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Final Report

Improved Food Crop Marketing through Appropriate Transport for Poor Farmers in Uganda

Baseline Study based on Participatory Rural Appraisals and Household Questionnaire Surveys in Nine Sub-Counties of Iganga, Kasese, and Katakwi Districts

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TRL

Silsoe Research Institute

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Appendices

Abbreviations

AEATRI	Agricultural Engineering and Applied Technology Research Institute
AGOA	Africa Growth Opportunity Act
ART	Agricultural Rural Transport
ATNESA	Animal Traction Network for Eastern and Southern Africa
CAO	Chief Administrative Officer
CBOs	Community base organisations
CDO	Cotton Development Organisation
CPHP	DFID Crop Post-Harvest Programme
DAP	Draught animal power
DFID	United Kingdom Department for International Development
DAPCWI	Draught Animal Power Community Welfare Initiative
FABIO	First Africa Bicycle Information Office
FHH	Female Headed Household
GoU	Government of Uganda
HH	Household
IFRTD	International Forum for Rural Transport and Development
IDEA	Investment in Developing Export Agriculture, USAID Funded
IGA	Income Generating Activities
IITA	International Institute for Tropical Agriculture
IMTs	Intermediate Means of Transport
KDDP	Katakwi District Development Programme
KENDAT	Kenya Network for Draft Animal Technology
KPF	Karughe Farmers Partnership, Bwera, Kasese
LC	Local Council
MAAIF	Ministry of Agriculture, Animal Industry, and Fisheries
MHH	Male Headed Household
MTCEA	Multi-Purpose Training and Community Empowerment Association, Iganga
NAADS	National Agricultural Advisory Services
NALG	Nakisenhe Adult Literacy Group
NARO	National Agricultural Research Organisation
NEIC	National Environment Information Centre
NFG	National Forum Group
NGOs	Non-government Organisations
NRIL	Natural Resources International Ltd

NRI	Natural Resources Institute, University of Greenwich
PACODEF	Poverty Alleviation and Community Development Foundation
PCT	Presidential Commission for Teso
PAP	Poverty Alleviation Project
PEAP	Poverty Eradication Action Plan
PMA	Plan for Modernization of Agriculture
PM&E	Participatory Monitoring and Evaluation
PRA	Participatory Rural Appraisal
RO	Regional Office, Crop Post-Harvest Programme
RTS	Rural Transport Services
RTTP	Rural Travel and Transport Programme
SAARI	Serere Agricultural and Animal Production Research Institute
SOCADIDO	Soroti Catholic Diocese Development Organisation
SRI	Silsoe Research Institute
SSATP	Sub -Saharan Africa Transport Program
TFG	Transport Forum Group, Kampala
TRAP	Technology for Rural Animal Power
TRL	Transport Research Laboratory Ltd
UNATCA	Uganda Network for Animal Traction and Conservation Agriculture
UNFFE	Uganda National Farmers Federation
UNHS	Uganda National Household Survey
UPPAP	Uganda Participatory Poverty Assessment Project
USAID	United States Agency for International Development
WFP	World Food Programme
YWAM	Youth with A Mission, Katakwi

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EXECUTIVE SUMMARY

Background to the Project

The project **Improved Food Crop Marketing through Appropriate Transport for Poor Farmers in Uganda** was approved for funding for one year by the DFID Crop Post-Harvest Programme in April 2002. Subject to the results of a review in February 2003, the project may be extended on terms to be agreed upon.

The project purpose is to develop and promote strategies that will improve food security of poor households through increased availability and improved quality of food and better access to markets. The main outputs of the project are:

a) Capacity building,
b) Improved understanding of poor farmers' transport needs,
c) Validated technology for Intermediate Means of Transportation (IMTs),
d) Promotional material.

During the first year of the study (i.e. April 2002 – March 2003), the project has carried out the following activities:

- Assistance to the Transport Forum Group of Uganda in setting up an office;
- Strengthening of existing networking mechanisms and creation of new linkages within Uganda and international partners;
- Organisation of a kick-start workshop in May 2002 in Jinja, with the main objectives of presenting the project to stakeholders, exchange of information amongst partners, and participatory planning of the baseline survey;
- Carrying out of baseline survey using participatory and quantitative tools between September and December 2002;
- Processing, compilation and analysis of data between January and March 2002.
- Training of five Ugandan artisans in cart manufacturing in Kenya.
- Purchase and distribution of some IMTs in selected communities where the survey took place. This activity has been put on hold at the recommendation of the review team.

The project includes the following partners: Natural Resources Institute (Managing partners), Transport Forum Group (Project Co-ordinators in Uganda), Transport Research Laboratory[1], Silsoe Research Institute[2], and local partners mainly at District level (e.g. Multi-Purpose Training and Community Empowerment Association in Iganga, Karughe Farmers Partnership in Kasese, and Youth With a Mission in Katakwi). The local partners, who were either identified at the kick-start workshop or during the course of the baseline study, were involved in the baseline survey. Also, some members of these organisations went to Kenya for the aforementioned training in cart manufacturing, and were involved in the acquisition and distribution of a small sample of Intermediate Means of Transportation (IMTs).

[1] TRL Limited, Old Wokingham Road, Crowthorne, Berkshire, RG45 6AU, UK; www.trl.co.uk;
[2] Silsoe Research Institute, Wrest Park, Silsoe, Bedfordshire, MK45 4HS, UK; www.sri.bbsrc.ac.uk.

As for the policy background, the Poverty Eradication Action Plan (PEAP) states that "efforts will be made to upgrade the technological capacity of agricultural equipment is use through introduction of low-cost and scale-neutral technology such as draft power." Also, the Plan for Modernisation of Agriculture (PMA) highlights the importance of rural transport, mechanisation and animal traction.

Summary of Findings of the Baseline Survey

The Survey

As indicated above, the baseline survey consisted of a Participatory Rural Appraisal (PRA), and a household questionnaire survey (total sample size 397) in nine sub-counties as outlined in Table 1. The sub-counties were selected based on crops grown, farming potential (preferably high) and different degrees of accessibility.

Table 1: Survey Locations

District	Sub-Counties	Accessibility	No of Households Interviewed
Iganga	Ivukula	Medium	45
	Bukanaga	Good	45
	Makutu	Remote	44
Kasese	Kyabarungira	Mountains, poor access	43
	Mahango	Mountains, poor to medium access	45
	Nyakiyumbu	Mountains and flat terrain, variable access	42
Katakwi	Asamuku	Good	44
	Orungo	Remote	45
	Kapujan	Medium	44

Household Livelihoods

As for **livelihoods assets**, education has been taken as the main indicator for human capital. According to the questionnaire survey, the percentage of children attending school is of the order of 82% in Iganga, 87% in Kasese, and 71% in Katakwi (i.e. number of family members in primary or secondary school as percentage of children in the households).

Group membership is considered a main social capital asset in that it provides members with easier access to other assets (e.g. micro-credit) or offers protection in times of hardship. Overall, the membership in groups is relatively low. Only membership in credit groups (32% in Kasese) and in IGA groups (31% in Katakwi, and 15% in Kasese) stand out. As for membership in agricultural production and marketing groups, this stands at 1% in Iganga, 11% in Kasese, and 3% in Katakwi[3]. This confirms the findings

[3] To some extent, this might have been due to the selection of the villages surveyed in that it was found that NGOs such as Sasakawa Global 2000 and NALG (both in Iganga), and ActionAid (Katakwi) are quite active in forming groups in other parts of these Districts.

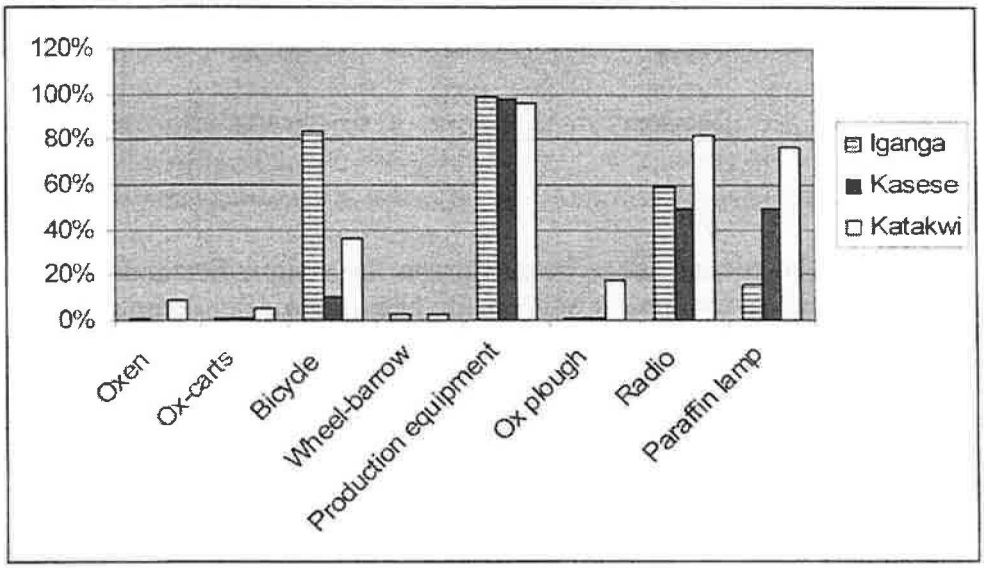
of the PRA during the course of which it was found that the majority of households conduct their farm and non-farm activities on an individual basis and may engage in social and / or economic group-based activities on a periodic basis. At the same time it is worth pointing out that group formation is strongly encouraged by GoU and NGOs alike. As a result new groups are currently being created in the villages on a regular basis.

As for access to land, the average acreage cultivated by households during the period of November 2001 – October 2002 (i.e. 12 months prior to the survey), is of the order of 2.8 acres in the case of Kasese, 3.6 acres in the case of Iganga, and 4.0 acres in the case of Katakwi. In particular, Kasese has a high proportion of villagers cultivating on two acres and less.

Bicycles are the main IMT and one of the principal physical assets owned by the households surveyed. Especially Iganga has a high ownership of bicycles (i.e. 84% in total). Katakawi District also has a reasonable degree of bicycles ownership (i.e. 36%), whereas it is limited in Kasese District which is primarily due to the mountainous terrain (Figure 1).

No ownership of donkeys, donkey carts, tractors and trailers, cars and pick-up trucks was found. The ownership of bicycle-trailers and wheel-barrows is very limited. The use of oxen and ox-carts was mainly encountered in Katakwi District, where Kapujan sub-county stands out (i.e. 16% of households own oxen and 14% own ox-carts). Draught animal power has been introduced in the Teso farming system relatively early (i.e. during the colonial period). However, cattle rustling has become a major problem in recent decades for livestock owners of the District.

Figure 1: % of Households Owning selected IMTs, and other Goods



In most cases these physical assets are owned by men. Ownership by women only appears to become comparatively more prevalent if there is a higher number of female headed households, suggesting that only household heads own assets.

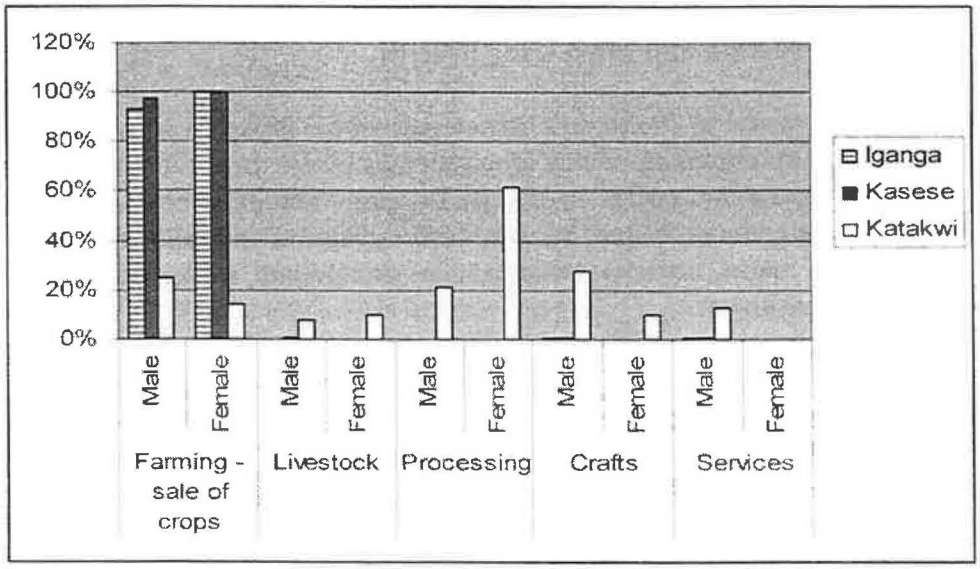
Chicken, goats, cows, and pigs are the main forms of livestock owned by the households. However, there are differences between the Districts, in that only very few farmers own cattle in the sub-counties surveyed in Kasese (3%). On the other hand, 35% of farmers in Iganga and 46% of farmers in Katakwi own at least one cow.

The **vulnerability context of farmers** has to be seen in the context of shocks, trends, and seasonality. Insurgencies during the last decades have been one of the key factors causing household vulnerability, in particular in Kasese and Katakwi Districts. This may partly explain the higher number of female headed households in these two Districts (12% and 16% respectively) as compared to Iganga (4%). Aids is another factor leading to household insecurity in communities. As already indicated, cattle rustling still prevails in Katakwi thereby causing a constant threat to livestock owners and their restocking efforts. This has also implications for the spread of IMTs such as oxen and ox-carts in this District.

Trends include declining soil fertility, and declining farmgate prices for major cash crops such as coffee. Prices of some of the food crops can also fluctuate widely from one year to another (e.g. maize prices were particularly low in 2002).

As for **livelihoods strategies and outcome**, Income Generating Activities (IGAs) show how households use their asset base within a given context (i.e. vulnerability and institutional / policy contexts) to earn their living. Figure 2 indicates the main occupations and Income Generating Activities (IGAs) of household heads. Farming and the sale of crops clearly dominates the economic activities of villagers in Iganga and Kasese Districts (i.e. 93% and 98% respectively). Other activities only play a minor role in these two Districts.

Figure 2: Selected Primary Occupations / IGA by Household Head, by Gender (by percentage of household heads)



NB: Percentages are related to the totals of male and female headed households. It is important to bear in mind that the majority of household heads are male. Female headed households (FHHs) represent 4% (Iganga), 12% (Kasese) and 16% (Katakwi), respectively.

In Katakwi, on the other hand, the household livelihoods are much more diversified in that farming, traditional processing of primary produce, and crafts each occupy about a quarter of the household heads' income portfolio. In addition, activities related to the sale of animal produce and services also play a role there.

As far as IGAs by female headed households (FHHs) are concerned, farming and the sale of crops are their only primary occupation in Iganga and Kasese. In Katakwi, however, traditional processing of primary produce (i.e. 62%) plays a dominant role for FHHs (i.e. in particular beer brewing). Other primary IGAs carried out by FHHs in Katakwi include sale of livestock produce (10%), crafts (10%), and waged or salaried work (5%).

At the same time, there are **variations of poverty** within the communities reflected in varying degrees of access to resources and capital assets (e.g. education, land, livestock ownership), which in turn lead to variations in income levels. Often, those considered rich (i.e. in general, having a monthly income in excess of USh200,000) are also engaged in other IGAs such as trade or civil service. Those who are considered poor in the villages often earn well below USh100,000 per month. Concerning landownership, as already indicated the number of households with small plots of land is especially high in Kasese District.

At the same time, it needs to be borne in mind that poverty is not only reflected in levels of income or expenditure but also in factors that are more difficult to quantify (e.g. social needs or people's feeling of powerlessness to influence their own destiny). According to the Uganda Participatory Poverty Assessment Project (UPPAP), lack of market access, poor health, and lack of education and skills figure highest amongst the causes of poverty in rural areas. Poverty is mainly a rural phenomenon in that 48% of the rural population live below the absolute poverty line compared with 16% of urban dwellers (PMA, 2000).

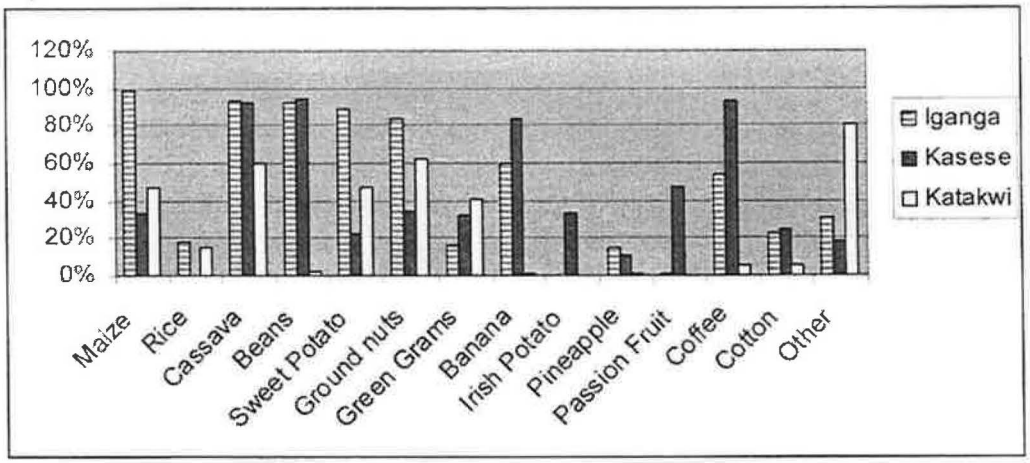
The Agricultural Production and Marketing System

As for the **farming systems** in the three Districts surveyed, Figure 3 shows to what extent the farmers rely on a number of key crops such as maize, beans, cassava, sweet potato, groundnuts, banana and coffee in Iganga District. The main crops grown by Kasese farmers include cassava, beans, banana, coffee, passion fruit and Irish potato. Katakwi farmers grow maize, cassava, sweet potato, groundnuts, millet and sorghum and oilseeds such as sunflower.

Based on the survey data, Iganga has the highest amount of **crops marketed** (i.e. in particular maize, beans, and coffee), which is a result of its location close to major marketing centres such as Kampala, and Kenya. As can be seen from Figures 4 and 5, Kasese also has a reasonable degree of crop marketing (i.e. especially coffee, passion fruit, and Irish potatoes).

Katakwi, on the other hand has a much less commercialised farming system in that the quantities marketed are lower than in the other two Districts. Only comparatively small quantities of crops such as maize, sweet potatoes, cassava, and coffee are sold by farmers of this District.

Figure 3: Crops planted by Households, by District



NB: Other crops in Katakwi include oilseeds (e.g. simsim, and sunflower) and grains (e.g. millet and sorghum).

The gender responsibility for sale varies according to crop and, and in some cases region, although high value food crops and traditional cash crops such as coffee or cotton are predominantly sold by men. Traditional food crops may be sold by men only or women only or a combination of both depending on the location.

As for the place of sale, selling from home and at the village market are the two main locations in all three Districts. However, the majority of farmers in Iganga District tend to sell their crops at the farmgate, as compared to Kasese and Katakwi Districts, where relatively more farmers go to the village market to sell their produce. Selling at the District market or the village store is relatively uncommon, with some exceptions in Kasese (e.g. 28% of farmers sell coffee at the District market, and 63% of cotton producers sell their harvest at the village depot).

The average distances to the main markets are 11km (Iganga), 13km (Kasese), and 16km (Katakwi) in the sub-counties surveyed. As for storage, the vast majority of farmers store their produce at home. In all three study areas the majority of farmers sell the bulk of their crops to non-local traders. Village agents come second, whereas selling to other buyers such as groups, private companies or neighbours rarely takes place. The fact that more than half of the cotton growers in Kasese sell to co-operative societies represents an exception.

Figure 4: Crops Marketed During the Last 12 Months (% of households)

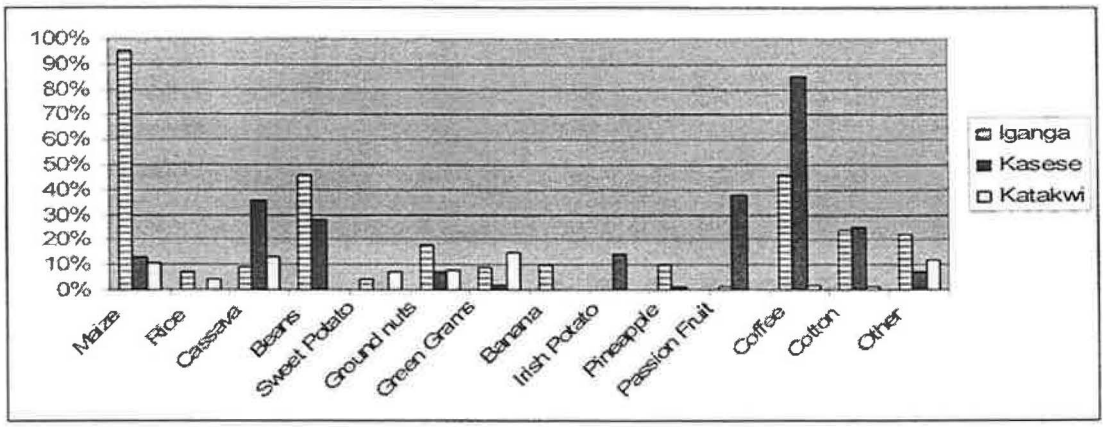
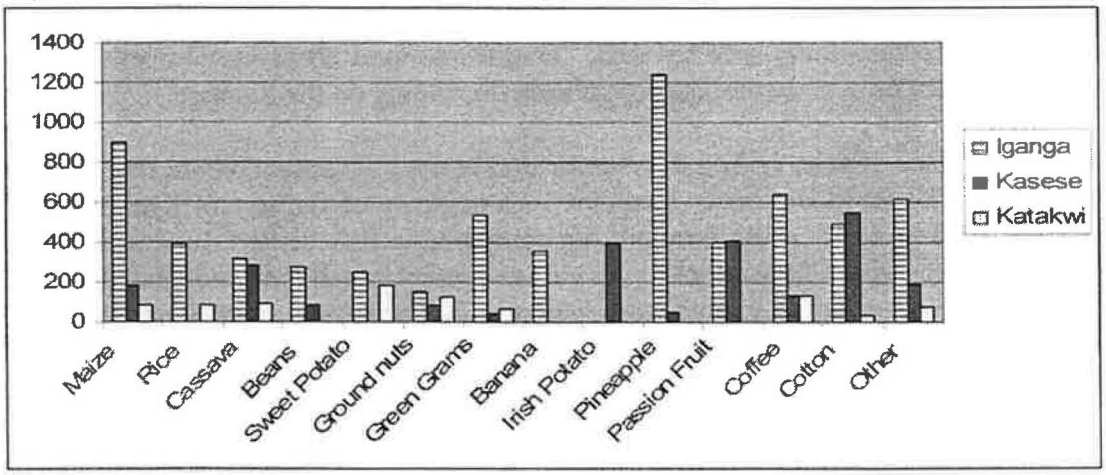


Figure 5: Crops Marketed (mean kg per household)



NB: The mean quantities refer to those households that sold at least some of the crop.

