than 2km from a classified road. These villages are shown red dots in Map 10 opposite. Unfortunately, not all classified roads are all weather in Malawi, but that should also be a long term target and the power of GIS is illustrated.



Map 10: Villages Coloured Red Further than 2km from a Classified Road

WATER

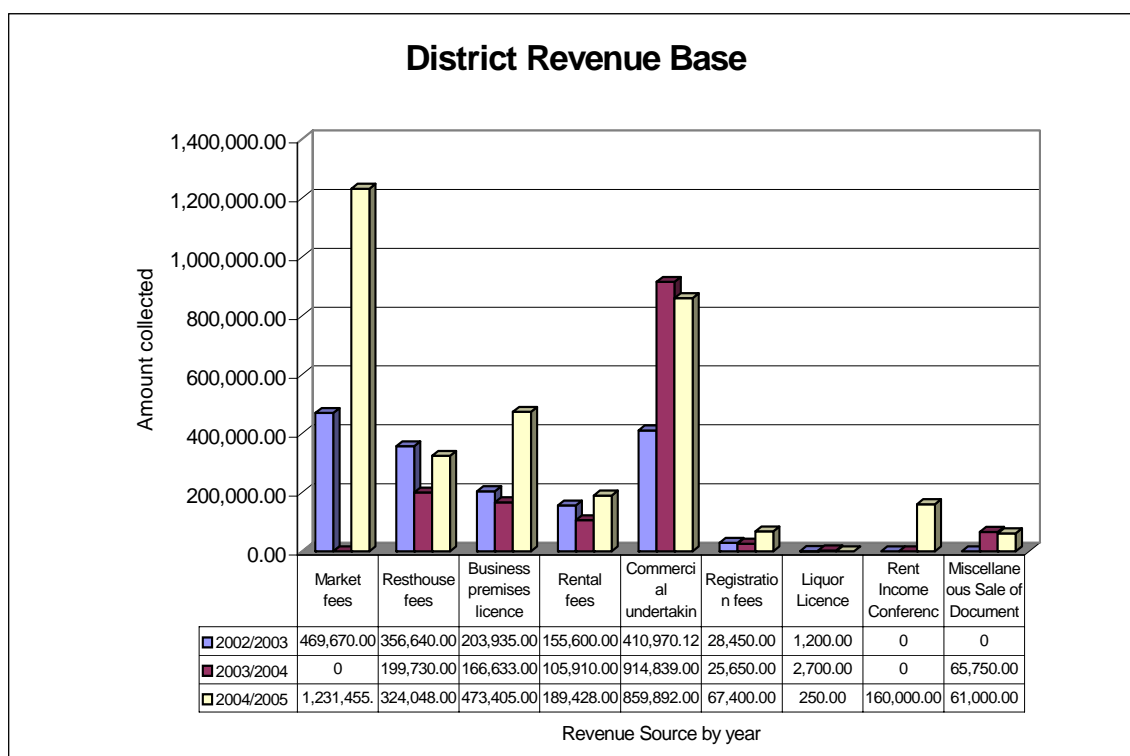
The GIS has also been queried to identify villages that are more than 300m from a borehole, well, river or spring. These are shown as red dots in Map 11 and clearly a water project starting up in the district should pay attention to these red villages, such as those circled below.



Map 11: Villages Coloured Red that are More Than 300m from Water Supply

3.4 Updating Socio-economic Profile of District

Much of the information above has been fed into a document entitled the “Socio-Economic Profile” of the District, and the RAMPA project has been instrumental in preparing the most comprehensive one in the District. Unfortunately, funds available from internal sources to solve the problems identified by the project are limited (~US\$50,000 p.a.) as shown in the following charts and tables. (MK125=US\$1)

Chart 15: District Revenue

Allocations to the District from Central Government over the last two years are low but more than doubled over the two years as shown in the table below.