The Rural Transport System

The use of **motorised forms of transport** (e.g. motorcycle, pick-up, mini-bus, tractor, lorry, and car) during the 12-month period prior to the PRA, was found to vary considerably. The use of motorised vehicles is particularly limited in the mountainous parts of Kasese District. Whilst some communities have constructed roads to facilitate access for the vehicles, the latter may only come on demand or not at all if the terrain is too difficult for them to access the villages. On the other hand, even in the flatter areas of Nyakiyumbu Sub-county near Lake Edward the use of motorised vehicles is quite limited.

In Iganga District the overall use of motorised means of transport is far more common compared to Kasese, however it is quite difficult to discern a clear pattern by mode of transport or gender. Motorcycles, mini-buses and pick-ups are the main forms of motorised transport used by both men and women. However, this can be quite location specific in that one form of transport may dominate in one village whilst it is a different one in another village. Although the overall use of motorised means of transport in Katakwi appears to be similar to Iganga, here it is equally difficult to discern a clear pattern. Women may not have used pick-up trucks over the last twelve months in one village (although these were available since men used them) whilst they might have extensively used them in another village of the same District. Whilst it is commonly found that men capture the means of transportation due to cost and status, the fact that no village members were found to own these modes (in all cases people are paying for a ride, or hiring), may explain the generally high female utilisation.

The main reasons for using motorcycles, buses, or mini-buses (also referred to as taxis) include health (e.g. emergency such as taking sick people to the clinic or hospital), economic (business in urban centres and market), or social (e.g. funerals, or weddings). The fact that vehicles for carrying heavy loads such as lorries or tractors and trailers are rarely used highlights that motorised vehicles are required by villagers primarily for travel rather than transport purposes.

As for **Intermediate Means of Transportation (IMTs),** bicycles are by far the main mode used in that 60 – 100% of both men and women have used them in the villages of Iganga and Katakwi Districts over the last 12 months. However, whilst the figures for use by men and women are similar, this does disguise the frequency of use. Through observation and informal discussion with village members it was found that men use bicycles more frequently than women, reflecting the fact that ownership is entirely in the hands of men. This reflects a cultural norm in which men dominate ownership and control over the means of transportation. As indicated above, bicycle ownership is highest in Iganga District, followed by Katakwi, whilst it is limited to non-existent in Kasese District.

Other IMTs that are used in the villages include stretchers (mainly in Kasese), sledges (mainly Katakwi), ox-carts (mainly in Kapujan sub-county of Katakwi), boats (also Kapujan due to the lake) and wheelbarrows. Although ownership of the latter is low, men of four villages (out of six) in Iganga and Katakwi have used them relatively frequently by hiring or borrowing them for the transport of building material, manure to the field and crops from the field (i.e. up to about 50% of men).

Human porterage (i.e. head, back, shoulder and hand loading) was found to be the most prevalent mode of transport at community level in all three Districts. Differing forms of human loading reflect gender-specific tasks. Men tend to carry the bulkiest loads: produce, production equipment and building materials (primarily using the shoulders), while women carry produce, water and firewood (using the head, or back in the case of Kasese) and children (using the back). These modes are primarily practical, but are also embedded in social norms, with certain modes not socially acceptable by men. On average, women were found to spend many more hours engaged in porterage than men, reflecting the variety of domestic and productive tasks conducted. Weighing exercises revealed that women carry loads of 30 to 35 kg on their heads or backs.

Transportation of crops to the home primarily takes place on foot (i.e. human loading), with only some farmers in Iganga District using bicycles for the transport of specific crops (e.g. coffee or maize). The use of bicycles in Kasese or Katakwi for transporting crops from the field to the farm is very limited.

As for the **transport of crops from the farm to the village market**, it was possible to discern clear patterns whereby almost all the farmers in Iganga would use a bicycle, although it needs to be borne in mind that the majority of them sell from their farm. Almost all the farmers in Kasese would use human porterage, whereas the system seems more diversified in Katakwi District in that human loading, bicycles, or lorries would be used.

It has already been indicated that only a few farmers would transport their crops to the District market. The means of transport to do this would include mostly human porterage in Kasese, and a mix of means in Iganga District (i.e. bicycles, pick-up truck, lorry, and mini-bus). The very few farmers who transport maize to the market in Katakwi town would use a bicycle.

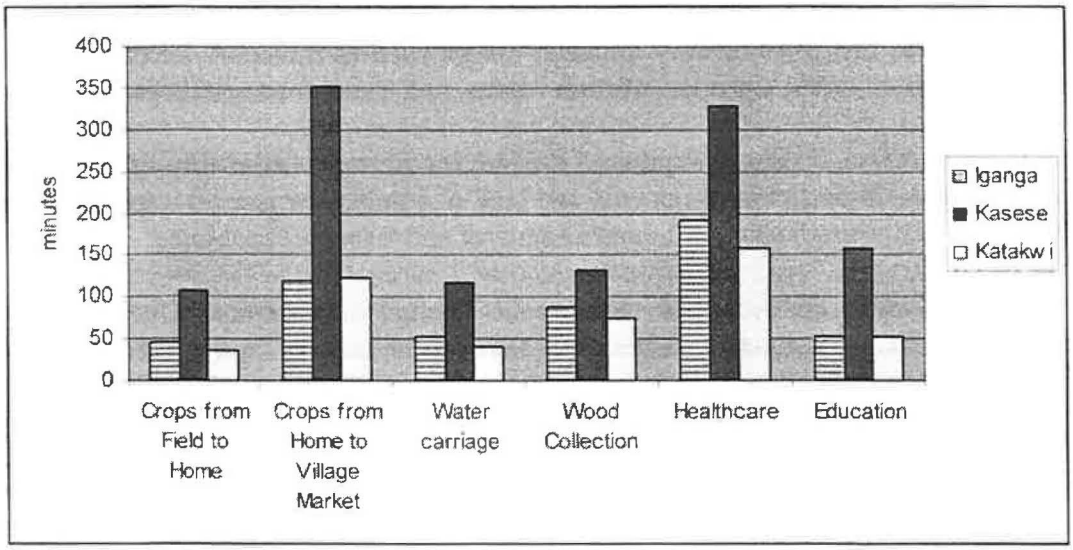
Transport use for domestic purposes is mainly dependent on human porterage and walking in that wood collection exclusively takes place on foot. Walking is also mostly used for water collection and purchasing of consumer goods. Bicycles are only used to some extent in Iganga for water carriage, and for shopping in both Katakwi and Iganga District (i.e. about 30%). Walking would be the dominant mode of transport for the overwhelming majority of Kasese villagers undertaking these tasks.

According to the questionnaire survey, transport use to obtain services such as health care and education shows a mixed picture, in that walking is the only mode to go to school, and, depending on the location, walking and bicycles are used to visit health care facilities. In Kasese District, walking is the principal mode of transport to reach health facilities, whereas 85% of Iganga villagers and 35% of Katakwi villagers would use a bicycle. As for transport for social reasons, the picture is similar to that of transport for health reasons. In all three Districts, very few farmers would use motorised means of transport for health or social reasons according to the questionnaire survey.

Regarding the average time per trip, the survey clearly reveals that villagers in Kasese District spend much more time for transport purposes than their colleagues in Iganga or Katakwi District. For example, the average return trip time to fetch water is 118 minutes in Kasese compared to 53 minutes in Iganga and 41 minutes in Katakwi. The fact that the Kasese villagers also indicated fewer trips per day (i.e. 1.2) compared to 2.5 and 2.1 in Iganga and Katakwi respectively, indicates that they are likely to have less water available for domestic purposes. Similar results have been obtained for other domestic transport uses and for the transport of crops from the field to the home and from there to the village market, as is highlighted in Figure 6.

As for other means of transport such as bicycles, differences in the average trip time are less pronounced, although it needs to be borne in mind that owing to the hilly terrain the Kasese villagers depend much more on walking and human porterage. Transport of crops by bicycles is not always faster than transport on foot due to the fact that these IMTs are often used to transport heavier loads rather than for speed.

Figure 6: Average Trip Time Using Foot as Main Mode of Transport



NB: The trips for transport of crops from the field to the home store and from the home to the village market refer to one-way trips. The trips for water carriage, wood collection, health care and education refer to return trips.

Regarding **transport economics**, the principal cost element in the use of an IMT is the capital cost involved in its acquisition. Operating costs tend to be low, given that no fuel is required and repairs or veterinary care is comparatively inexpensive.

Bicycles which are the most prevalent IMT cost about USh100,000 when purchased anew. Although this may seem a modest sum of money, it is still beyond the reach of many villagers who are struggling to meet their daily costs of living. Other IMTs found in Uganda and considered for this research, include oxen (USh300,000 – 350,000), donkeys (USh80,000 – 100,000), ox-carts (USh250,000 – 700,000), donkey-carts (USh200,000 – 300,000), and wheelbarrows (about USh40,000).

Research has found that bicycles have the lowest operating cost only at short distances (10km maximum) and where demand is low (Starkey, 2002). They are quite suitable for rural transport characterised by the transport of small loads over short distances as long as roads or tracks are relatively flat. Donkeys also represent a relatively inexpensive option for short distances and low levels of demand, and can be used in hilly terrain. Ox-carts are the lowest cost option for annual transport demand between about 10 to 250 tonnes (assuming a 10km distance). Over longer distances (i.e.50km), ox-carts are the cheapest option only up to 50 tonnes annual demand. For heavier loads to be transported over longer distances, motorised transport such as farm vehicles, powertillers, tractors and pick-ups are the best option.

The use of ox-carts requires load consolidation if individual farmers produce and market relatively small amounts of agricultural crops. This points to the need of introducing IMTs through groups given that individuals on their own are unlikely to be able to afford the animals or vehicles.

It also needs to be borne in mind that all IMTs are unlikely to be used exclusively for crop marketing. The project ought to envisage a multi-purpose use of the IMTs to be tested. This also reflects the transport priorities indicated by villagers who named crop transport as one priority only amongst others such as transport for other IGAs, domestic transport needs, transport of farm inputs, and travel for social reasons.

In all three Districts, villagers expressed a **need for better availability of means of transportation**. In particular, high cost and lack of available transport were indicated by both men and women as main household travel and transport problems.

Donkeys in Kasese District, and ox-carts in Iganga and Katakwi Districts were identified together with farmers as potential IMTs to be tested. Due to the conditions of the farming system and the terrain, animal transport seems the most viable option for Kasese farmers for the time being. However, it needs to be pointed out that past efforts to introduce these animals in the District have failed due to lack of sensitisation, training, and follow-up. It is important to avoid these mistakes if future attempts are to succeed.

Amongst the three Districts, Iganga farmers currently produce the largest amounts of agricultural produce for sale. Bicycles which are commonly used in the District are only suitable for transporting smaller amounts of produce over shorter distances. As a consequence, the testing of a larger-capacity means of transportation appears justified. This would provide farmers with more options for selling their produce (e.g. selling at the market rather than at the farmgate, which in turn would result in a price premium estimated at 20 – 30%).

Although ox-carts are already used in some sub-counties of Katakwi, it appears that there is scope for design improvement. In addition, given the problem of cattle rustling in this District the introduction of donkey carts may represent an option to be envisaged. Other IMTs which were considered with farmers during the course of the survey in the three Districts include power-tillers and bicycle trailers, however it was found that the former is too expensive for rural communities under current conditions, and the latter required flat and smooth road surfaces, which presently do not exist in most villages.

The design standard and the condition of the **road infrastructure** are key in terms of all-year access for communities. Earth feeder roads, which are easily rendered impassable in the rainy season, mainly traverse the three districts surveyed. The roads, which have drainage structures at river crossings, are suitable for IMTs and motorised vehicles not heavier than light (i.e. 4-tonne) trucks. However, in some cases heavier vehicles transporting produce or building materials use these roads damaging the running surfaces severely and in most cases damaging the drainage structures thereby cutting off community access. This points to the need of adequate maintenance of community access roads and tracks.

Local Organisations and Support Services

Local organisations (e.g. NGOs) and potential support services (e.g. artisans, micro-finance) have been identified during the course of the survey with a view of involving them in the research during its later stages. Local partners who took part in the baseline survey include the following: Multi-Purpose Training and Community Empowerment Association (MTCEA) in Iganga, Karughe Farmers Partnership in Kasese, and Youth With a Mission (YWAM) in Katakwi. Members of these organisations were subsequently invited by the project to attend a training workshop in cart manufacturing in Kenya.

In addition to these organisations, contacts were established with other local NGOs and community based organisations (CBOs) who are potential project partners. In particular, NGOs which are involved in the formation of credit and agricultural production & marketing groups have been targeted. It is intended to involve other NGOs at District level as far as they indicate an interest in intermediate forms of transportation. In addition, contacts have been established with Local Government officials and locally based donors who all expressed an interest in the project (e.g. the Belgian Development Cooperation in Kasese).

INTRODUCTION

Background to the Study

The United Kingdom Department for International Development (DFID) Crop Post-Harvest Programme started to fund the first phase of the project on **Improved Food Crop Marketing through Appropriate Transport for Poor Farmers in Uganda** in April 2002. Subject to the results of a review in February 2003, the project may be extended on terms to be agreed on.

The project purpose is to develop and promote strategies that will improve food security of poor households through increased availability and improved quality of food and better access to markets. The main outputs of the project are:

e) Capacity building,
f) Improved understanding of poor farmers' transport needs,
g) Validated technology for IMTs,
h) Promotional material.

The outputs of this project will enhance the understanding of issues related to rural transport in Uganda, such as needs for intermediate means of transportation, constraints to up-take, and potential implications of improved transport for the farming system. Means of transportation will be tested and validated and the recommendations consequently developed will be presented to private sector associations, Government bodies (relevant Ministries), and National Agricultural Research Organisation (NARO), the donor community, non-government Organisations (NGOs), and relevant Networks. It is expected that their uptake will lead to an improvement of poor farmers' livelihoods.

A **Kick-Start Workshop** was held on 27th-28th May 2002 in Jinja at Sunset Hotel International, Uganda. The main purpose of the workshop was to involve key stakeholders and all members of the core research team in planning the baseline study in detail. Given the similarities between the Kenya Network for Draft Animal Technology (KENDAT) led and the Natural Resources Institute (NRI) led projects and the fact that the former will be crossing over into Uganda, the workshop was jointly held in Uganda together with the team of the KENDAT-led project. The workshop was attended by 21 stakeholders representing a wide range of sectors touching on rural transport in Uganda. The workshop was held immediately following the International Conference on Animal Traction and Conservation Agriculture, which was also attended by Dr. Kaira, Research Coordinator, Transport Forum Group, and Mr. Kleih, Research Team Leader, NRI. This proved crucial for the success of the Kick-Start Workshop as most of the stakeholders were identified at the Animal Traction workshop. Prior to that Dr. Kaira had attended the Kick off Meeting of the parallel project in Kenya from 6th to 8th May 2002.

Scope of Study

Rationale and Aims. In view of the project's objective, to improve food crop marketing through appropriate transport for poor farmers, the initial investigative studies of the baseline survey were designed with two primary objectives:

- To understand the profile, status and needs of target communities in the context of farming systems and the aligned rural transportation provisions.
- To generate data as a basis upon which the performance and impact of the project can be assessed over the life of the project and beyond.

It was recognised during the design phase of the project that in order to develop an inclusive and informed basis upon which strategic action-research interventions could be made, partnerships would need to be formed with institutions and individuals at various levels. Thus, a further sub-objective of the investigation was developed;

- To identify key stakeholders at international, national, district, sub-county and community levels as a basis for design and implementation partnerships.

Objectives. In view of these aims, a number of specific investigation objectives were determined based on a review of similar initiatives conducted in Uganda and elsewhere, and refined during the stakeholder workshop at the beginning of the project.

It was recognised that the relationship between appropriate transportation, improved crop marketing, and improved rural livelihoods is not a singular or linear endeavour, but consists of numerous complex factors, affected by a wide variety of tangible, material and non-material and less tangible or visible factors. In view of developing a reasonable basis upon which strategic interventions could be made, the study objectives were split into two tiers:

(a) To gain a broad understanding of context in which food marketing and rural transportation are situated. This includes (i) an understanding of rural household livelihoods in the target communities structured around the SL pentagon: physical, financial, natural, human and social capital assets, (ii) an understanding of the institutional context: district and infrastructural services.

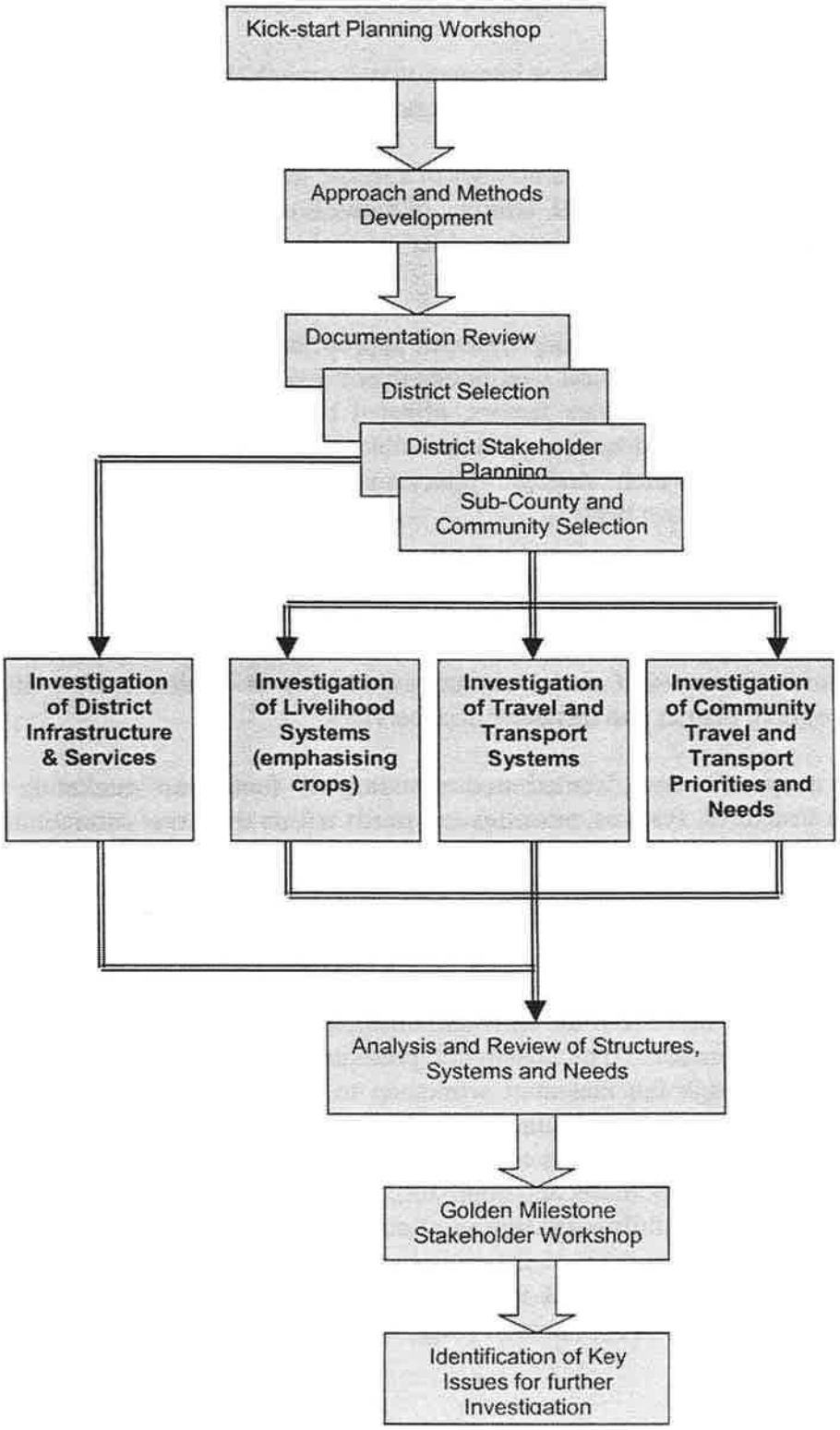
(b) To gain a specific and detailed understanding of food crop marketing and transportation structures, systems, priorities and needs within the target communities.

By detailing the objectives in two tiers, the aim is to keep the focus clearly on the aims of the project (namely the food crop marketing and transportation requirements), whilst identifying clear links with the household livelihood, and institutional contexts.

Approach. Given the breadth of the aims and objectives, the approach was designed through a series of phases. The schematic presented in Figure 7 illustrates the process, initiated through the kick-start workshop to discuss the priority areas for investigation. Drawing on the findings of past research, this workshop aimed to include key researchers from a cross section of institutions, discussing the rationale and gaps in knowledge, hypothesis and approach, and district selection, as well as an ongoing assessment of feasibility and timing of collaboration. Further, the workshop aimed to consider the integration of the project with the Government of Uganda's needs and activities, mutual benefits for researchers/stakeholders and collaborators, and ideas for dissemination of information (suggestions and requests).

This led to a series of systematic steps of designing the methods, contextual reviews and the formation of stakeholder groups drawn from government, NGO, CBO and private sector parties at the district level. On the basis of discussions through these fora, investigation sites were selected, priorities and methods refined, and studies conducted. Information gathered, including communities priorities, have been synthesised in this report (and complimentary annexes) as a basis for identifying further key areas for investigation, and potential action-research entry points.

Figure 7. Approach Schematic



Methods

A broad range of methods were selected depending on the objectives, the level of data collection (district to household), time requirements and staff skills and availability. The decision to employ a particular method was determined by the variety of outputs required and inputs (staffing, time and finance) available. It is important to note that each method did not yield a finite data set. For the purpose of this survey using methods devised that merged quantitative and qualitative techniques[4] a mix of contextual and non-contextual data was attained. To ensure the quality of the data gathered methodological triangulation was applied during the research process.[5] This was particularly important to verify statements made by research participants in focus group discussions or key informant interviews. Triangulation was used to ensure that such statements whilst useful to illustrate particular points and issues were not taken as facts unless corroborated by cross correlation with other data. Figure 2. Outlines the research topics and the variety of methods used.

Table 2: Triangulation of Methods

Research Topics	Methods
Basic Transport Issues	TKU/ KI/ HHQ
Farming Systems and Livelihoods Issues	BLR/ SC/ KI/ RTT/ HHQ
Village, Regional Infrastructure and Services	KI/ TW/ SSI/ HHQ
Travel Information	DAP/ HHQ
Income Generating Activities and Transport	IGA/ RRT/ HHQ
Intermediate Means of Transportation	IMTC/ HHQ

Key: BLR – Background Literature Review; TKU – Transport Knowledge and Use Participatory Rural Appraisal; RTT –Resource, Travel and Transport Participatory Rural Appraisal; IGA – Income Generating Activities Participatory Rural Appraisal; DAP – Daily Activity Profile; KI – Key Informant discussions; TW – Transect Walk; SC – Seasonal Calendar; IMTC – Intermediate Means of Transportation Case Study; SSI - Semi-Structured Interviews; HHQ – Household Questionnaire Survey

Details of the methods employed can be found in Appendix 4[6].

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[4] It is widely accepted that the separation of quantitative and qualitative data creates problems. For instance it has been shown that quantitative methods, such as time studies and household surveys, used appropriately can give rise to qualitative data (Hentschel 1998 and Booth et al 1998).

[5] Triangulation being the process of 'using multiple perceptions to clarify meaning, verifying the repeatability of an observation....acknowledging that no observations or interpretations are perfectly repeatable, triangulation serves also to clarify meaning by identifying different ways the phenomenon is being seen (Stake in Denzin & Lincoln (eds) 1994:241).

[6] It was noted in the initial DFID review of the project (Howe and Underwood, 2003) that the term PRA had been mis-used, and that the studies conducted at best resembled RRA. Whilst it is acknowledged that the terminology is confusing, and that there is much debate about what constitutes "real" PRA, the key elements of PRA are the methods used, and - most importantly - the behaviour and attitudes of those who facilitate it. In the context of this study, whilst the PRAs were indeed 'rapid', it is felt they were participatory, both in the sense of the manner in which they were conducted (inclusive of community members views and attitudes) and by the fact that the project intends to work in these communities. Thus, this

Study Teams

A consortium of researchers led by the Natural Resources Institute in collaboration with the Transport Forum Group of Uganda, the Transport Research Laboratory Ltd, and Silsoe Research Institute is carrying out this research project. Staff from Uganda government organizations such as the Plan for Modernization of Agriculture (PMA) Secretariat and Serere Agricultural and Animal Production Research Institute (SAARI) among others are involved at both the field and policy level. Involvement of local NGOs in IMTs production, distribution and monitoring is shown in Table XX. In addition, there is collaboration with similar projects in Kenya and Ghana.

Table 3: Involvement of Partners in the Research

Organization	Activity
Plan for Modernization of Agriculture (PMA), Kampala	Provided Veterinary Doctors who complemented other professionals during the course of PRA surveys
Multi-Purpose Training and Community Empowerment Association (MTCEA), Iganga	Farmer trainers in oxen utilization, procurement, distribution and monitoring of ploughs & IMTs in Iganga District
Serere Agricultural and Animal Production Research Institute (SAARI), Serere	Farmer trainers in oxen utilization, procurement, distribution and monitoring of ploughs in Katakwi District
Youth With a Mission (YWAM), Katakwi	Design, production, distribution and monitoring of animal-carts in Katakwi
Karughe Farmers Partnership, Bwera, Kasese	Farmer trainers in donkey utilization, distribution and monitoring of donkeys in Kasese District
T Triple W Engineering Ltd, Kenya	Training of 4 Artisans from Kasese, Iganga, Katakwi & Kamwenge Districts in animal-cart wooden wheel & axle making

Process

District Selection. The criteria used in selecting three districts for research sites included but were not limited to factors such as different farming conditions in Uganda, relative potential demand for IMTs by poor rural farmers, on going projects that require IMTs to enhance their socio-economic impacts, poverty eradication and sustainability and lastly, adequate local collaborative capacity to allow for cost-effective monitoring over the research period. Four farming conditions/systems were considered to include Teso, Lango, mountainous and banana systems. Participants of the Kick-start Workshop added other criteria necessary in assisting in site selection as follows:

- Distance to small, medium and large markets.
- Areas emerging from insurgency.
- Population density and level of socio-economic activity.
- Diversity of IMTs.

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investigation was the first step in a process of interaction, not simply a rapid extraction of information.

- Topography and terrain.

Based on these criteria, **Kasese, Katakwi, and Pader** Districts were chosen by the workshop participants as part of a scoring exercise. Unfortunately, due to security problems, Pader District had to be dropped, and was subsequently replaced by the research team by **Iganga** District.

Sub-County and Community Selection. The study targeted two levels of aggregation as a basis for data collection on the utilisation and needs in travel and transport for food produce marketing. Firstly, the district headquarters, as the centre of institutional and service provision, including district government departments, non-governmental agencies, credit organisations, and transport/ crop marketing companies.

Secondly, the community component of the study focused on three sub-counties (LC3s), selected on the basis of a set of criteria. Firstly, representativeness of the farming systems within district, to ensure the study covered each major system. Secondly, strong agricultural potential, on the basis that improved transportation would be of greatest immediate benefit to those communities/ households that are currently producing an agricultural surplus and/or cash crops. Thirdly, representative accessibility, in order to accurately reflect not only those with good potential access to markets, but also those with less good access.

On the basis of these pre-determined criteria, staff from the district administration's agriculture department and the study team selected three sub-counties. Within each, one village was selected, on the basis of representativeness of the sub-county, for conducting a one-day rapid participatory rural appraisal.

Study Implementation. Implementation of the major part of study took place in two phases. The first phase was conducted through one-week missions to each of the target districts during September and October 2002. Each mission was structured as follows:

Day	Activities
1.	• Arrival at district headquarters • Meetings with government staff • Meetings with selected NGO, CBO and Donor staff • Organisation of study team • Selection of sub-counties
2	• District Infrastructural and Service Investigation • Preliminary visits to each sub-county, and selection of study communities with LCIII and LCI heads
3	• Rapid participatory assessment of farming systems, travel and transportation uses, priorities and needs with community 1. • Review of findings, triangulation and clarification of data[7]
4	• Rapid participatory assessment of farming systems, travel and transportation uses, priorities and needs with community 2.

[7] See Appendix 4 for the daily schedule of activities and persons responsible

	• Review of findings, triangulation and clarification of data
5	• Rapid participatory assessment of farming systems, travel and transportation uses, priorities and needs with community 3. • Review of findings, triangulation and clarification of data • Debriefing of government, NGO and CBO Staff • Return to Kampala

Draft reports were written on the basis of these missions, with two specific aims. Firstly, to draw out the main issues on farming systems, transportation structures and local priorities. Secondly, to highlight gaps and issues to be investigated through the second phase study.

The second phase study focused on livelihoods, transportation and linkages between the two, administered through a structured household questionnaire survey. Whilst addressing issues raised by the findings of the first phase of studies, by its nature, the household study aimed to investigate a number of issues at that unit of account, collecting at a sufficiently large sample size to be able to be statistically confident of the findings.

The sampling for the household survey was based on the selection of sub-counties and communities during the first phase studies. Three communities were selected from each sub-county, one being the previously selected, followed by two neighbouring ones or communities with similar characteristics[8]. With three sub-counties in each district, a total of nine villages were selected from each district, thus 27 across the three districts. Stratification within each community was based upon random selection, with approximately 15 households surveyed in each. The total sample size across all three districts was 397.

The household survey, conducted during November and December 2002, was managed by one member of the study team (i.e. Ms H Iga). Enumerators with previous experience of conducting household questionnaire surveys were selected and trained within each district, to ensure they spoke the requisite language. The data was entered into a Microsoft Access spreadsheet, and then transferred to SPSS for statistical analysis.

Data Quality Evaluation and Research Process Limitations. Whilst discussions in advance of implementation identified the limited time and potentially broad nature of the investigation, it was found that many anticipated method and process limitations were offset by the complimentary range of expertise of the research team and the early examination of the problems experienced by researchers involved in qualitative research in Uganda[9]. This reduced the risk of problems usually associated with PRA such as:

[8] Selected as potential controls to the target communities

[9] A number of the team members had experience of designing and conducting qualitative investigations in Uganda. Use was also made of the experience from the UPPAP.

- Lack of attendance at the community meetings due to other commitments. Although it is ideal to schedule these at the start of the first day of the study process for participatory assessment and guidance purposes, community meetings were scheduled according to the community's requirements.

- The monopoly of community or focus group meetings by certain members of the community[10].

- Community expectations – although simply by being there expectations were initially raised, the team at many junctures explained their presence and the project in a manner that limited problems associated with raised expectation.

Due to the anticipation of and arrangements made for some of these predicted problems it is believed that the quality of the data collected is high. However, some factors were beyond the study team's control, which has resulted in process problems and quality limitations of the data. These are surmised as:

- Time restrictions – Due to the relatively large size of the team (i.e. 5 – 7 members from outside the District) first phase missions were limited to one week in each district. This meant that only one full day could be spent in each community. Whilst sticking to the initial choice of three sub-counties / communities per district this enabled a spectrum of agro-ecological and thus farming systems to be selected, with hindsight it may have been preferable to reduce the number. Nevertheless, during the course of community PRAs, the research team was split into two sub-teams allowing a wider coverage of different livelihoods and transport related aspects.

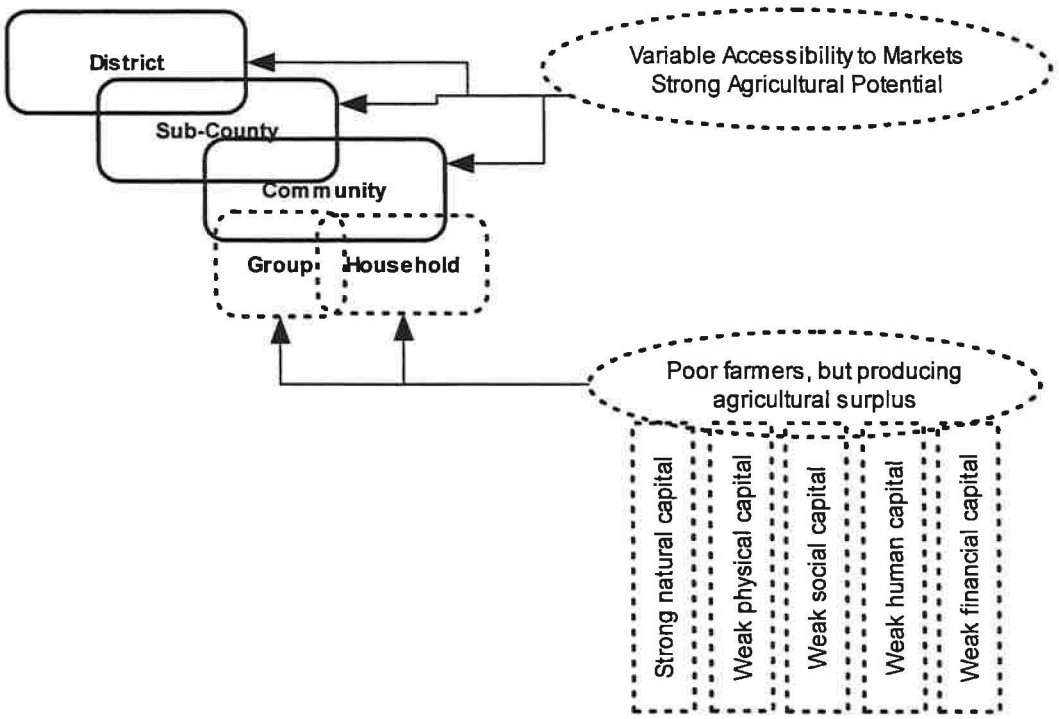
- Transport Knowledge and Use PRAs. As the first exercise, high attendances were found at the start. However, in each case, community members were found to drift in and out, participating in some parts of the exercise and not others. Whilst this is to be expected, it did cause some difficulties with the aggregation of the findings.

[10] It was noted, for example, the UPPAP project it was found that 'the reverence for elders and local leaders encouraged them to monopolise contributions during the PRA meetings'.

Client Characterisation

The clients of this action-research project are poor farmers who produce an agricultural surplus, but are constrained by the lack of means of transporting this produce to market. Within this context, client characterisation has been structured through a two tier process of community selection followed by then intra-community investigation. This is illustrated in Figure 8.

Figure 8. Client Characterisation



Firstly, the selection of districts, sub-counties and communities for the action-research. The criteria for selection were twofold: agricultural productivity and geographical remoteness. In the case of the former critierion, in view of the target clients, districts, sub-counties and communities with relatively high-levels of agricultural productivity were selected. In the case of the remoteness, a spectrum of variable accessibility was sought at each level. This will enable the wider application of the lessons from the action-research.

Within each community, the characterisation process was initiated through two phases. First, rapid participatory assessments to investigate and understand structures, processes and patterns pertinent to community and group crop marketing and transportation issues and priorities. These assessments (detailed in the methods section of this report) provided the basis for household-level assessments.

Ultimately, the clients within the target communities are poor farmers producing an agricultural surplus. The concept of poverty, and definitions of 'the poor' vary in accordance with the perspective and objective of those doing the defining, and the methods used. Recognition that defining poverty in traditional consumption and expenditure terms is insufficient on its own to address the needs of the poor

themselves has led to the inclusion of human and social welfare indicators in development indices and poverty alleviation programmes. Further, self-characterisation of poverty, gathered from the poor themselves, has become increasingly central to sector and programme planning, with the recognised aim of including these 'voices of the poor' not only in terms of illustrating their needs, but in an interactive process of planning for development.

Most poverty characterisation in Uganda has been undertaken using quantitative or qualitative methods. The findings have resulted in two patterns and trends of poverty that appear to be contradictory, a dichotomy that is partly related to the methods of data collection[11]. Nevertheless, it is commonly accepted that a degree of complimentarity can be drawn between the two approaches (Marsland et al 2000, McGee, 2000; Hentschel, 1998).

The approach to client characterisation taken within this action-research project has been to draw upon the findings of participatory poverty assessments (PPAs) through the lens of livelihoods framework assets as a basis for determining the criteria for quantitative investigation[12]. Table 4 presents these characteristics common to the PPAs reviewed grouped under the livelihoods assets structure, and identifies the household survey entry points.

Generating a comprehensive data set on the livelihood characteristics of male and female-headed households in the target communities, enables the investigation of a number of factors. Primarily, potential clients of the action research can be identified as those that have strong agricultural marketing potential, yet are weak in other asset areas. Secondly, this household level data enables linkages to be identified between livelihood status and transportation, with the household survey also including a detailed investigation of travel and transport patterns. When reviewed alongside the previous appraisals of community-group priorities, a strong picture is revealed.

[11] Analysis of the Uganda National Household Surveys (UNHS) over the period 1992/3 to 1997/8 showed a national decrease in poverty from 56 per cent to 44 per cent (Appleton, et al., 1999). However, the participatory poverty assessment of 1998/9 concluded that in some areas the poor are getting poorer (UPPAP, 1999). An attempt to justify this apparent disparity concluded that the assumption of the UNHS that a rise in household consumption indicates an increase in household well being requires dissagregation; with the inclusion of such items as alcohol consumption implying a "perverse increase in consumption.. [thus] .. not greater well being but the opposite" (McGee, 2000:15).

[12] Due to time restriction definitions of poverty were not sought directly from the members of the study villages, rather, a set of poverty indicators were drawn from PPAs conducted under the UPPAP process and complimentary studies.

Table 4: Definition and Characteristics of Household Capital Assets

Capital Asset	Definition	Characteristics[13]	Household Survey
Natural	Natural resources made up of air, land, water, soils, minerals, plants and animal life that people use. They provide goods and services, either without people's influence (e.g. forest wildlife) or with their active intervention (e.g. farm crops. Natural capital can be measured in terms of quantity and quality (e.g. acreage, head of cattle, diversity and fertility).	• Cultivable land ownership • Crop production for food security • Ownership of livestock	• Size of land cultivated • # and type of crops produced • # and type of livestock owned
Human	Human capital is that part of human resources determined by people's qualities, e.g. personalities, attitudes, aptitudes, skills, knowledge and physical, mental and spiritual health.	• Ability to access/ afford education & health • Age/ Sex	• # of members in school • Expenditure on education and health • Age/ Sex
Financial	Financial capital is a specific and important part of created resources. It consists of the finance available to people in the form of wages, savings, supplies of credit, remittances or pensions.	• Income from farm , off-farm and non-farm sources • Income from remittances	• Quantities of crops marketed • Number and type of Income-Generating Activities
Physical	Physical capital is derived from the resources created by people, such as buildings, roads, transport, drinking water, electricity, communications systems etc., as well as equipment and machinery for producing further capital. It thus comprises producer goods and services, and also consumer goods available for people to use.	• Living in a proper shelter • Ownership of productive goods • Ownership of consumer goods	• Number and type of productive and consumer goods owned
Social	Social capital is defined as that part of human resources determined by the relationships people have with others. These relationships may be between e.g. family members, friends, workers, communities and organisations, and can be defined by their purpose and qualities such as trust, closeness, strength and flexibility.	• Social support networks	• Membership of community groups • Linkages with extension/ credit service agencies

[13] Distilled from various participatory poverty assessments conducted across Uganda, including: UPPAP, 1999, Smith and Zwick, 2001

Table 5: District Background Information - Overview

	Iganga	Kasese	Katakwi
Location and Administrative setting	Iganga District is located in Eastern Uganda neighbouring Jinja, Kamuli, Bugiri, Mayuge, Pallisa, and Tororo Districts. To the south it borders Kenya in Lake Victoria.	Kasese District is located in Western Uganda next to the border with DRC, neighbouring Kabarole, Bundibugyo, and Bushenyi Districts.	Katakwi is located in North Eastern Uganda and is a 'new' District which was created from Soroti District. It borders Lira, Soroti, Kumi, Moroto and Nakapiripirit Districts.
Sub-counties surveyed as part of the study	Bukanga Ivukula Makuutu	Kyabarungira Mahango Nyakiyumbu	Asamuku Orungo Kapujan
Population (2002 census)	715,000 Majority group: Busoga	530,000 Majority group Bakonjo Major security problems between 1995 – 2000 due to insurgency.	267,000 Majority group: Iteso Some security problems due to cattle raiders, and insurgents (1986 – 1999).
Natural resources	Ferralitic soils dominate in the southern and western parts of the District; Quartzitic and lateritic soils in the eastern and northern parts. Rainfall patterns: On average 1,250 mm per annum during two rainy seasons. Lake Victoria	Predominantly acidic soils in the high altitude mountainous region, and sand clay loams in the plains of the rift valley Rainfall patterns: 800 – 1,600 mm with the highest rainfalls in the mountains Lakes Edward and George	Mainly ferrallitic soils which are well drained and friable. Rainfall patterns: Approximately 1,000 mm Lakes Bisina and Opeta (both are relatively small and covered with waterweeds)
Topography	Predominantly flat, low-lying terrain	Combination of flat terrain in the plains of the rift valley, and hilly to mountainous terrain towards the border with DRC in the north-west.	Predominantly flat terrain, with gently undulating slopes in some areas
Road connectivity	Iganga lies on the main road axis between Kampala and Kenya. Amongst other things this has stimulated demographic and economic growth.	Kasese is relatively remote in the Western part of Uganda with good roads in the plains, and difficult accessibility in the mountains.	Katakwi is relatively remote in the North Eastern part of Uganda and characterised by the absence of paved roads

DISTRICT BACKGROUND INFORMATION AND STUDY AREAS

Table 5 provides an overview of the key characteristics of the Districts covered by the research. The information provided and analysed in sub-sequent sections on agricultural farming and marketing systems and related transport needs ought to be viewed in this context. The following section provides the details of the districts and the study areas surveyed.

Iganga District

Location and Size. Iganga District is located in the central region of Uganda. The district, sub-divided and re-constituted in 1997, now borders the Republic of Kenya to the east (in Lake Victoria), Bugiri District to the east, the districts of Mukono, Jinja and Mayuge to the west, Kamuli to the north and Tororo and Pallisa to the north-east.

Population and Settlement. The 2002 Population Census placed the district's population at 714,635 up from 489,627 in 1991 (taking reconstitution into account). Located within a habitable land area of 4,800 km^2 (pre-reconstitution), and with an average growth rate of 3.5% per annum, Iganga District has one of the highest population densities in Uganda. The majority of residents are from the Basoga ethnic group (67% in 1991), with Banyole, Samia, Iteso and Badhama constituting the majority of the rest.

Whilst the district remains predominantly rural (over 95% in 1997), and characterised by dispersed rural homesteads, there is considerable population growth in local administrative centres (at sub-county and district level). The district has one classified urban centre, Iganga, which has witnessed a growth rate of 7% per annum over the past 40 years (1959-1991). The principal cause of urban growth is the Kampala-Mombasa highway which passes through the town, and has stimulated development along this corridor. With the dereliction of the railway, road traffic volumes, and the consequential development of the service industry, has thrived in this centre.

As a whole, the district (as configured until 1997) has a total road length of 2113 km. 150 km is tarmac and government maintained, the remainder is marrum and soil compacted, and is maintained by district administration and local communities.

Agro-ecology and Climate. The district is characterised by predominantly flat, low-lying terrain. Ferralitic soils, coming from the gneiss and granite bedrock, dominate the southern and western regions of the district. Consequently, these regions are low to medium productivity, used for producing cotton, tea and robusta coffee. The eastern and northern regions of the district are characterised by quartzitic and lateritic soils, with typically low fertility, and thus historically used for cotton production.