Month	2003 / 2004	2004 / 2005
Total	1,872,261.00	4,521,415.00

Nevertheless, there are a number of NGOs working in the District such as:

- (i) Public Affairs Committee-National Initiative for Civic Education (PAC-NICE);
- (ii) World Vision International (WVI);
- (iii) Malawi Red Cross Society;
- (iv) National Smallholder Farmers Association of Malawi (NASFAM);
- (v) CARE;
- (vi) Circle for Integrated Community Development (CICOD);
- (vii) Target National Relief and Development (TANARD);
- (viii) Civil Rights Advocacy Centre (CRAC); and
- (ix) Civil Liberties Committee (CILIC).

Development Partners operating in the district include: European Union, DFID, World Bank, African Development Bank, UNDP, UNICEF and WHO. All of these organisations are now in a position to better target their interventions due to the establishment of the IRAP and GIS databases by the RAMPA project.

The sums provided by these various partners greatly exceed the direct government allocations. Consequently, it should be made known to all of them the planning facilities now available.

3.5 Updating District Development Plan

One of the main uses of this information is to update the District Development Plan and the latest version for the 3-year period 2006-2008 will be available in December 2005. As part of the preparation for the new Plan, a review was carried out of progress made over the period 2003 to 2005 on all the various sectors in the District and an example for Roads and Fisheries is given in Table 3 following page. Heads of department of the all the District Council sections such as Works, Education, Police and Water assembled in September and October 2005 to consider the plan, identify needs for services, this time taking into account the IRAP information.

4. Improvement in Mobility

The RAMPA project also looked at how to improve mobility within the District. This focussed on providing Intermediate Modes of Transport (IMT). The IRAP survey indicated that walking and head-loading is the most dominant form of transport and hence IMTs could ease this burden.

The survey data given in the table below indicates that the district has IMTs in the form of bicycles, oxen, donkeys, oxcarts, and wheelbarrows, bicycle trailers and ambulances. The predominant IMT is the bicycle. The bicycle and oxcarts are mostly operational in flat and rolling terrains of Kalumo, Malenga and part of Chiloko and there are markedly less operational in the hilly and mountainous terrains of Nthondo, Chikho, Vuso Jere, and Kasakula. The Wheelbarrow is mostly used for construction purposes.

With regard to gender access to the available Intermediate Means of Transport, the databank reveals that women own less of the IMTs and have limited access to the available means of transport. Yet, they share the greatest burden of domestic activities and assist males in field activities in addition to domestic chores. The male farm work is usually four months of the year (November – February). The women take over harvest jobs and other post harvest chores. Their most common mode of travel and transport is walking and head-loading. As such, women bear the greatest burden of rural travel and transport burden in the district.

Table 2: Ownership of IMTs in Ntchisi District

TA	Owner-ship ¹	Type of IMT						
		Oxen	Donkey	Animal Cart	Handcart	W/barrow	Bicycle	Bicycle Trailer
Chikho	MHH	3	0	1	5	4	133	3
	FHH	0	0	0	0	1	1	0
Chilooko	MHH	28	8	60	0	11	888	0
	FHH	1	0	3	0	0	9	0
Kalumo	MHH	68	4	104	0	17	356	1
	FHH	2	0	4	0	2	3	0
Kasakula	MHH	8	3	3	0	6	189	1
	FHH	0	0	0	0	0	22	2
Malenga	MHH	28	2	48	15	11	296	10
	FHH	0	0	0	1	0	1	0
Nthondo	MHH	2	0	8	0	2	165	0
	FHH	0	0	2	0	2	0	0
Vuso Jere	MHH	11	0	8	0	23	89	0
	FHH	0	1	0	0	4	2	0
Total	MHH	148	17	232	20	74	2,116	15
	FHH	3	1	9	1	9	38	2