Mean average rainfall for the district is 1250mm per annum, falling during two seasons: April to May, and September to November. Rainfall occurs on average for 100-130 days per annum, draining south to Lake Victoria. The main wetlands exist in the eastern region of the district. The district's vegetation is predominantly savannah

and forest, the latter declining due to clearing for farming, timber, grazing and fuelwood.

Land use and tenure. Farming is the main land use in the district. In 1997, small-scale subsistence agriculture occupied approximately 85% of the land area, woodland 6%, high forest 4%, bushland 3% and large-scale farming, urban use and tree plantations combined 1%. (NEMA, 1997).

Likewise, approximately 85% of all households in the district are engaged in agriculture (NEMA, 1997). The largest proportion of cultivated land is used for traditional foods crops, mainly cassava, maize, potatoes, millet, groundnuts, bananas, sorghum, rice, vegetables, fruits. Cash crops, mainly cotton and coffee, are also cultivated.

Customary land tenure predominates in the district, leasehold and freehold tenures are uncommon outside of the urban areas. No formal land use plan exists in the district (at least until 1997), which in combination with high population density, has been identified as contributing to land degradation (NEMA, 1997). This is pronounced in the rangeland areas through over-grazing, fuelwood and construction material collection, and through the conversion of wetlands to rice production.

Economy. Agriculture is the mainstay of the Iganga district economy, combining subsistence with semi-commercial farming. With the decline of the traditional cash-crop marketing system (predominantly coffee and cotton), food crops and non-traditional cash crops have risen in production, including sesame, soyabeans and some fruits. Constraints to the growth of the agricultural sector centre on population-land pressure, post-harvest losses (lack of adequate storage facilities) and an undeveloped marketing system as a replacement for the government-run co-operatives.

Manufacturing within the district is centred around a number of factories that process cotton, coffee and grain; timber yards (sawing and processing) and distilleries. However, the biggest growth industry is services, centred around the Iganga Town retail trade, small-scale manufacturing and repair and transportation.

Livestock. Various types of livestock and small ruminants are present in Iganga, located mainly in the north and east of the district. Within this region, households typically own in the range of 3-15 head of cattle, 2-10 goats, 2-5 sheep and 10 or more chicken (NEMA, 1997). However, livestock numbers have fallen due to the increase in cultivated area (thus, reduced grazing land) as a consequence of population increase. Nevertheless, livestock represents a crucial source of meat, milk and milk products, and is an important form of financial and socio-cultural capital.

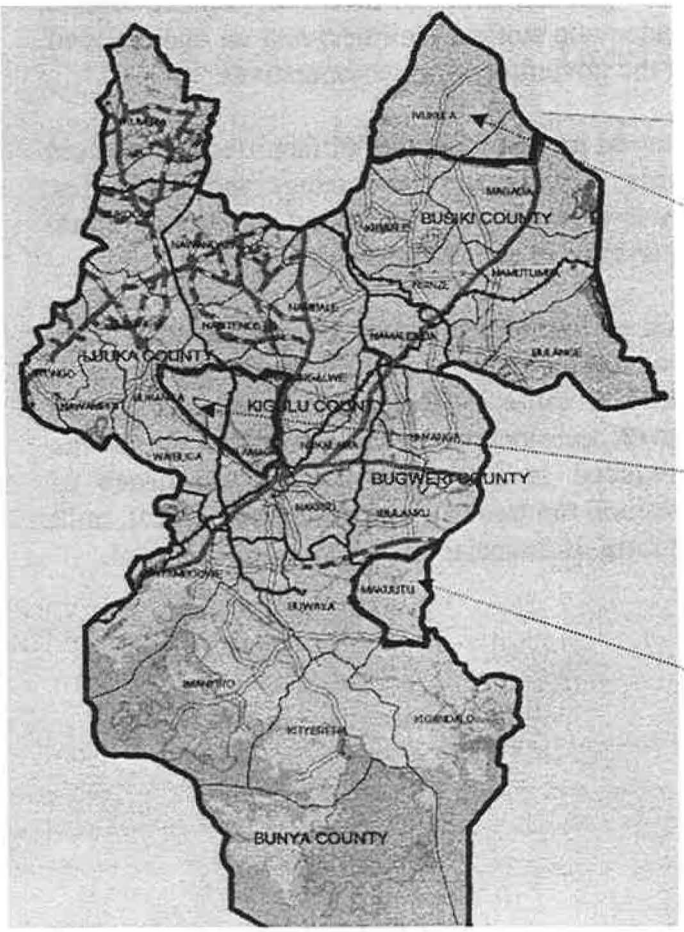
Study Area

The study targeted two levels of aggregation as a basis for data collection on the utilisation and needs in travel and transport for food produce marketing. Firstly, the district headquarters, Iganga Town, as the centre of institutional and service provision, including district government departments, non-governmental agencies, credit organisations, and transport/ crop marketing companies.

Secondly, the village component of the study focused on three sub-counties (LC IIIs), selected on the basis of a set of criteria. Firstly, representativeness of the farming systems within district, to ensure the study covered each major system. Secondly, strong agricultural potential, on the basis that improved transportation would be of greatest immediate benefit to those communities / households that are currently producing an agricultural surplus and/or cash crops. Thirdly, representative accessibility, in order to accurately reflect not only those with good potential access to markets, but also those with less good access.

On the basis of these pre-determined criteria, staff from the district administration's agriculture department and the study team selected three sub-counties. Within each, one village was selected, on the basis of representativeness of the sub-county, for conducting a one-day rapid participatory rural appraisal. Map 1 and the accompanying figure illustrate the sub-county and village selection.

Map 1. Iganga District Sub-county and Village Selection



Sub-County/ Village	Farming System	Access
Ivukula S/C (north-east) Kisega village	- cotton - g-nuts - rice/ wetlands - livestock	Medium
Bukanga S/C (central-west) Bigunho village	- coffee - beans - pineapple - cocoa - sugarcane	Good
Makuutu S/C (south-east) Naitandu village	- maize - coffee - beans - rice - pineapple - cotton	Remote

Kasese District

Location and Size. Kasese District is located in western Uganda. The district is bordered to the north by the district of Bundibugyo, to the north-east by Kabarole, to the south across open water by Bushenyi and to the west by the Democratic Republic of Congo. The total areas of the district is 3,205km^2, of which 15% is water (Lakes George and Edward) and a further 48% is protected national park land (Queen Elizabeth and Rwenzori parks).

Population and Settlement. The 2002 Population Census placed the district's population at 530,018 up from 343,601 in 1991. Located within a habitable land area of 1,187 km^2, and with an estimated growth rate of 2.1% per annum (1991-95), Kasese has one of the highest population densities in Uganda. However, the district's population and thus density has fluctuated considerably over the past 30 years due to periods of armed insurgency (particularly the 1960s and 1990s), and the resource pressure on land. These population movements have stabilised over the past few years.

The Bakanjo are the dominant ethnic group of the district (81%), followed by the Basongora (6%) and Banyabindi. The Bakonjo are located mainly in the foothills, and are predominately cultivators. This contrasts with the Basongora who are traditionally pastoralists, living mainly on the plains. The population of Kasese is located mainly in the rural areas (88%), with the remainder located in one of eight urban centres. Kasese Town is the largest of these, with an estimated population increase over the period 1991-2000 of approximately 18%. The rate of growth across these urban centres has exceeded the rate of at which urban planning proposals have been implemented, causing mounting pressure on physical and environmental resources, and upon the supply of public utilities (National Environment Information Centre, 1997)

Transport Network. The majority of roads in Kasese District are concentrated in the central part of the district, running in a north-eastly direction, sandwiched between the Rwenzori mountain range to the west and Queen Elizabeth National Park to the south and east.

The total road network covers a distance of approximately 564 km. Six of the roads are trunk, covering approximately 160 km within the district. Three of these roads are heavily used, handling the movement of goods to and from Fort Portal and the DRC. Only two of the six roads are tarmac, the rest are murram. The roads generally are in a poor condition, with terrain being one of the stated challenges in their construction, rehabilitation and maintenance (National Environment Information Centre, 1997). The plain roads are susceptible to flooding from mountain run-off, whilst erosion causes continuous problems for the mountainous roads.

The majority of Kasese's feeder roads were constructed during the 1980s in an attempt to improve the accessibility of mountainous communities to public services and markets located predominantly in the urban centres and to the inter-district trunk road network. However, it is noted that in 1995, roughly 50% of all roads in the district were not motorable by 2-wheel drive vehicles, and only 19% of feeder roads. Nevertheless, efforts by rural communities to open-up and maintain village access

roads was found to be considerable (National Environment Information Centre, NEIC, 1997).

Agro-ecology and Climate. The district is characterised by two district geomorphological zones, the north-west which is mountainous terrain, and the south-east which is plain rift valley. The Rwenzori mountain range rises to 5110m above sea level (Mt. Stanley) and is composed of steep-sided escarpments, in contrast with the plains of the south and east which lie between 900-1800m above sea level. The soils found in the high altitude mountain region are predominantly acidic; low to low-medium productivity and are suitable for coffee growing. The rift valley soils are predominantly sand clay loams, with low-medium productivity and are suitable for cotton growing.

The bimodal rainfall pattern in the district involves short first rains between March and May, and longer rains between August and November. Annual rainfall falls within the range of less than 800mm to 1,600mm and is heavily determined by altitude. Thus, the pattern across the district is broadly an increase in rainfall towards the north-west where the higher altitude terrain is found.

A variety of vegetation types exist across the district, with the mountainous north-west dominated by high-altitude moreland, heath, bamboo and moist semi-deciduous forest. The foothills and plains are characterised by savannah, consisting of a mixture of forest remnants, savannah trees and elephant grass. Swamps are found around the peripheries of the lakes.

Land use and tenure. Agriculture is the main land use in the district, with over 85% of the population deriving their livelihood from subsistence agriculture (National Environment Information Centre, 1997). Mixed farming is practised across agro-ecological zones: maize, beans and cotton are grown in the plains, coffee, bananas, passionfruit, and cassava in the foothills and mountain slopes. Inter-cropping is used extensively, combining cassava and beans, banana and beans, maize and beans, maize and groundnuts, and millet and maize. According to NEIC (ibid), farm-holdings range from 0.4-1.2 hectares. Irrigation schemes are used particularly in the growing of vegetables, particularly by the few large-scale farmers located mainly in the north-east of the district.

Customary tenure still predominates in the district, with land rights regulated by local customs linked to family lineage and inheritance. Customary ownership has been recognised by law (Constitution, 1995) although has been seen to fail to deal with increasing problems of land fragmentation, competing use of common property between pastoralists and cultivators and the decline in soil fertility. Leasehold and freehold tenure also exists, granted by the Land Commission or Urban Authority, predominantly for development purposes.

Livestock and Fishing. Cattle is the main type of livestock breed in Kasese, with over 47,000 head estimated in 1995 (National Environment Information Centre, 1997), in comparison with 35,000 goats and 3,000 sheep. The cattle population has increased substantially between 1991-1995 from just under 14,000 to the currently estimated level. However, as with the human population, instability in the region has led to considerable fluctuations in the levels.

Communal grazing is the dominant practice, although this is declining as the nomadic tendencies of pastoralists are in decline. One reason given for this is the decline in the available area of pasture as the human population increases. Nevertheless, livestock represents a crucial source of income through the sale of hides, meat and milk.

Fish are harvested from lakes Edward, George and Kayanja Kabalaka, the Kazinga Channel, Kayatete swamps, river Nyamugasani and fish ponds. Numerous species of fish exist in the district's water channels, and traditionally represented the main source of protein for the population alongisde incomes for those engaged in harvesting or spin-off enterprises.

However, fish stocks have been declining since 1971 from 11,000-13,000 metric tonnes (MT) to approximately 2,200 MT in 1994. Over-fishing and civil unrest have been attributed as the main reasons for this decline (National Environment Information Centre, 1997). The majority of fish is caught and sold within the district, with approximately 5% salted, smoked and exported to the DRC (1995 figure). Up until the collapse of the Uganda Fish Marketing Corperation in 1973, fish was frozen, salted and exported to DRC and marketed in Kampala in much higher volumes. Currently, the majority of fish-related enterprise activities are small scale and dispersed.

Economic Overview. The population of Kasese is predominantly rural (88%), with an estimated 85% involved in farming, 4-5% in livestock rearing and 10% comprising industrial workers and civil servants (National Environment Information Centre, 1997). Petty trading occurs across the district, concentrated on the sale and exchange of natural resource products. The industrial sector is small, but growing, centred around agro-processing industries (maize, animal feeds, coffee and cooking oil), and consumer products (mattresses, soap etc). The potential prospects for trade and industrial growth are quite strong, with the stability currently experienced, and the government's investment in public services (schools, health posts and roads). Kasese Town is located in a strategic position bordering DRC and with a good trunk road connection across Uganda to the capital and beyond to Tanzania. Economic liberalisation is expected to open up opportunities of the reinvigoration of the export market trade, particularly coffee.

Study Area

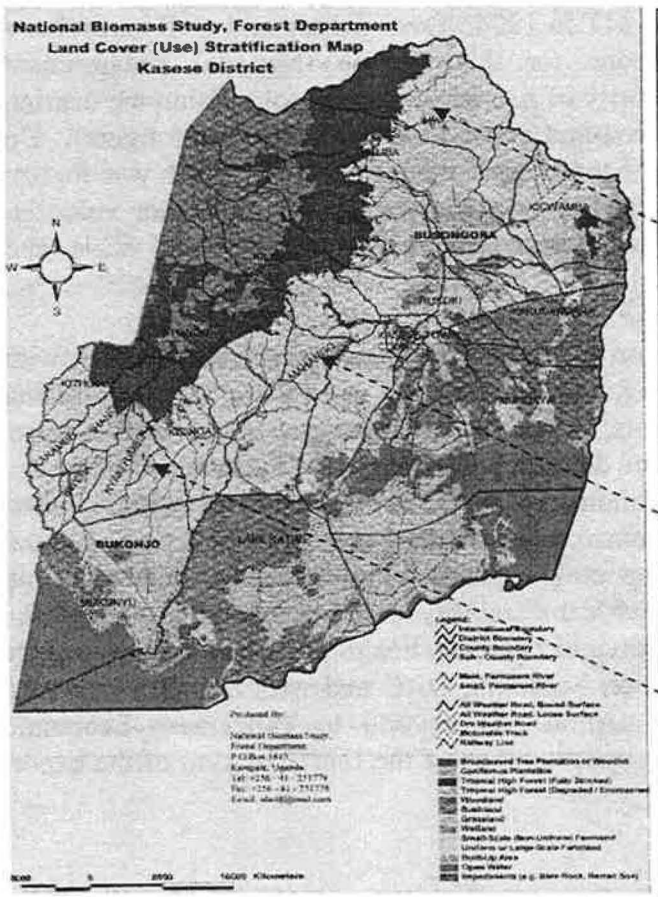
The study targeted two levels of aggregation as a basis for data collection on the utilisation and needs in travel and transport for food produce marketing. Firstly, the district headquarters, Kasese Town, as the centre of institutional and service provision, including district government departments, non-governmental agencies, credit organisations, and transport/ crop marketing companies.

Secondly, the village component of the study focused on three sub-counties (LC IIIs), selected on the basis of a set of criteria. Firstly, representativeness of the farming systems within the district, to ensure the study covered each major system. Secondly, strong agricultural potential, on the basis that improved transportation would be of

greatest immediate benefit to those communities/ households that are currently producing an agricultural surplus and/or cash crops. Thirdly, representative accessibility, in order to accurately reflect not only those with good potential access to markets, but also those with less good access.

On the basis of these pre-determined criteria, staff from the district administration's agriculture department and the study team selected three sub-counties. Within each, one village was selected, on the basis of representativeness of the sub-county, for conducting a one-day rapid participatory rural appraisal. Map 2 and the accompanying figure illustrate the location of the sub-counties and villages selected for the research.

Map 2: Kasese District Sub-county and Village Selection



Sub-County/ Village	Farming System	Access
Kyabarungira S/C (north) **Kaswa II** village (with reps of Kaswa I, Mghasa and Mbata villages)	- Maize - Beans - Coffee - Bananas - Passion fruit	Mountains Poor access
Mahango S/C (central) **Nyamusule** village	- Coffee - Passion fruit - Bananas	Mountains Poor/ average access
Nyakiyumbu S/C (south-west) **Kitakurura** village	- Cotton - Coffee -Soya-beans (fish)	Mountains and plain. Variable access

Kaswa II, and the neighbouring villages of Kaswa I, Maghasa and Mbata (who had representatives that participated in the study) are located in Kyabarungira sub-county, in the mountains bordering Rwenzori Park and the DRC. Access from and to the villages is currently very limited, with the main road only passable by a powerful 4-wheel drive vehicle[14]. A new road is currently under construction, which should cut out some of the steepest parts of the existing road.

According to the aural and written records, Kaswa II and the neighbouring villages were first inhabited in 1905. In 1962 the village was hit by severe landslides and numerous deaths, whilst during the mid-1960s tribal conflicts[15] led to several deaths, and the destruction of homes. In 1977, the area was incorporated in the newly created district of Kasese. In 1992, the upper slopes of the Rwenzori range were gazetted as the Rwenzori Mountains National Park, with a consequential loss of cultivable and hunting land for the village inhabitants. The gazetting was felt to have had a major impact on the livelihoods of the residents, who have not been compensated for the loss of this cultivable land.

Civil conflict during the period 1996-2001 led to widespread displacement, with the majority of inhabitants resettled in camps near to Kasese Town. This displacement had a seriously detrimental effect on the livelihoods of the village population, depending on food aid and with limited shelter in the camps, whilst personal property and land back in Kaswa II was destroyed or left untended.

The majority of trade from the 1970s to 1990s flowed between this region of Uganda and the DRC (Zaire as was) due to poor internal communications networks within Uganda. The majority of residents during this period found it easy and more profitable to trade with Zaire. Construction and reconstruction of infrastructure, and a general improvement in the economy of Uganda during the 1990s has reversed this process, with the majority of trade now conducted within the district, and with other parts of Uganda. With the locale, the villages are located within 0.5-3km of each, whilst the nearest markets are Kibito (17km) and Kichamba (16km), Kitume (15km) and Kabatunga (16km). Coffee, one of the cash crops grown, is transported to Katume and Kabatunga.

Average household size in the villages was estimated at 9-10 persons, of which 4 are economically active (parents, and two of the older children). The elders of Kaswa II estimated that the village has 140 households, thus an estimated village population of approximately 1,300 people. The number of households in the neighbouring villages falls within the range of 180-290. In each case, total average farm sizes were estimated to be between 2-4 acres.

Nyamusule village is located in Mahango sub-county, approximately 2,300m above sea level, located close to the border with the DRC and Lake George. The village was first settled in the 1960s after the tribal insurgency, at which point there were few water sources, and poor accessibility. The majority of trading, as with the many parts of the district, was conducted with the DRC due to the poor internal links. During the 1970s and 80s, the community became reasonably settled, with the growth and sale of

[14] The study team had to get out of the 4-wheel drive vehicle on more than one occasion to enable it to pass up the mountain road.
[15] Rwenzururu uprising, during which the Bakonzo were attempting to secede from the Tooro Kingdom

coffee, and the protection of spring wells for drinking water. During the 1990s, civil conflict led to looting, with the majority of the population displaced either permanently in camps, or temporarily running into the bush, and returning when it felt safe.

An unsealed road connecting the village was completed in 1999 after three years of intensive construction organised by a local chairman and using village labour. Locally raised taxes paid for a professional surveyor, and the men from the village and the neigbouring villages gave three days per week to hard labour on the roads. The road has more recently come under government control, who are responsible for maintenance. Pick-ups are hired by buyers and traders to come to the village, but no public transport is available.

Average household size was estimated to be in the range of 5-10 persons, with approximately 290 households in the village, meaning a total population falling in the range of 1,450-2,900. Average farm sizes were estimated to be 1-2.5 acres.

Kitakurura village, located in Nyakiyumbu sub-county, is situated in the mountains of the south-west of Kasese District. The population split their time between this permanent settlement, and a temporary settlement constructed in the rift valley, close to Lake Edward and bordering Queen Elizabeth National Park and close to the DRC. The villagers' cotton fields are located close to the temporary settlement, and constitute the main source of income for the majority of households. Whilst some villagers have built their own homes in both settlements, and own cotton fields in the plains, the majority rent accommodation in the temporary settlement and rent land for growing cotton.

Fields for the production of other food and cash crops and the schools are located in the mountains. Consequently, men from the village are the most mobile between the two settlements, whilst the women are mobile in and around both villages engaged in productive and domestic work. The children spend the majority of time in the permanent village, with access to the schools.

The average household size in the permanent village is 8 persons, with an estimated 250 households, thus a total population of approximately 2,000.

Katakwi District[16]

Location. Katakwi district is located in North Eastern Uganda between longitudes 53.9^{0}E-63.6^{0}E and latitudes 18.2^{0}N. The district is bordered in the East and North-East by Moroto and Nakapiripirit districts respectively; in the South by Kumi district and in the West and North-West by Soroti and Lira districts respectively. The district headquarters Katakwi, lies 52 km on Soroti-Moroto road and 380 km from Kampala, the capital of Uganda.

Administration. The district consists of three (3) counties, fifteen sub-counties and eighty parishes. There are a total of six hundred and forty two villages (642) and 28,445 households. In addition to the administrative headquarter Katakwi, there are 13 trading centres in the District.

As per 1998/99 revenue estimate, 94% of the district revenue comes from the Central Government and Donors and NGO funds. The district can only raise 6% of its budget requirement. Graduated tax is a major source of district revenue.

Geographical Features. The district covers about 4,430 sq km of which 4250 sq km is land and 177 sq km is water. Only 1500 sq km is under cultivation and 5745 hectares is under forest. The soils, mainly of ferrallitic type are well drained and friable. The landscape is generally a plain with gently undulating slopes in some areas.

Population. According to the 2002 Population Census, the total population of the district is 267,304 up from 144,597 in 1991. As a result, the population density in 2002 is of the order of 60 inhabitants per sqkm. The dominant ethnical group is Iteso. Other groups include Karamajong (pastoralists).

Economic Activities. The main economic activities are agriculture, trade, fishing and small scale industry. In 1998 crop production was as indicated in Table 6.

Table 6: Crop Production in Katakwi, 1998

Food Crops (tonnes)		Cash Crop (tonnes)	
Cassava	16,000	Cotton	275 (sold 100%)
Sorghum	5,985	Sunflower	261 (sold 100%)
Groundnuts	2,625	Rice	777 (sold 100%)
Cowpeas	281		
Sweet potatoes	10,000		
Finger millet	3,150		
Green grams	188		
Soya beans	875		
Simsim	58		

[16] Mostly based on information from 1999 (Kleih, Odwongo, and Ndyashangaki, 1999)

Livestock. Cattle, goats and sheep and pigs are kept on free range method. As per Table 7, this is a major source of income as indicated by the number of animals sold per month.

Table 7: Livestock Production and Sales in Katakwi, 1998

Type of Livestock	Population	Average sold per month
Cattle	40,424	200
Goats	85,893	500
Sheep	14,971	100

Fisheries. Fish production is mainly from the two lakes, Bisina and Opeta. There are fifteen (15) landing sites with about 200 fish mongers. In addition to the lakes, there are also eight fish ponds.

Transport Network. The district has a total of 579 km of trunk and feeder roads. Trunk roads, maintained by the Central Government constitute 12.6% i.e. 73 kms and feeder roads constitute 87.4% i.e. 506 km which is maintained by the district. In 1999, of the 506 km feeder roads, 71.3% (i.e. 361 km) were inaccessible and required major rehabilitation.

Other Infrastructure. The district is not connected to the national electricity grid. Poverty Alleviation Project (PAP), Presidential Commission for Teso (PCT), ActionAid, Youth with a Mission (YWAM), SOCADIDO Soroti Catholic Diocese Development Organisation and Katakwi District Development Programme (KDDP) are the only development organisations operating in the district and some are sources of credit.

Study Area

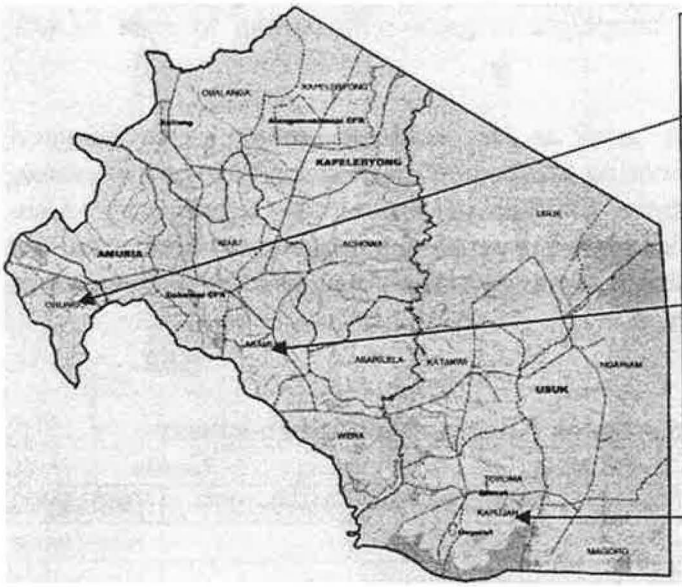
The study area in Katakwi targeted two levels of aggregation as a basis for data collection on the utilisation and needs in travel and transport for food produce marketing. Firstly, the district headquarters, Katakwi Town, as the centre of institutional and service provision, including district government departments, NGOs, credit organizations, engineering workshops and transport/crop marketing companies.

Secondly, the village component of the study focused on three sub-counties (LC IIIs), selected on the basis of set criteria. Firstly, representativeness of the farming systems within the district, to ensure the study covered each major system. Secondly, strong agricultural / fishing potential, on the basis that improved transportation would be of greatest immediate benefit to those communities / households that are currently producing an agricultural / fishing surplus and / or cash crops. Thirdly, representative accessibility, in order to accurately reflect not only those with good potential access to markets, but also those with less good access.

On the basis of these pre-determined criteria, staff from the district administration's production, engineering and planning departments under the Chairmanship of the Chief Administrative Officer (CAO), and the research team selected three sub-

counties. Within each, the LCIII Officials and the study team, on the basis of representativeness of the sub-county, for conducting a one-day rapid participatory rural appraisal, selected one village. Map 3 and the accompanying fugure illustrate the sub-county and village selection.

Map 3: Katakwi District Sub-County and Village Selection



Sub-County / Village	Farming System	Access
Orungo S/C (South-centre Katakwi) Ogongora Village	Cotton Rice Soya Beans Millet Fishing	Remote
Asamuk S/C (Central Katakwi, west of Katakwi Town) Adodoi Village	Green Grams Cassava Ground-nuts	Good
Kapujan S/C (Apule Village)	Fishing Cassava Ground-nuts Millet	Medium

Adodoi village lies on the flat lands in the western centre part of the District in Ajaki Parish in the Sub county of Asamuk of Amuria County. The population of Adodoi village is 650 inhabitants. There are 152 households in the village with 4 people in each household [17]. The eldest person among the informant group was born in the village in 1940.

Almost all the district roads that were seen during the course of the PRA require regrading. There are also trouble spots where too much water has washed away the banks of the roads.

From 1940 up to the seventies the village had abundant food crops and experienced no famine during the period. The food crops grown during the period included cassava, millet, sweet potatoes, cowpeas and sorghum with groundnuts grown for sauce. In 1994, famine was experienced because households sold most of their food to buy oxen for ploughing.

Then cotton and bulrush millet were the two cash crops for the village. Both crops were sold to Indians who owned cotton ginneries and the retail shops in the surrounding neighbourhood of Amucu (6 km) and Amuria (10 km), and Soroti town (45 km). Cotton was transported to collection centres by head loading or sledges pulled by oxen. Each sledge pulled 6 bags of 20 kg each. In 1955 when the

[17] According to the questionnaire survey the average household size of the District was 7.9, including children.

cooperative societies started buying cotton, the produce was transported to Ajaki (3 km) and Golokwara (1 km) collection centre and thereafter by lorries to ginneries. Surplus bulrush millet was transported to market strictly by head loading.

Farmers stopped growing cotton when the cooperative societies failed to buy the produce in 1979. Cotton production resumed in 1997 when the Kyoga Cotton Company started mobilising farmers to grow cotton. The Cotton Development Organisation is also carrying out campaigns to grow more cotton to meet AGOA demands.

The villagers increased their cattle stock as they sold the bumper crops for good prices. However, when the neighbouring Karamajong started rustling their livestock, the villagers started living in camps for fear of the raiding Karamajong. Also, production of crops reduced drastically due to reduced acreage since their oxen, the power for land preparation, had been taken away. Table 8 shows the fluctuations of livestock ownership in Adodoi village.

Table 8: Livestock Ownership in Adodoi Village, Asamuk Sub-county

	Cattle		Goats	
	1940-1979	1980-1993	1940-1979	1980-1993
Poor households	3-5	Negligible	6	Negligible
Medium rich households	50	Negligible	18	Negligible
Rich households	> 200	Negligible	0ver 30	Negligible

After 1993, restocking of livestock started on an individual basis. A heifer cost UgSh130,000/= while a bullock cost UgShs150,000/=. The preference was for bullocks since restocking them would lead to larger acreage under crop production. Also, bartering took place with 10 goats in exchange for one heifer or 15 goats for a bullock. At times when there is famine in neighbouring Karamoja, 2 bags of sorghum grain are exchanged for 1 heifer. Unfortunately, the cattle rustling that took place from 1999 to 2000 reduced the livestock again. Presently, according to the PRA, only one third of households own one cow and two oxen on average.

Ogongora village is located 3km off the feeder road joining Orungo Sub-county Headquarters to Soroti in the western part of Katakwi District in Ogongora Parish of Orungo Sub County. The accessibility to the village is poor. The road to the village centre is a poorly maintained earth road with trouble spots. There are no motorised public passenger transport services except for hired motorcycle and bicycle *boda bodas.*

The population of Ogongora village is 726 inhabitants with 134 households. The average number of persons per household is 6. Usually, marriages are polygamous with two wives for each husband on the average. When the village was started in 1920s, the inhabitants were growing groundnuts, sweet potatoes, cowpeas, millet, sorghum, pigeon peas and cotton. Ploughing was used in preparation of land for cultivation of crops. In the 1930s, crop yields were good.

Cotton was sold to Asians who would collect the produce from the village by trucks to Acura and Atiriri Ginneries 15 km and 33 km respectively. Cooperative societies were set up in 1954. While Asians paid the farmers cash, the cooperatives issued chits for future cash payments and dividends if any accrued. Cotton buying stopped in 1985 leading farmers to abandon the crop. The cotton marketing system was liberalised and growing resumed in 1999 when the Government started a cotton development program in the north. During the period when cotton growing had stopped, farmers embarked on growing rice, soya beans and beans.

In terms of livestock, ownership among households varied each decade depending on disease and security situation in the district. For instance, in 1920s every household looked after cattle, goats, sheep and chicken. Rich households could have as many as 100 heads of cattle while medium rich and poor HHs could have 50 and 20 respectively. However, in the 1930s the numbers of heads of cattle dropped due to the rinderpest epidemic. In the 1940s, the numbers built up again and a household considered rich had 20 heads of cattle with numbers reaching 100 in the 50s and a peak of 150 in the 70s. In the 80s during the insurgency, cattle rustling by the Karamajong and rebellion by the Itesot, HHs lost all their livestock and there was a serious famine in the district. During this time pigs were introduced.

In the 80s people lived in and out of the villages, spending most of the time in camps. Restocking started in the 1990s whereby each bull cost UgShs200,000/= and a heifer UgShs250,000/= or in barter trade (17 goats for 1 heifer). Presently, rich households have 5 oxen and a heifer while medium rich ones have 2-3 oxen. Poor Hhs have zero cattle at the moment. As crop production, peaks up so does restocking of livestock since sells from the produce are used to buy the livestock.

Apule village lies on the northern shores of Bisina Lake. It is located in the southern part of Katakwi District in Kapujan Parish of Kapujan Sub County. It has good feeder road connections to Katakwi and Soroti. Furthermore, Lake Bisina provides access to Kumi District and to Soroti by boat. Unfortunately, the lake is 90% covered by waterweed making canoeing very drudgery.

The population of Apule village is 372 inhabitants with 84 households. The average number of persons per household is 6.

When Apule village was started in 1930s, the inhabitants were growing millet, Bambara nuts, simsim, groundnuts and cassava. Preparation of land was by hand hoe. Ploughing was introduced in 1940s. Crop yields were good. Cotton was grown for cash and sold at Ngora to Indians via Lake Bisina using large canoes.

In the early 1950s, a cotton ginnery was built 15 km from the village. Thereafter, cotton was sold to the ginnery directly. The cotton was transported to the ginnery by head loading or bicycle while in some cases lorries collected the cotton from the villages that were accessible by roads constructed during the Kakungulu administration. During that time, cotton prices were good and as such many farmers were encouraged to grow cotton in large farm sizes. With good earnings from cotton,

farmers were able to pay school fees, purchase livestock and pay for decent health services.

Following the expulsion of the Indians during the Amin Regime in the early 1970s, only cooperatives were buying cotton from the farmers on credit and this discouraged the farmers leading to abandoning growing the crop altogether. Thus, cotton was replaced by food crops such as sweet potatoes, cassava, groundnuts, millet and sorghum that were on demand in the urban areas.

During the insecurity / insurgency of the late 1970s and through the 1980s, it became impossible to produce and market any produce. People lived in camps. Crop production started in early 1990s albeit at low level because land preparation was by hoe as oxen were not yet restocked.

In the 1930s households used to keep cattle, goats and sheep. By the 1960s, livestock ownership among households was high with 500-600 heads of cattle for the richest household, 200 for medium rich and 20-30 for poor ones. During this period, the bride price was 20 heads of cattle while local brews were free for all. Also, household goods were plenty in supply and so were food crops. Livestock ownership started reducing in the 1970s because the people used to sell the livestock due to insecurity and reduced earnings from crops. Cattle ownership was 200, 50 and less than 10 heads of cattle for the rich, medium rich and poor households respectively.

Unfortunately, insurgency and cattle rustling by the Karamajong during the 1980s saw all households loosing their cattle. People started restocking livestock in 1992 starting with the oxen for ploughing. Two people would put together resources and buy a pair of oxen. Failing that, four people would try to pull a plough to prepare lands for crops. As the cash from crops increased, farmers bought more oxen and even added cows for breeding.

During the 1990s fish was abundant and became the main source of income. The fish was sold to Toroma, Katakwi, and Soroti. Traders would collect the fish from the villages along the lake. Now fish harvests have dwindled due to the waterweeds covering 90% of the waters. Fishing earnings of the villagers has drastically reduced. While there is a lot of fish in the lake waters, because of the weed it is difficult to catch the fish. Traders do not come to the village landing-site because the fish catches are too small to attract them. Daily earnings are only UgSh1,500/=. The village has appealed to the government to address the weed problem on the lake. Twenty fishermen have formed a group, which has opened an account at Uganda Commercial Bank/Stabic branch in Soroti. For future operations, the group is requesting the government to help them with a refrigerated truck for transporting fish for the three sub counties of Magoro, Toroma and Kapujan.

HOUSEHOLD SURVEY

The Sample

Table 9 presents the sample of the household survey used in the nine sub-counties of Iganga, Kasese, and Katakwi Districts. A total of 397 households were interviewed in 27 villages (i.e. about 15 per village). In each sub-county, one of the villages surveyed formed part of the locations where the PRA took place. In addition, two neighbouring villages were selected for data collection. Households were randomly selected in each village.

Table 9: The Household Survey Sample

District	Sub-Counties	HHs
Iganga	Ivukula	45
	Bukanaga	45
	Makutu	44
	Total	134
Kasese	Kyabarungira	43
	Mahango	45
	Nyakiyumbu	42
	Total	130
Katakwi	Asamuku	44
	Orungo	45
	Kapujan	44
	Total	133

In Iganga and Kasese District, the majority of respondents interviewed during the course of the questionnaire survey were mal, whereas about half the respondents were female in the case of Katakwi (Table 10).

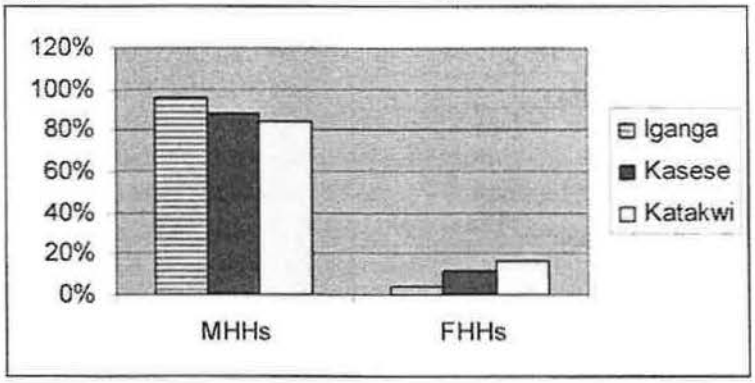
Table 10: Sex of Interviewees

District	Male	Female
Iganga	91%	9%
Kasese	82%	18%
Katakwi	51%	49%

Socio-Demographic Data

The vast majority of households are male headed. The fact that relatively more households in Kasese and Katakwi are headed by females (i.e. 12 – 16%) may reflect recent insurgencies in these Districts. In particular, Katakwi has a relatively high number of widowed household heads (19%), compared to 5% in Kasese and 2% in Iganga.

Figure 10: Household Heads by Gender



The mean **age of household heads** is of the order of 40 years (i.e. 38 – 42 years), with the exception of the limited number of female headed households in Iganga District (i.e. 5 out of 129) who have an average age of 46.

The mean **household size** obtained through the questionnaire survey (i.e. 9.5 in Iganga, 7.5 in Kasese, and 7.9 in Katakwi) was generally higher than the figures provided by the villagers during the PRA.

Table 11: Mean Household Size

District	Adults	Children	Male	Female	Total
Iganga	2.9	6.6	4.7	4.8	9.5
Kasese	3.5	4.0	3.8	3.7	7.5
Katakwi	4.1	3.7	4.0	3.8	7.9

Note: Figures may include rounding errors

HOUSEHOLD LIVELIHOODS

The following sections will provide information obtained from both the PRA and the household questionnaire survey on access to livelihoods, the vulnerability context, and livelihoods outcomes and strategies adopted by member of the communities surveyed. The policy and institutional context, which also forms a pillar of the livelihoods approach, is dealt with in other sections of the report (e.g. background information on GoU policies, and section on institutions and support services). Issues related to financial assets are covered in the section on wealth and poverty in farming communities, and also in the Section on institutions and support services (i.e. including micro-finance institutions) at the end of the report.

Access to Livelihoods Assets

Human and Social Capital Assets

Education is one of the key human capital assets. According to the survey, 71% to 87% of the children attend school, with the households in Katakwi showing the lowest percentage.

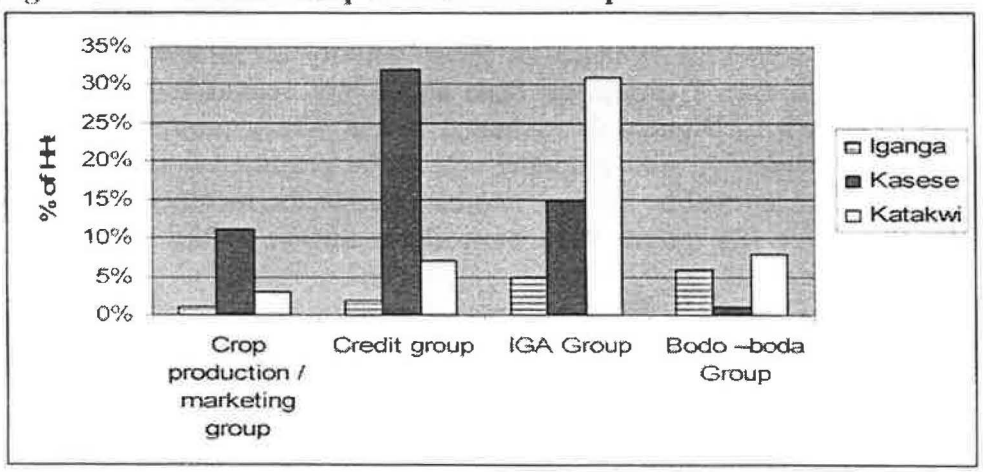
Table 12: Household Members Attending School (as % of children)

Iganga	82%
Kasese	87%
Katakwi	71%

NB: It is assumed that the majority of household members attending school are children.

Group membership is considered a main social capital asset in that it provides group members with easier access to other assets (e.g. micro-credit) or offers protection in times of hardship. Overall, the membership in groups is relatively low. Only membership in credit groups (32% in Kasese) and in IGA groups (31% in Katakwi, and 15% in Kasese) stand out.

Figure 11: Membership in Different Groups



NB: Question was posed as 'Are you, or is anyone in your family, a member of the following'. IGA stands for Income Generating Activity (e.g. brick-making).

Group-based Activity. The study attempted to identify social and economic groups as potential entry points for the discussion, testing of demand, and potential introduction of appropriate means of transportation. According to the PRA, the majority of farm and non-farm based economic activity is conducted on a household basis, aside from the cooperative system used in the marketing of cotton (Kasese District), informal IGA groups (e.g. brickmakers) and loose trader confederations.

Micro-finance cooperatives were found to exist in Nyamusule village of Mahango Sub-county (Kasese), started by the Catholic diocese. The cooperatives provide credit to those who save through the institution, though only to those who save a minimum of 50,000 shillings, with the loan provided as a multiple of the amount saved. The majority of loans were found to be taken for trading purposes, notably coffee and fish. Whilst the entry fee to a cooperative is low, a one-off payment of 1,000 Shillings, the minimum saving requirement to obtain a loan was found to be a barrier to access for the majority of residents. Aside from the micro-finance cooperatives, a number of women's groups had recently been initiated in the village, focusing primarily on support for women by other women ('empowerment').

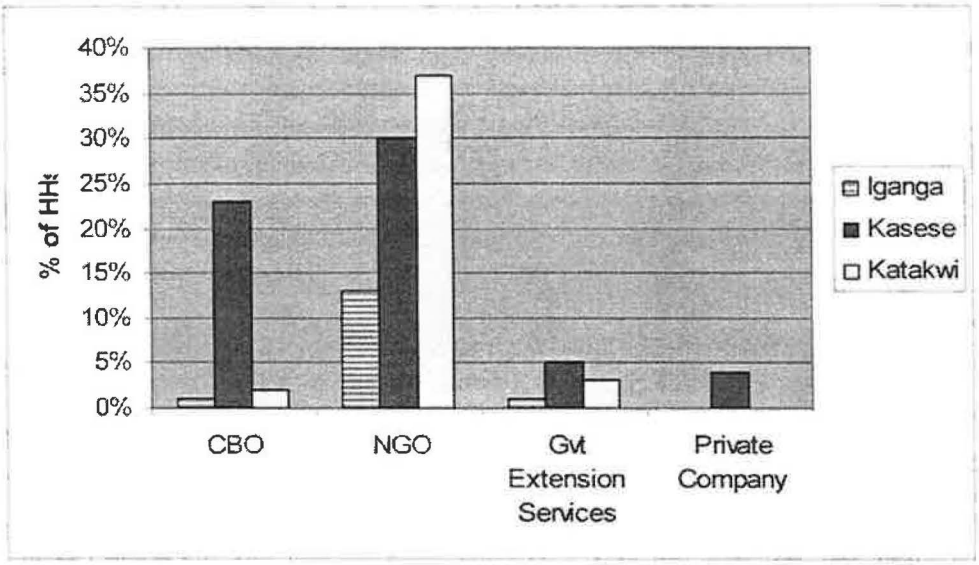
In Kitakurura village of Nyakiyumbu sub-county, a youth group established in 1996 has grown to include over 50 members (men and women) conducting cotton growing, selling and trading, brickmaking and tree-planting. Supported by the NGO CARE, the group was provided with training in financial management and environmental awareness (related to the tree-planting activity). Individuals save up 500 shillings per week in the group fund, and provide credit to members on a revolving basis. These loans have enabled three members to purchase bicycles, used by the individuals, but also lent to other group members. A 10 acre field was purchased by the group in which they have planted cotton, which is maintained and harvested alongside their own individuals plots. Money from the collective sale of this cotton is used to buy cotton from other members of the village, and trade it at the cotton unions. The group has saved USh200,000 to date, and expressed an interest in investing some of this money in transport for the group to support the cotton and brickmaking activities. Oxen and or bicycles were considered possibilities.