MHH= Male headed households; FHH= Female headed household

Sector	Development Objective	Programme	Target Planned	Achievement	Failure	Remarks	Comments
Roads	To improve the living standards of people through enhanced and equitable Road network distribution to access Socio-economics facilities.	2002	(449.2Km)	359Km	90.2Km		
		1.1 HIPIC grading	201.6Km	38Km	163Km	Inadequate funding	National Roads Authority (NRA)
		1.2 Relief cash for work (Labour intensive)		135.4Km		To provide structural crossings on improved earthworks	Malawi Social Action Fund (MASAF)
		1.3a Roads rehabilitations	180Km	180Km			
		1.3b Bridge rehabilitations	40.9m (20 No.)	40.9m (5No.)		Contractual system	Government, EU Public Works Programme
		1.4 Gravel base reconstruction and culverts installation	5.6Km	5.6Km		Contractual system	Government, EU Public Works Programme MASAF, WVI, NRA
Fisheries	To ensure that 80% of farm families are food secured by 2005	1.1 DDP fish farming	300 Ponds	106 Pond			Inadequate resources to reach 344 Ponds.
		1.2 Fish resources management	FF-80%	FF -20%	FF-60%		The resources were not adequate to reach 80%
		1.3 EU multi annual food security	18	9 Ponds	9 Ponds		
		1.4 Fisheries (HIPIC)	32	78 Ponds			
		1.5 World vision	40	19 Ponds	21		

Table 3: Road and Fisheries Sector Development Plan Targets and Achievements 2003 - 2005

Under the project, four artisans have had two weeks training at Rumphi Polytechnic in making axles and wheels for animal carts. Thirty axles and wheels have been made and after delivery the artisans built the carts. Also, 32 donkeys have been purchased in Mozambique and are under quarantine until blood sample results come from South Africa. Delivery will take place as soon as the import licence requirements for Government of Malawi are met. Regarding credit, a Memorandum of Understanding has been signed between Malawi Rural Finance Company and Malawi Rural Transport & Travel Project/Ntchisi District Assembly for the administration of the credit. Groups have already been identified from the 7 ADCs; and will be handed over to MRFC for screening for the loans.

5. Improvement in Access

Another element of the programme looked at improving accessibility. Training of Small Scale Community Contractors was completed with the construction of 1 km of earth road labour-based standard in the 7 ADCs with structures such as culverts and drifts including one wooden deck bridge. The graduation was 1 July 2005 and this was followed by award of trial maintenance contracts at the end of August 2005 to the seven newly formed construction companies by the trainees. During the graduation, the National Construction Council Directors Technical and Training were part of the Team that inspected the works and they were quite impressed and advised the trainees to seek registration with them.

A total of 37 km were maintained under the trial contracts and all were completed well with minimum supervision. This exercise demonstrated that labour based road maintenance can be managed at district level rather than through central programmes.

6. Conclusions

The RAMPA project has been highly successful in incorporating the planning tools IRAP and GIS into the District planning cycle. Further analysis is still required following the integration of the IRAP database into the GIS. This would then enable us to pick out villages with a particular AI and then group them in a certain area for project design purposes for the other sectors not covered in this paper.

Since Ntchisi District now has the most comprehensive data and planning tool available in Malawi, the Government and its Development Partners should take advantage of this to develop well target projects in the District. A new paved road linking the District with the rest of the paved road network is now under construction. Consequently, there is every opportunity to prepare and implement a model integrated infrastructure development plan in Ntchisi District.

The cost of the RAMPA project was \$700,000 including consultancy, IRAP and GIS surveys, collection of secondary data, preparation of Socio-Economic Profile and District Development Plan, contractor training/trial contracts and IMT promotion. However, this was a pilot and it is estimated that a rollout to the remaining 25 districts in the country would cost around \$250,000 per district. This information is valid for at least five years and hence around \$50,000 per year would be spent on planning.

Malawi receives around \$500 million per year in development aid (OECD statistics). If half of it goes to district development then each district would receive around \$10m/year each. This means that around 0.5% of aid would be spent on an efficient planning system and consequently it is recommended that this pilot now be rolled out country wide.