Maize, which is one of the main crops in Iganga District, is produced almost entirely on a household basis, with little evidence of group activity across the three study villages. In Kisega, a farmer's group had been active, but ceased in 1999 due to disagreements. Farmers in Bigunho participated in the IDEA project, providing inputs and loans for expanding their cropping area. The project encouraged group formation, but has been rejected by village members due to the inability to secure a high price for the maize (i.e. prices were particularly low in 2002), and thus an inability to pay back the loans.

The implication of the findings regarding group-based activity is that they are largely new structures, which operate outside of the realm of day-to-day productive activities. The majority of households conduct their farm and non-farm activities on an individual basis, and may engage in social and/or economic group-based activities on a periodic basis. On the other hand, group based agricultural and marketing activities have been identified by GoU as a vehicle to enhance agricultural commercialisation. This is reflected in efforts by GoU (e.g. NAADS in their trail blazing Districts) and NGO extension services to create new groups and strengthen existing ones.

Linkages with organisations such as CBOs, NGOs, Government extension services and private companies are also considered a social asset in the context of this study. Figure 12 indicates the percentage of people who have received support from these organisations in one form or another. According to the survey, NGOs form the main source of support (13% – 37%), followed by CBOs such as religious organisations (23% in the case of Kasese).

Figure 12: Linkages with Organisations



NB: Question was posed as 'Have you, or any member of your family, ever received support from the following'.

Ownership of Physical Assets

This section looks into the ownership of physical assets such as means of transportation, production equipment, and household goods such as radios or paraffin lamps.

Bicycles are the main Intermediate Means of Transport and one of the principal physical assets owned by the households surveyed (Table 13, Figure 13). In particular, Iganga has a very high ownership of bicycles (i.e. 84% in total, and even one hundred percent in Makutu sub-county. Katakawi District also has a reasonable degree of bicycles ownership (i.e. 36% in total, and 48% in Kapujan), whereas it is limited in Kasese District which is primarily due to the mountainous terrain. The number of bicycles owned by households is of the order of one, although average figures of 1.1 and 1.2 were reported in the sub-counties of Ivukula, Asamuku, and Kapujan.

No ownership of donkeys, donkey carts, tractors and trailers, cars and pick-up trucks was found. The ownership of bicycle-trailers and wheel-barrows is very limited.

The use of oxen and ox-carts was mainly found in Katakwi District, where Kapujan sub-county stands out (i.e. 16% of households own oxen and 14% own ox-carts). Draught animal power has been introduced in the Teso farming system relatively early (i.e. during the colonial period). Cattle raiding has been and still is a common problem encountered by livestock owners of the District.

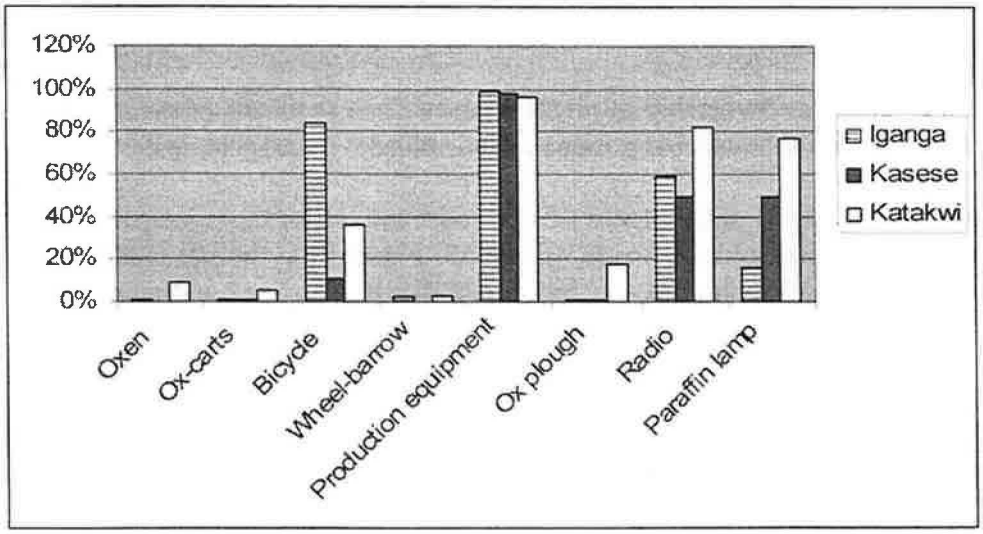
Almost all households own about three to five pieces of production implements such as hoes or cutlasses. The majority of assets were acquired either in the District capital or in local market towns.

Table 13: Ownership of Means of Transportation, Implements and Household Goods

	Iganga	Kasese	Katakwi
Donkeys	0%	0%	0%
Donkey carts	0%	0%	0%
Oxen	1%	0%	9%
Ox-carts	1%	1%	5%
Bicycle	84%	11%	36%
Bicycle- trailer	1%	0%	0%
Wheel-barrow	3%	0%	3%
Tractor and trailer	0%	0%	0%
Car	0%	0%	0%
Pick-up truck	0%	0%	0%
Production equipment	99%	98%	96%
Ox plough	1%	1%	18%
Radio	59%	49%	82%
Paraffin lamp	16%	49%	77%

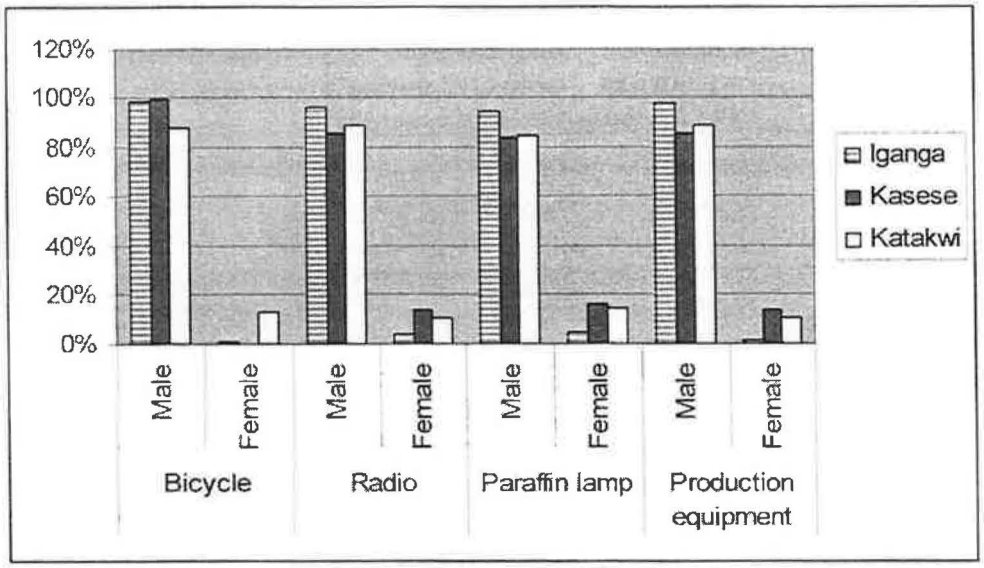
In most cases, the mean number of items owned by the households is of the order of one (1), with the exception of production implements (3.2 to 5.4), and oxen in the case of Katakwi (i.e. between 1.3 and 2.3 depending on the sub-county). These figures apply to those households which actually own the items under discussion.

Figure 13: % of Households Owning selected IMTs, and other Goods



In most cases these physical assets are owned by men (Figure 14). Ownership by women only appears to become comparatively more prevalent if there is a higher number of female headed households, suggesting that only household heads own assets.

Figure 14: Ownership of Bicycles and other Selected Goods by Gender



NB: Percentages refer to HHs that own at least one of the items.

Access to Land

Due to the context of the research (i.e. household needs to transport crops) it was deemed appropriate to use 'acreage cultivated during the last 12 months' as the main indicator for farm size and land ownership. In addition, information on the number of fields cultivated was sought.

The average acreage cultivated by households during the last 12 months before the survey (i.e. between November 2001 and October 2002) is of the order of 2.8 acres in the case of Kasese, 3.6 acres in the case of Iganga, and 4.0 acres in the case of Katakwi (Table 14). There are also variations within Districts regarding the amount of land cultivated by household. The following sub-counties show higher mean acreages: Makutu (Iganga), Kyabarungira (Kasese), and Kapujan (Katakwi).

The fact that the number of fields cultivated and the total acreage are very similar, suggests that the average size per plot is approximately one acre.

As far as differences between female and male headed households are concerned, only Iganga (i.e. small sample of FHH) shows a marked difference in that FHHs cultivated 2.0 acres as compared to 3.7 acres in the case of MHHs[18]. There is very little or no difference in this respect in Kasese and Katakwi Districts.

As for the link between land acreage cultivated and bicycle ownership (Figure 15), the majority of households (i.e. 57% and 54% respectively) owning a bicycle in Iganga and Katakwi Districts cultivate between 2 and 4 acres (Figure 15).

[18] FHH, Female Headed Households, MHH, Male Headed Households

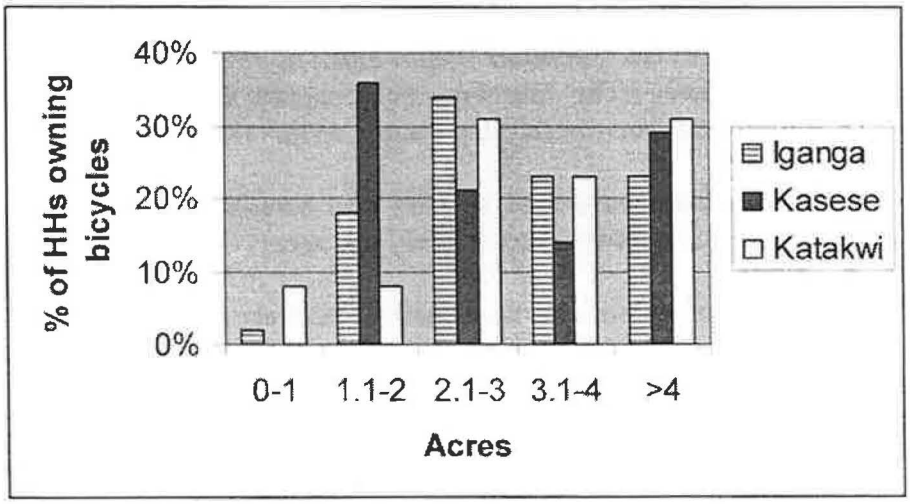
Table 14: Household Access to Land

District	Sub-Counties	Mean number of fields cultivated in last 12 months	Estimated mean total acreage cultivated during the last 12 months
Iganga	Ivukula	3.4	3.4
	Bukanaga	3.5	3.5
	Makutu	4.0	4.0
District Average		3.6	3.6
Kasese	Kyabarungira	2.7	3.6
	Mahango	2.4	2.5
	Nyakiyumbu	2.2	2.5
District Average		2.4	2.8
Katakwi	Asamuku	3.6	3.9
	Orungo	2.7	3.2
	Kapujan	5.0	4.9
District Average		3.8	4.0

In Kasese, 36% of the few bicycle owners that were encountered in that District (i.e. mostly in the flatter Nyakiyumbu Sub-county part of which is located in flat terrain) cultivate between 1 and 2 acres, and 29% more than 4 acres.

Overall, although very few households cultivating less than one acre own bicycles, bicycle ownership amongst the other groups is relatively evenly distributed.

Figure 15: Relationship between access to land and bicycle ownership



NB: Figures refer only to those households that own a bicycle, which is 84% (Iganga), 11% (Kasese), and 36% (Katakwi) respectively.

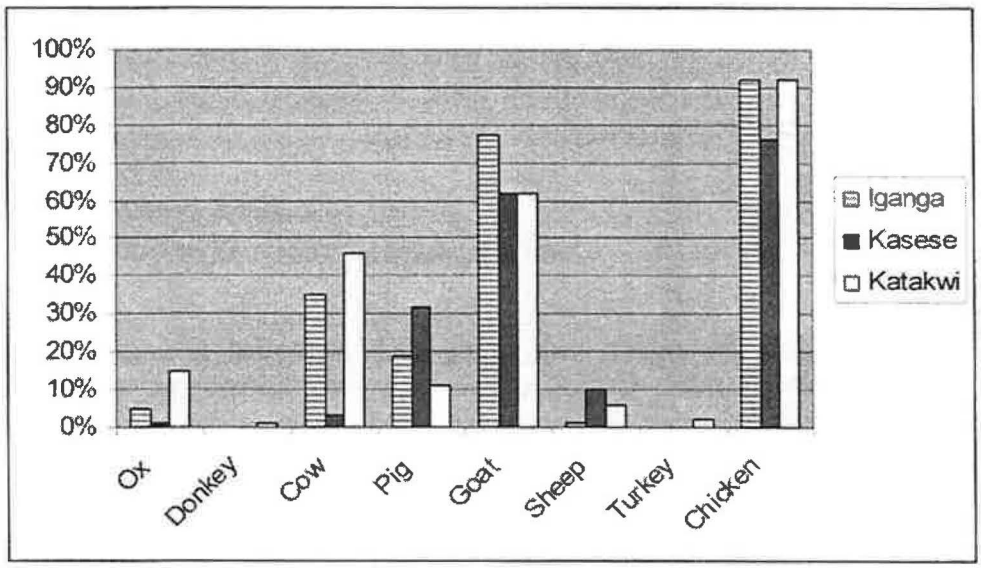
Table 15: Livestock Ownership

	Iganga	Kasese	Katakwi
Ox	5%	1%	15%
Donkey	0%	0%	1%
Cow	35%	3%	46%
Pig	19%	32%	11%
Goat	77%	62%	62%
Sheep	1%	10%	6%
Turkey	0%	0%	2%
Chicken	92%	76%	92%

NB: Percentage refers to households that own at least one

Poultry, goats, cows, and pigs are the main forms of livestock owned by the households. However, there are differences between the Districts, in that only a few farmers own cattle in Kasese.

Figure 16: Livestock ownership



NB: Percentage of households that own at least one

Vulnerability Context

The **vulnerability context** has to be seen in the context of shocks, trends, and seasonality encountered by households and communities. Insurgencies during the last decades have been one of the key factors causing household vulnerability, in particular in Kasese and Katakwi Districts. This may partly explain the higher number of female headed households in these two Districts (12% and 16% respectively) as compared to Iganga (4%). The percentage of widows is particularly high in Katakwi District (i.e. 19%). Aids is another factor leading to household insecurity in communities.

As already indicated, cattle rustling still prevails in Katakwi thereby causing a constant threat to livestock owners and their restocking efforts. This has also implications for the spread of IMTs such as oxen and ox-carts in this District. Cattle rustling has negatively affected agricultural production in the Teso farming system as a result of raided draught animals.

Weather related problems were reported by villagers in that flooding has caused damages in the communities of the Kasese mountains. For example, a number of villagers have drowned during the rainy season when they had to cross swollen rivers on their way to market centres. On the other hand, in Katakwi it was reported that delayed rains have affected crop production in the past.

Trends include declining soil fertility which is increasingly being recognised as a constraint to agricultural production in Uganda by Government, NGOs, and donors alike.

Declining farmgate prices for major cash crops such as coffee is another trend negatively affecting communities. Coffee, which is by far the major export crop of Uganda, has seen substantial price declines over recent years as a consequence of lower coffee prices on the world market. This has serious implications for communities heavily depending on one particular cash crop such as coffee.

Major inter-annual price fluctuations have affected marketing of food crops in recent years. For example, maize and dried cassava were at very low prices in 2001/02 as a result of a bumper harvest and lack of outlets. For obvious reasons, farmers were reluctant to produce the same amounts of produce in the following season.

Livelihoods Strategies and Outcomes

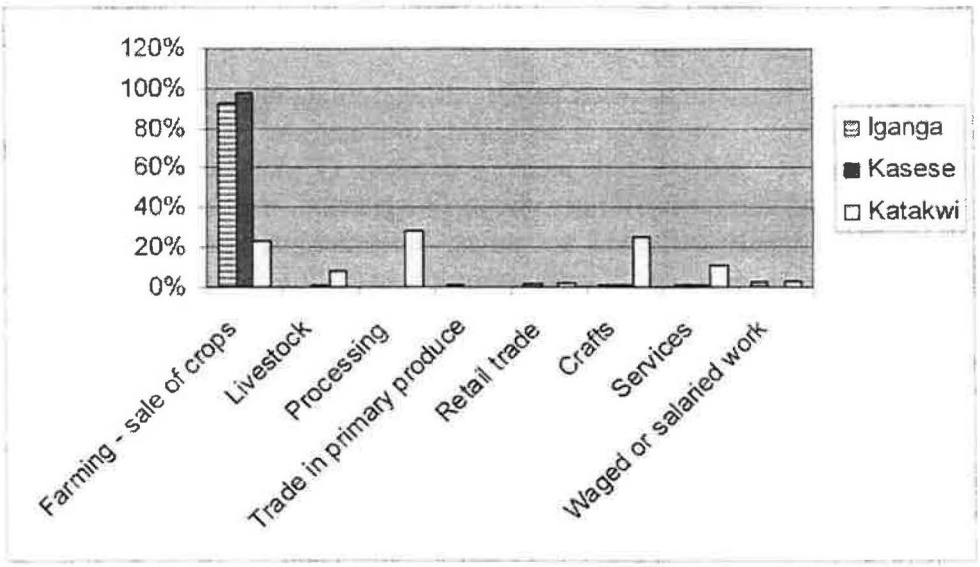
This section highlights key characteristics of occupations of the rural population, wealth and poverty from the villagers' perspective, and their expenditure patterns. Details of farming and crop marketing, and other Income Generating Activities (IGAs) will be presented in subsequent sections.

Occupations

Figure 17 indicates the main occupations and Income Generating Activities (IGAs) of household heads. Farming and the sale of crops clearly dominates the economic activities of villagers in Iganga and Kasese Districts (i.e. 93% and 98% respectively). Other activities only play a minor role in these two Districts.

In Katakwi, on the other hand, the household livelihoods in the three sub-counties surveyed are much more diversified in that farming, traditional processing of primary produce, and crafts each occupy about a quarter of the household heads' income portfolio. In addition, activities related to the sale of animal produce and services also play a role.

Figure 17: Primary Occupations / Income Generating Activities (IGA) of Household Head (by percentage of household heads)

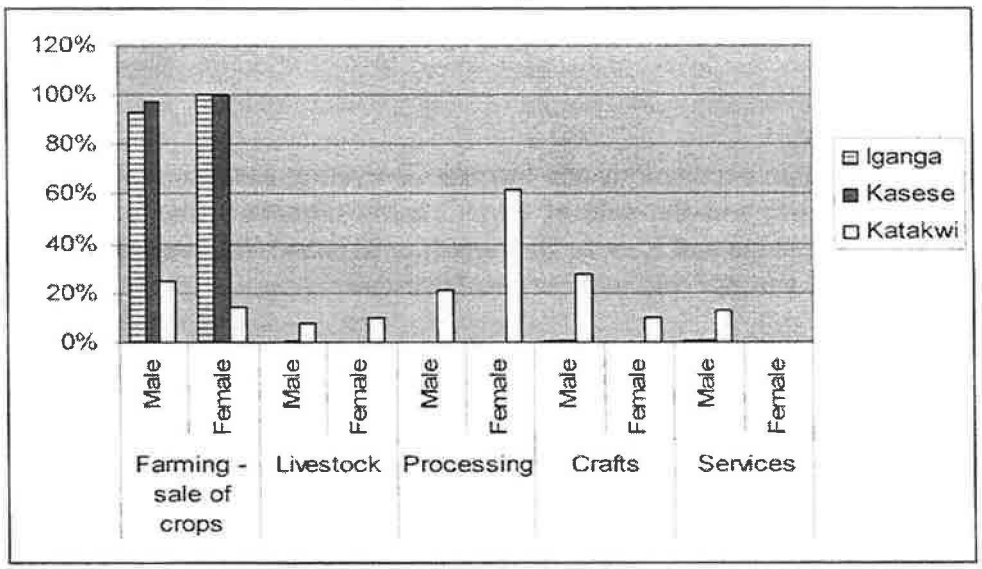


Key:
Traditional processing: charcoal, beer, etc
Retail trade: household goods, petrol, etc
Crafts: carpentry, brickmaking, pottery, handicrafts, etc
Services: mechanics, preparation and sale of cooked food, etc.
Waged or Salaried work: Government, NGO, etc

As far as IGAs by female headed households are concerned, farming and the sale of crops are their only primary occupation in Iganga and Kasese. In Katakwi, however, traditional processing of primary produce (i.e. 62%) plays a dominant role for FHHs. In particular, beer brewing is widely undertaken by FHHs in Katakwi. Other primary

IGAs carried out by FHHs in Katakwi include sale of livestock produce (10%), crafts (10%), and waged or salaried work (5%).

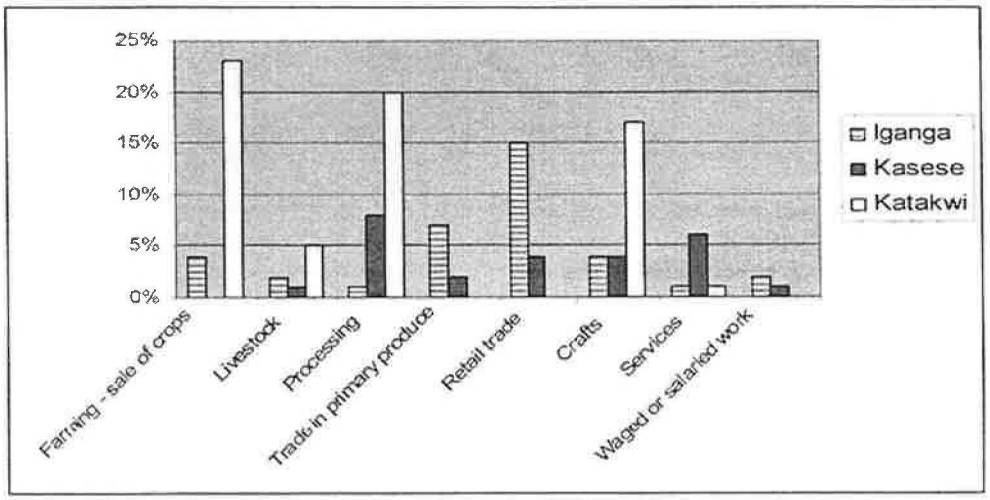
Figure 18: Selected Primary Occupations / IGA by Household Head, by Gender (by percentage of household heads)



NB: Percentages are related to the totals of male and female headed households. It is important to bear in mind that the majority of household heads are male. Female headed households (FHHs) represent 4% (Iganga), 12% (Kasese) and 16% (Katakwi), respectively.

Only about one third of household heads of the villages in Iganga and Kasese (i.e. 36% and 26% respectively) indicated a secondary occupation[19]. In Iganga, this includes retail trade (15%) and trade in primary produce (7%), whereas in Kasese only processing (8%) and services (6%) are above five percent. In comparison, 66% of Katakwi household heads indicated secondary occupations, mainly related to farming (23%), traditional processing of primary products (20%), and crafts (17%).

Figure 19: Secondary Occupations / Income Generating Activities (IGA) of Household Head (by percentage of household heads)

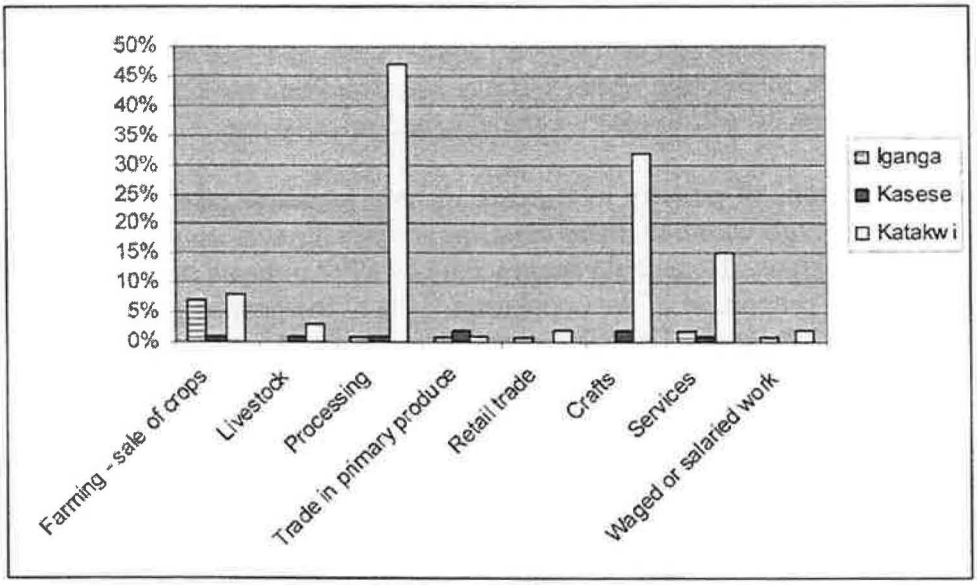


NB: Multiple answers were possible.

[19] Villagers could indicate more than one secondary occupation (i.e. other IGAs).

Figure 20 indicates income generating activities for other household members. However, in particular for Iganga and Kasese Districts, the figures obtained appear to be low and should therefore not be taken as absolutes. Once again, it transpires that villagers in Katakwi District have more diversified livelihood systems compared to Iganga and Kasese Districts.

Figure 20: Occupations / IGA of other Household Members (by percentage of household heads



NB. These figures appear low. When looking at a sample of questionnaires, it appears that this question has often not been answered. Thus, these figures should not be taken as absolutes.

Wealth and Poverty in Farming Villages

According to the PMA (GoU, 2000), "common features of a poor household include few assets for production; insufficient food; inadequate income to meet health care and education costs and to obtain basic household necessities; many dependants; poor health; or a lack of social support. This definition illustrates the complexity and multi-dimensional nature of poverty, emphasising that poverty is about more than income and expenditure data.

According to the Household Survey data (1997), 44% of Ugandans are unable to meet their basic needs and are living below the absolute poverty line, while 25% of the population cannot even meet their daily food requirements and live below the food poverty line. Although, in absolute terms, poverty has decreased by 21% since 1992, close to 9 million Ugandans still live below the absolute poverty line.

The principal dimensions of poverty in Uganda include location, gender, livelihood and seasonality. Although commonalities exist, poverty differs in its nature, extent, and trends between regions. Household Survey data of 1997 indicate that in the East, which has the greatest proportion of the population, 54% of the people live in absolute poverty, compared to 28% in the Central region. Whereas the North is the poorest in terms of development indicators[20], in terms of welfare indicators, the Western region fared worst[21], although this region has the second highest income levels[22]. Further, trends in absolute poverty indicate that in the East and the North, poverty has declined by only 8% and 13%, respectively, since 1992, compared to a decrease of 39% in the Central region. However, the majority of local people, perceive that in relative terms 'the rich are getting richer and the poor are getting poorer'[23].

Poverty is mainly a rural phenomenon as 48% of the rural population are below the absolute poverty line, compared with 16% of urban dwellers. Further, poverty has decreased by 43% in urban areas and only by 18% in rural areas in Uganda since 1992[24]. More than 85% of the population live in rural areas. The interventions under the PMA will bring about significant reductions in poverty".

Tables 16 to 18 below indicate how villagers in the survey areas categorise rich, middle-income and poor households according to their access to livelihoods assets such as land or livestock, type of abode, occupation, and levels of income.

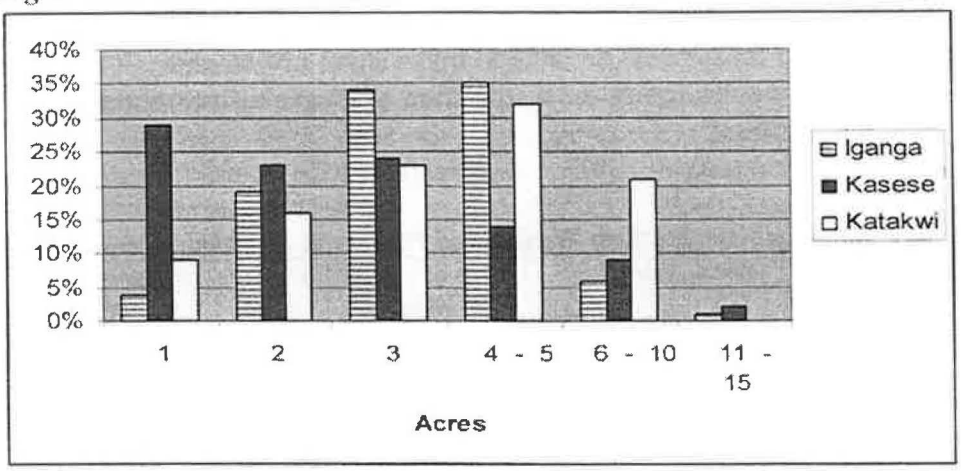
As for access to land, the richer households tend to own in excess of 10 acres up to 60 acres. Middle-income households would own 3 – 10 acres, whereas poor households would have access to two acres and less. In fact, according to the case studies, in seven out of nine cases it was reported that the poor would only own one acre or less.

Figure 21 indicates that in particular, in Kasese a substantial percentage of households cultivated two acres or less (i.e. 52%). Although Iganga and Katakwi also have households that cultivated two acres and less (23% and 25% respectively), the

[20] *Determinants of Regional Poverty*, 1999 (Okurut, Odwee and Adebua – EPRC).
[21] *Uganda National Household Survey 1997* and *Background to the Budget 1999-2000.*
[22] *Changes in Poverty and Inequalities in Uganda in 1992-97.*
[23] *Uganda Participatory Poverty Assessment*, 1999.
[24] *Changes in Poverty and Inequalities in Uganda in 1992-97.*

majority of households in these Districts own of the order of three to five acres (i.e. 69% and 55% respectively). Households that only cultivate one acre are particularly prevalent in Kasese District (i.e. 29%).

Figure 21: Land Distribution



NB: Acreage cultivated per Household during the last 12 months, % of HHs

As for livestock ownership (also see section on access to livelihoods assets), the only animals that are relatively prevalent in villages are chicken and goats, followed by cattle and pigs. At the same time, villagers that do not own chicken are of the order of 8% in Iganga, 24% in Kasese, and 8% in Katakwi. The majority of those households that have chicken, own a small flock of two to six animals. As for goats, 23% of the households in Iganga, 38% of the households in Kasese, and 38% of the households in Katakwi do not own this type of animal. The majority of those that own them have two to three animals, although in each District there are 26% to 28% of village households that only own one goat.

The vast majority of households in Kasese (i.e. 97%) do not own cows, whilst two thirds of Iganga households belong to this category and about half of the villagers in Katakwi. Most of the villagers that have cows own between one to three animals.

Unsurprisingly, there is a positive correlation between land area cultivated and ownership of oxen (i.e. Pearson correlation coefficient: 0.259). At the same time, this figure must be taken with caution given the very small sample of households that actually own oxen (i.e. 28 out of 397, 50% of which are located in Kapujan Sub-county of Katakwi District).

Based on the two indicators 'access to land' and 'livestock ownership', a substantial number of farmers would fall into the category of poor, according to the villagers' own classification. Access to these resources is particularly limited in Kasese District which is characterised by a high population density. Farmers in Iganga and Katakwi appear to have somewhat better access to these key livelihoods assets, although the vast majority of them are nevertheless also struggling to make ends meet.

As for income levels, from the case studies below it transpires that a person classified as rich at village level would have a monthly income of USh200,000 and above, whilst a middle-class household would have a disposable income of the order of USh100,000 to USh200,000 per month. In particular, richer households are often also engaged in income generating activities other than agriculture (e.g. trading, teacher). Poor households would have a monthly income of well below USh100,000 (i.e. often less than USh50,000). Regarding expenditures and savings, it is obvious that only middle income and richer households are able to make small investments. This needs to be borne in mind when considering the distribution of means of transportation (i.e. at a cost) to farmers for testing.

Table 16: Iganga District - Case Studies; Wealth and Poverty in Farming Communities

Sub-county	Village	Type of H/H	Field size in Acres	Animal/ Poultry Ownership	Type of Job/Occupation	Type of House	Approximate income per Month Ugsh	Approximate Expenditure per Month Ugsh
Bukanga	Bigunho	Rich	10	5 cows	Farmer/ Produce trader	Permanent	200,000	150,000
		Middle	7	5 goats 10 chicken	Farmer	Permanent	110,000	80,000
		Poor	1	5 chicken	Farmer	Temporary	10,000	6,000
Ivukula	Kisega	Rich	60	10 cows 4 goats 20 chicken	Farmer	Permanent	350,000	200,000
		Middle	12	2 cows 1 goat 5 chicken	Farmer	Permanent	130,000	120,000
		Poor	1.5	1 goat 5 chicken	Farmer	Temporary	25,000	25,000
Makuutu	Naitanda	Rich	14	1 cow	Farmer	Permanent	350,000	250,000
		Middle	5	-	Farmer	Permanent	170,000	150,000
		Poor	1/4	2 chicken	Farmer	Temporary	30,000	27,000

Source: PRA Exercise, November 2002.

Table 17: Kasese District - Case Studies; Wealth and Poverty in Farming Communities

Sub-county	Village	Type of H/H	Field size in Acres	Animal ownership	Type of Job/Occupation	Type of house	Approximate income per month/Ugsh	Approximate expenditure per Month/Ugsh
Kyabarungira	Kaswa ii	Rich	50	20 goats	Farmer/businessman	Permanent	500,000	385,000
		Middle	5	25 cows	Retail trader	Permanent	370,000	270,000
		Poor	1	-	Peasant farmer	Temporary	50,000	45,000
Mahango	Nyamusule	Rich	10	15 cows 100 hybrid chicken	Secondary School Teacher	Permanent	250,000	230,000
		Middle	8	9 cows	Businessman(coffee trader)	Permanent	200,000	180,000
		Poor	2	1 goat	Peasant farmer	Temporary	80,000	50,000
Nyakiyumbu	Katolhu	Rich	7	5 goats 1 cow	Famer/Retail trader	Permanent	300,000	270,000
		Middle	3	2 goats	Farmer	Permanent	180,000	150,000
		Poor	1	3 chicken	Peasant Farmer	Temporary	30,000	28,000

Table 18: Katakwi District-Case Studies; Wealth and Poverty in Farming Communities

Sub-county	Village	Type of H/H	Field size in Acres	Animal/ Poultry Ownership	Type of Job/ Occupation	Type of House	Approximate income per Month Ugsh	Approximate Expenditure per Month Ugsh
Kapujan	Apule	Rich	20	50 cows	Teacher	Permanent	250,000	230,000
		Middle	8	4 cows	Peasant farmer	Grass thatched	170,000	165,000
		Poor	Less than an Acre	-	Peasant Farmer	Grass Thatched (poorly maintained)	50,000	49,000
Asamuk	Ododoi	Rich	20	15 cows	Businessman	Semi-Permanent	200,000	190,000
		Middle	6	4 cows	Peasant farmer	Grass Thatched	150,000	140,000
		Poor	Less than an Acre	1 cow	Peasant Farmer	Grass thatched	65,000	65,000
Orungo	Ogongora	Rich	10	4 cows	Peasant farmer	Semi-permanent	160,000	150,000
		Middle	4	2 cows	Peasant Farmer	Grass Thatched	120,000	120,000
		Poor	1	-	Peasant farmer	Grass Thatched	40,000	30,000

Source: H Iga, PRA Exercise, November 2002.

Household Expenditures

Table 19 indicates the main items of expenditures incurred by the households over the last 6 months (i.e. prior to November 2002). Health related items dominate in all three Districts followed by school fees / equipment. The expenditure patterns in Kasese appear to be somewhat different in that purchase of clothes and production inputs is relatively more important here than in the other Districts.

It appears difficult to discern clear gender related expenditure patterns based on the distinction between female and male headed households (i.e. FHH and MHH respectively). Whereas education related expenditures are more important in FHHs in Kasese and Katakwi Districts, Iganga shows a different pattern. Health expenditures and purchase of clothes are of a similar order, in particular in Kasese and Katakwi, which have a relatively higher proportion of FHHs. Labour is the only item, which has been indicated by relatively more FHHs as a source of expenditure in all three Districts. It is assumed that this is due to their need to hire in labour for certain agricultural tasks.

A gender based analysis of expenditures needs to take into account that female headed households are likely to be poorer (e.g. many of them are widows) and as a result would have less financial resources available to spend on the items indicated. Also, any assessment of this comparative data needs to bear in mind that the question was not about the magnitude of the expenditure (i.e. it was only asked whether or not expenditures were occurred in relation to a specific item), and that the sample size of female headed households was small.

Table 19: Household item expenditures incurred over the last 6 months

	Iganga	Kasese	Katakwi
School fees / equipment (average)	52%	45%	68%
MHH	53%	41%	66%
FHH	40%	69%	76%
Hospital / clinic fees (average)	86%	79%	100%
MHH	87%	76%	100%
FHH	60%	94%	100%
2nd hand clothes (average)	35%	61%	33%
MHH	35%	61%	33%
FHH	40%	56%	33%
New clothes (average)	21%	42%	2%
MHH	22%	41%	3%
FHH	0%	44%	0%
Production inputs (average)	17%	54%	29%
MHH	18%	53%	29%
FHH	0%	63%	33%
Labour (average)	28%	13%	8%
MHH	26%	12%	7%
FHH	60%	19%	10%

NB: The sample size of the Female Headed Households (FHHs) is relatively small (i.e. 4% in Iganga District, 12% in Kasese District, and 16% in Katakwi District).

AGRICULTURAL PRODUCTION AND MARKETING

This section presents the key features of the farming systems in the three Districts where the survey took place. Before presenting details for each district a comparative picture of the main crops grown is provided in Table 20 and Figure 22, which are based on the results of the questionnaire survey. When reading the following sections, which are based on both PRA and questionnaire survey, it is important to bear in mind that inter-cropping is common place in all three Districts.

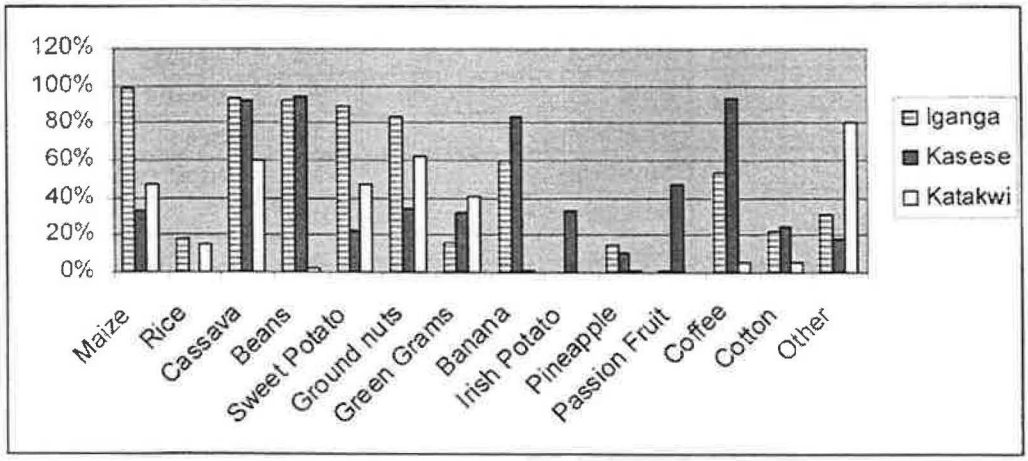
The figures show to what extent the farmers rely on a number of key crops such as maize, beans, cassava, sweet potato, groundnuts, banana and coffee in Iganga District. The main crops grown by Kasese farmers include cassava, beans, banana, coffee, passion fruit and Irish potato, and cotton. Katakwi farmers grow maize, cassava, sweet potato, groundnuts, millet and sorghum and oilseeds such as sunflower.

Table 20: Main Crops Planted (% of households)

	Iganga	Kasese	Katakwi
Maize	99%	33%	47%
Rice	18%	0%	15%
Cassava	93%	92%	60%
Beans	92%	94%	2%
Sweet Potato	89%	23%	47%
Ground nuts	84%	34%	62%
Green Grams	16%	32%	41%
Banana	60%	84%	1%
Irish Potato	0%	33%	0%
Pineapple	15%	11%	1%
Passion Fruit	1%	47%	0%
Coffee	54%	93%	5%
Cotton	23%	25%	5%
Other	31%	18%	80%

Source: Household questionnaire survey

Figure 22: Crops planted by Households, by District



NB: Other crops in Katakwi include oilseeds (e.g. simsim, and sunflower) and grains (e.g. millet and sorghum).

Iganga District

Crop production is central to the farming systems operated in Iganga District. According to the PRA, the most widely produced food crops in Iganga are beans and maize, followed by millet, cassava, groundnut, rice, sweet potato and vegetables including tomato and onion. Fruit is also produced across the district, notably banana and pineapple. Of the traditional cash crops, coffee and cotton are produced. It is interesting to note that during the course of the PRA, the importance of certain crops was highlighted to an extent which did not reflect the proportion of farmers that are actually growing them. For example, although described as quite important, rice is only grown by 18% of the households according to the survey. Cassava, on the other hand, was given less importance although it is grown by 93% of households.

With the demise of the government managed co-operative system dealing predominantly in traditional cash crops (e.g. coffee, cotton) and the unrelated decline in the world market price of these crops, the cropping patterns of rural households cannot so easily be sub-divided into 'food' and 'cash'. By-and-large, the majority of crops produced for food are also sold (See Table 21). This includes a number of 'non-traditional' crops, notably vegetables such as tomato and onion and beans such as soya.

As for the responsibility for crop growing, the household survey revealed that there is no clear cut division of labour according to gender. Nevertheless, women are comparatively more involved in food crop growing as compared to cash crop production which is more a domain of men, albeit not an exclusive one.

Table 21: Crop production across the Study Area in Iganga

Naitando (Makuutu S/C)		**Kisega (Ivukula S/C)**		**Bigunho (Bukanga S/C)**	
Crop[1]	**Sex**[2]	**Crop**	**Sex**	**Crop**	**Sex**
Consumption and Sale		*Consumption and Sale*		*Consumption and Sale*	
Beans	W	Beans	W	**Beans**	W
Maize	W	**Maize**	M	**Maize**	B
Millet	M	**Millet**	M	Bambara Nut	n/a
Cassava	M	Cassava	M	Sweet potato	n/a
Groundnut	B	**Groundnut**	W	Tomato	M
Rice	M	Bambara Nut	n/a	Cabbage	M
Sweet potato	M	Rice	M	Onion	n/a
Vegetables (other)	M	Vegetables	W	**Rice**	n/a
Pineapple	M	Soyabean	W	**Sugar cane**	M
Banana	W	Sesame	n/a		
		Banana	n/a		
Sale Only		*Sale Only*		Sale Only	
Coffee	**M**	**Cotton**	**M**	**Coffee**	M

[1] Key marketed crops are highlighted in bold.

[2] Indication of the gender of the family member who is responsible for the sale: W-Women; M-Male; B-Both; n/a – not available information.

Source: PRA, October 2002.

Responsibility for sale varies according to crop, and in some cases location. Whilst beans are sold only by women, millet, cassava and rice are sold only by men (Source: PRA). Maize is sold by a combination of men only, women only or both together depending on the region. The non-traditional or high value food crops and traditional cash crops are almost entirely sold by men; these include vegetables (tomato, cabbage), fruits (pineapple), coffee and cotton.

Of the variety of crops and fruits produced, maize, beans, and coffee provide a major source of income for the majority of rural households across the study area. In addition, rice and cotton, and to a lesser extent, groundnut, sugarcane and pineapple[25] were identified as income earners in one or more of the villages (highlighted in bold in Table 21). Consequently, the appraisal exercises conducted in each village involved profiling each as potential drivers of improved transportation.

Maize. Maize is a key staple crop of the majority of rural households in the district. Households plant on average 1-2 acres over two seasons; March/April (main season) and August/September (second season). Several varieties of maize are grown, including the local variety, *Musoga*, hybrids and *Longe*. By-and-large, farmers plant seed saved from their previous harvest. According to the PRA, average output from a one acre plot of maize over the past few years was cited as approximately 500kg from the first harvest, and 300kg from the second. Of this combined annual maize production, approximately 300kg is consumed, and 500kg is sold. Responsibility for production and sale of maize varied across the villages. According to the questionnaire survey, 95% of farmers in Iganga have sold maize during the 12-month period between November 2001 and October 2002, with an average quantity sold of approximately 900kg per household. This means that the average amount of land planted to maize would be close to 2 acres.

The majority of farmers sell at the farm gate to local agents after two weeks of storage at the home. Sale prices quoted fell within the range of USh30-50 per kg during the last season[26], to USh150-200 out of season. Thus, average household gross profits from maize sales per annum fall within the range of USh15,000 - USh25,000 where sales occur during the season (which was found in the majority of cases).

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[25] Due to the need to prioritise discussions during the assessments, less time was spent discussing pineapple, sugarcane and groundnut. Consequently, the information gathered on these three crops is presented in this footnote. **Pineapple:** Pineapple production is widespread in the south of Iganga district, although on a relatively small scale with the exception of a few large farmers. Harvested bi-annually (August-September and January-February), one acre (of high quality seed and organic fertiliser) can produce USh300,000-USh350,000 worth of fruit. Depending on the size and season, the farm gate price of pineapple falls within the range of USh200-300 each (this season). **Sugar cane.** Sugar cane is a relatively uncommon crop in the villages surveyed with few farmers producing. A number of farmers are working as outgrowers to a sugar factory (Kashira Sugar works- 4 of 10 farmers in Bigunho village are outgrowers), the remainder sell to nearby distillers. The crop is sold on an acreage basis- with wide variations in value on a year-by-year basis demand-dependent (this season- USh60,000-80,000 per acre, last season- USh400,000 per acre). In addition, there are a number of large sugar estates. **Groundnut.** Groundnut has only recently been introduced on a commercial basis.

[26] It is noted that maize prices were particularly low in the season referred to during the study, in comparison with previous years.

The buyers (agents) are typically a small number of village residents who move house-to-house until they gather sufficient bulk, typically 600-1000kg before selling on to traders either at local centres (thus transporting themselves using bicycles or renting a pick-up), or at the village (when traders come themselves using pick-ups). To some extent, this contradicts the questionnaire survey results which revealed that more maize is sold to non-local traders.

According to the PRA, the price of maize at local markets typically ranged between 1.5 and 3 times the farm gate price. Transport costs of USh1,500 per pick-up journey, and the market levies of 5 shillings per kg mean that agents make a net profit in the range of USh4,500 per load of 600kg (at a market price of 1.5 times farm gate) to USh31,500 per load of 600kg (at a market price of 3 times farm gate).

Maize is produced almost entirely on a household basis, with little evidence of group activity across the three study villages. In Kisega, a farmer's group had been active, but ceased in 1999 due to disagreements. Farmers in Bigunho participated in the IDEA project, which provided inputs and loans for expanding their cropping area. The project encouraged group formation, but has been rejected by village members due to the inability to secure a high price for the maize, and thus an inability to pay back the loans.

Labour for maize production centres around a bi-annual pattern of planting (two months, twice per annum), weeding (more intensive, lagged behind the planting periods), and harvesting (intensive one-week periods). The majority of maize fields are located near the homesteads, 10-15 minutes on foot. Walking is the primary mode of transportation to and from the field, although during harvest a minority of households pay bicycle owners to transport the produce to their homes.

Several factors were cited as barriers to improving the returns from maize production. Low production levels (due to pests, diseases and poor quality seed) and immediate cash needs were reasons given for not storing the crop for a longer period and gaining a better price. Lack of knowledge on market prices, being cheated on quantity and value (both at the farm gate and in trading centres), lack of sufficient production levels, poor (or expensive) transportation and market levies were reasons given for not transporting produce to the local markets. However, in spite of the lack of sustainable collective production and/or marketing for maize, the concept of working in groups was not entirely dismissed. It was commonly felt that some form of co-operative system, assuming a reasonable return on production, would be a partial solution to the low returns currently experienced.

Millet. Millet is produced mainly for consumption purposes, and was evident in two of the three study villages. Both men and women are responsible for its production, with acreage planted ranging between 0.5 and 2.5 acres per household. Production levels varied considerably, both depending on cropping area and productivity- ranging between 50kg per household per season for those planting 0.5 hectares or less, to 750kg per acre for those planting more, and with higher levels of productivity.

Millet is produced and sold on a household-basis from the farm gate. The average farm gate price of millet during the last season ranged between USh100-260 per kg, in

comparison with USh350 per kg in the local market (Naitandu village and Iganga Town respectively). As with maize, although less extensively due in-part to its higher consumption usage, male village agents purchase in bulk from the farm gate, taking the produce to market or selling on to visiting traders.

The crop's production is labour intensive, and the reduction in child labour available due to the government's education drive (universal primary education) alongside poor seed, rodents and declining soil fertility were stated as principal problems.

Rice. Rice is grown across the district, depending on accessibility to low-lying wetland areas. Production commonly revolves around a 16-18 month cycle, with the main planting season occurring during the period June-July, harvesting in October-November. The average planting area falls within the range of 0.5-1 acre, producing between 500-1,500 kgs per acre.

The location of the rice fields were commonly found to be some distance from the homesteads (from 1km upwards), and renting land for rice production was found to be quite common. In-kind payment for land rental was valued at 50kg of rice per 0.5 acre rented. Production, predominantly the responsibility of women and children, is labour intensive. Travel time to the fields is commonly higher than for other major crops, for the activities weeding, harvesting and bulk transportation back to the homestead. Women and children spend considerable time at the rice fields prior to harvest to guard the crop against decimation from birds. Harvesting typically occurs within a short, labour intensive period. Harvesting 1 acre may take 6 people 8 days, thus involves hiring labour both for harvesting (payment in-kind of 15-20kg per day) and for transportation (variable price depending on the destination and form of transportation).

The majority of households sell rice at the farm gate. In its raw (paddy) form, rice fetched on average USh250 per kg last season. Thus, gross profits ranged from USh125,000 Shillings (500kg) to USh375,000 shillings. Transportation costs of rice to the mills varies considerably depending on economies of scale and distance. Amongst the study villages, this ranged from USh1,500 per bag (100kg) using a bicycle to USh100 per bag using a pick-up. Milling costs approximately USh40 per kg (and reduces the bulk by half). The value of milled rice last season ranged between USh450 and 500 per kg. Thus, the margins made by agents or traders are relatively small (in the region of a few thousand shillings) where bulk purchase, and quality selection is not involved.

Coffee. Coffee is produced by over half of all households in the study villages located in the central and southern parts of the district. The most common variety grown is *Robusta*, with an average planting area of between 0.25-1.5 acres per household. No households were found to rent land for coffee production, due to the long lag period (3-5 years) until trees start to produce.

The majority of coffee fields are situated within 1 km of the homestead, with 5-10% of households found to have some plots further afield due to farm fragmentation caused by inter-generational movement and increasing land pressure. Transportation to and from the coffee fields is largely on foot, although harvested coffee is

transported by bicycle by those that own or pay (at an in-kind cost of 5-10% of production).

Coffee has two harvests per annum, the first and main harvest between September and December, the second and smaller harvest between April and June. The current stand of trees discussed in one village (Naitandu) was found to be three years old, with the productivity normally lasting five years. However, problems have been experienced with coffee wilt disease, with an associated decline in productivity, so it was felt that the crop may have to be uprooted and re-planted sooner. Average yield per acre was found to be in the range of 600-800kg of fresh coffee. Thus, household coffee production falls within the range of 200-1000kg per annum. Production and sale is entirely the responsibility of men, with the exception of widows. All production is carried out at a household level, with the produce stored inside the home.

The majority of households dry the coffee at the homestead, and store for a maximum of one week prior to sale. Due to the length and variability of the coffee harvest, it is commonly harvested and sold in small quantities according to availability and cash requirements. Thus, it is most commonly sold to non-local traders and village agents from the farm gate. 'Emergency' sales of fresh coffee, when a household is in urgent need of cash, were conducted last season at an average price of USh30-50 per kg. Dried coffee sales last season fetched an average farm gate price of USh80-150 per kg. During a particularly good harvest, farmers will use or hire a bicycle to take their coffee to market where it can be crushed and sold at 3 or 4 times the price. Taking into account transportation costs, crushing costs (and the associated reduction in weight by a factor of 2), the sale of coffee in a local market may increase the net value by as much as 100% (on a 500 kg load).

Despite the known (or perceived) benefits of sale at the market place, on top of a strong feeling that agents and traders are cheating farmers at the gate (both in terms of quantities and quality- thus price), the lack of organisation (post-co-operatives) and the need for regular income (and thus regular but small harvests) presents a constraint to group organised production and/or transportation and market sale.

Cotton. Cotton production, centred in the north of the district, has fluctuated considerably over the past 50 years due to internal socio-political changes and international price variations[27]. Whilst many households grow cotton, the scale of production varies considerably. The majority of households plant and harvest on average 0.5 acres, whilst a few plant 5 or more acres. Planting occurs during July and August, harvesting during December and January. The output from 0.5 acre plot was

[27] A history of cotton in Ivukula sub-county. Before the 1950s, Asians purchased cotton for wholesale. In 1955, a co-operative union was set up displacing the Asian cotton buyers, taking the produce to the sub-county ginnery. Lack of payment to farmers for cotton during the 1970s by the co-operative societies forced farmers to produce less, which by 1980 took cotton farming to a virtual standstill. In 1983, the co-operatives reorganised and began paying cash for the cotton, albeit at a fixed price. This led to a resurgence in production until 1990, when the market was liberalised. The vacuum created by the dissolution of the co-operatives was filled by independent traders, and widely variable prices. Farmers responded to this change in different ways, some ending cotton production, others increasing. However, in most cases, sale is now conducted on an individual basis with traders.

estimated to be 120kg (for comparative purposes- approximately 240kg per acre). Planting, harvesting and sale is conducted on a household basis, with no evidence of groups forming to replace the old co-operative system (see history of cotton in Ivukula footnote). The majority of households sell from the farm gate, at a price of USh200-250 per kg (last season) to agents or traders who transport the crop by bicycle or pick-up to ginneries located in nearby trading centres (Busembatia for those in Ivukula sub-county) or the district centre (Iganga).

A number of wealthier farmers rent land for cotton production at a cost of USh10,000 per 0.5 acre. These farmers utilise purchased seeds and fertiliser, with which their productivity per acre falls within the range of 300-500kg.

Overview of Marketing System in Iganga District – Household Survey Results

Table 22 highlights the extent to which food crops such as maize and beans are sold by Iganga farmers. At the same time, cassava and sweet potato which are widely produced are only sold by a small proportion of farmers in the District, reflecting the fact that roots and tubers are not a lucrative option for producers compared to higher value food and cash crops.

As for the quantities involved, the figures show that farming in Iganga District is relatively more commercialised than in the other two Districts. A key factor in this context is its proximity to major markets and centres of consumption such as Kampala and Kenya.

The crops are predominantly stored at home. Village stores were not used in the sub-counties were the survey took place. However, it is understood that in other sub-counties NGOs such as NALG are encouraging farmer group formation and storage in village stores. This is required for selling larger quantities of bulked up crops to wholesale buyers (e.g. World Food Programme).

Most of the farmers in Iganga District surveyed tend to sell their crops at the farmgate (e.g. 87% of maize sales, 85% of beans, 85% of coffee). At the same time, the majority of them sell these crops to non-local traders (e.g. 57% of maize sellers, 62% of beans, and 58% of coffee). Village agents are the second most important category of buyers (e.g. 34% of maize, 26% of beans, 36% of bananas, and 30% of coffee). Selling at the District market or the village store is relatively uncommon.

The main reasons stated for selling the crops to these buyers include "believe this buyer offers a better price, 68%", "always sell to this person, 23%%", "due to lack of own transportation, 37%", and "only known buyer, 17%). Respondents could give up to two answers to this question.

According to village members in the three sub-counties, the average distances to the main markets are of the order of 10 kms (Ivukula), 12 kms (Bukanaga), and 10 kms (Makutu) respectively.

For details of Uganda's agricultural marketing system from a national and international perspective see Natural Resources Institute and Foodnet (2002).

Table 22: Crops Marketed in Iganga and Quantities Sold

	Crops marketed (% of households)	Quantities sold (mean kg per household)
Maize	95%	901
Rice	7%	390
Cassava	9%	318
Beans	46%	278
Sweet Potato	4%	250
Ground nuts	18%	152
Green Grams	9%	531
Banana	10%	356
Irish Potato	0%	-
Pineapple	10%	1240
Passion Fruit	1%	400
Coffee	46%	644
Cotton	24%	490
Other	22%	614

Table 23: Storage Location – Iganga (% of households)

	In Home	Village Store	Private Company	Elsewhere
Maize	100%	0%	0%	0%
Rice	96%	0%	0%	4%
Cassava	50%	0%	0%	50%
Beans	98%	0%	0%	3%
Sweet Potato	26%	0%	0%	74%
Ground nuts	99%	0%	0%	1%
Green Grams	77%	0%	0%	23%
Banana	50%	0%	0%	50%
Irish Potato	-	-	-	-
Pineapple	70%	0%	0%	30%
Passion Fruit	100%	0%	0%	0%
Coffee	100%	0%	0%	0%
Cotton	100%	0%	0%	0%
Other	88%	0%	0%	12%

Table 24: Location of Sale – Iganga

	From Home	Village Market	District Market	Village Store	Else-where
Maize	87%	4%	6%	0%	3%
Rice	80%	10%	0%	0%	10%
Cassava	85%	15%	0%	0%	0%
Beans	85%	2%	10%	0%	3%
Sweet Potato	100%	0%	0%	0%	0%
Ground nuts	96%	4%	0%	0%	0%
Green Grams	58%	17%	17%	0%	8%
Banana	69%	15%	15%	0%	0%
Irish Potato	-	-	-	-	-
Pineapple	93%	0%	0%	0%	7%
Passion Fruit	100%	0%	0%	0%	0%
Coffee	85%	3%	8%	0%	3%
Cotton	87%	10%	0%	0%	3%
Other	77%	10%	0%	0%	13%

NB: Percentages and quantities refer to those households that have sold some of the crops.

Kasese District

Crop production is central to the farming systems operated in Kasese District. Average household cultivated land area falls within the range of 2.5-3.5 acres across the study area. The most widely produced food crops in Kasese are beans and cassava, followed by maize, irish potato, groundnut and some vegetables (e.g. tomato and spring onion). Fruit is also grown in parts of the district, notably banana and passion fruit. Of the traditional cash crops, coffee and cotton are produced.

With the demise of the government managed co-operative system dealing predominantly in traditional cash crops (e.g. coffee, cotton) and the unrelated decline in the world market price of these crops, the cropping patterns of rural households cannot so easily be sub-divided into 'food' and 'cash'. By-and-large, the majority of crops produced for food are also sold (See Table 25). This includes a number of 'non-traditional' varieties, notably vegetables such as tomato and onion and beans such as soya.

Table 25: Crop production across the Study Area in Kasese

Kaswa II		**Nyamusule**		**Kitakurura**	
Crop[1]	**Sex**[2]	**Crop**	**Sex**	**Crop**	**Sex**
Consumption and Sale		***Consumption and Sale***		**Consumption and Sale**	
Beans	M	Beans	M	**Groundnuts**	n/a
Millet	n/a	Cassava	n/a	Onion	n/a
Cassava	n/a	**Irish Potato**	W	Sweet potato	n/a
Irish Potato	W	Banana	B	Tomato	n/a
Cabbage	W	**Passion Fruit**	M	**Soya Bean**	n/a
Tomato	B	Vegetables (unlisted)	n/a	Maize (little)	n/a
Maize	n/a			Pineapple	n/a
Wheat	n/a			Passion Fruit	n/a
Garlic	M				
Spring Onion	n/a				
Banana	B				
Passion Fruit	W				
Sale Only		*Sale Only*		Sale Only	
Coffee	M	**Coffee**	M	**Cotton**	M
Sugar Cane	B	Cotton (little)	M	Coffee	M
		Sugar Cane	n/a		

[1] Key marketed crops are highlighted in bold.

[2] Indication of the gender of the family member who is primarily responsible for the sale: W-Women; M-Male; B-Both; n/a – not available information (NB. The question of who is responsible for sale was introduced later in the study, so was not specifically asked in the case of Kitakurura village). Source: PRA, September 2002

Responsibility for sale varies according to crop, and in some cases region. The traditional cash crops, coffee and cotton, are primarily sold by men, whilst some of the food crops that are sold as well as consumed are sold by women, notably Irish

potato. Passion fruit is sold by men in some areas, and women in others. Despite the variation in responsibility, the majority of higher value crops are sold by men.

Of the variety of crops and fruits produced, coffee, passion fruit, cotton and Irish potato provide a major source of income for the majority of rural households across the study area. In addition, sugar cane, and to a lesser extent, bean, groundnut, tomato, garlic, soya bean and spring union were identified as income earners in one or more of the villages (highlighted in bold in Table 25). Consequently, the appraisal exercises conducted in each village involved profiling each as potential drivers of improved transportation.

Coffee. Coffee is the main cash crop grown in Kasese District, with households cultivating plots of between 0.5 and 1 acre. Harvesting takes places twice per year – the high season falling between August and November, reaping between 100-600kg per acre, and the low season between March and May, which yields between 50-400kg. Thus, total production per annum on average falls between a low of 75kg for 0.5 acre plot to 1000kg for a well managed 1 acre plot[28]. Current production is depressed, blamed by farmers on the current coffee variety used which they feel does not produce high yields.

Coffee is sold fresh, dried and crushed depending on cash needs and availability of buyers. Weight is reduced by half when dried, a process that typically takes about one month at the homestead . Crushing (or dehulling) is practiced by relatively few households, with most buyers preferring to take raw coffee to coffee mills. The majority of households sell their coffee immediately after picking or drying, with few farmers found to store the coffee for up to three months when a better price can be obtained.

2002's average farm-gate price for unprocessed coffee in the district was cited as USh200-250 Shillings per kg. Crushed, or processed coffee (for which the bulk is reduced by a further two-thirds) was cited at USh400-450 per kg at the farm-gate, in comparison with USh500 - 600 in the urban market. Prices were cited by farmers as declining consistently and rapidly over the past few years, with prices per kg over the past three years stated to be USh800S per kg in 2001, USh1500 per kg in 2000 and USh2500 per kg in 1999 at the urban markets.

Whilst men were found to be primarily responsible for coffee sales, some women were found to be also active in this area. However, without exception, men were found to control the income generated from the sales, even if women were responsible for the transaction.

Land was identified as the major constraint to improving returns from coffee growing. Many farmers were found to rent land for coffee growing, in some cases a considerable distance away from the homestead (1-1.5 hours walk in the case of two men interviewed), as well as growing it on their own land. Aside from increasing the area planted with coffee, the lack of hoes and access to machinery for crushing the

[28] The width of the range of levels of production reflects the differing findings from each study village in the district. This variation may reflect different levels of accuracy, but could also be explained by differing crop management practices, intercropping with other food and cash crops, and/or the fact that some of the coffee plants are quite old.

coffee (the majority currently crush by hand), and the replacement of old trees with new ones were considered means of improving the returns from coffee.

Passion Fruit. Passion Fruit was found to be an important cash crop in two of three study villages, Nyamusule and Kaswa II. On average, 0.5-1 acre plots are cultivated, producing between 600-1,600kg during the peak harvest season (January-March) and between 300-800kg during the second season (October-December). The fields in which passion fruit is grown vary in distance from the homestead up to 1.5 km away. The crop is grown both per household and in groups.

Discussions with one group growing passion fruit in Nyamusule Village revealed that the group of five members commonly own a nursery bed, hiring labour for weeding, but planting and harvesting the crop themselves. They divide up the crop, and market individually from the homestead or carrying their portion into market.

There is no fixed market for passion fruit, with variable demand and thus price. During the seasons, if the fruit is abundant, the average farm gate price was estimated to be approximately USh400 Shillings, rising to USh900 when the fruit is scarce. Off-season prices were found to rise as high as USh1000 per kg. The average on-season price during the January-March period 2002 in the study villages was cited as USh550 per kg.

As well as selling at the farmgate, a number of farmers were found to transport the passion fruit to Kilembe and Kasese markets on foot (back-loading). From Nyamusule village, the trip to Kilembe takes 3-4 hours loaded, approximately 15km in distance. The market price was found to be an extra 50-100 shillings per kg, depending on the season. The majority of those transporting the passion fruit were found to be women, either the farmers themselves, or 'porters', hired to transport the produce to market.

The difficulties experienced with the production and sale of passion fruit relate both to the existence of crop disease which is currently affecting production levels, and the lack of efficient transportation. In discussion, it was not felt that hiring motorised transport would be efficient due to relative inaccessibility of the villages, although this was seen to be a moot point[29]. Donkeys were suggested, although it was recognised that experience with the animal is limited. In terms of opportunities, it was noted that there was a plan to construct a processing-juice plant in 1996 near the village, but due to instability this did not occur. A number of village members stated that they felt this would increase the value of the crop considerably.

Cotton. Grown on the flat, lower lying terrain of the rift valley, cotton was found to be the major cash crop in one of the three study villages, Kitakurura (Nyakiyumbu sub-county), and to a much lesser extent in parts of Nyamusule (Mahango sub-

[29] In fact, at 50,000 Shillings from Nyamusule to Kilembe for a pick-up which could carry 20-25 sacks @ 50-55kg per sack and with a market price of 50-100S per kg over the farmstead price, profit would range between 4,000S (sale of 20 sacks at 50S per kg over farmstead price) to 85,000S (sale of 25 sacks at 100S per kg over the farmstead price). When pointing this out in rough terms, the conversation centred on the difficulty of organising collective sale.

county). Cotton was introduced around 1940, and grew to become one of the major cash crops of the district. Households cultivate on average between 1-2 acres of the crop, rising to 5 acres amongst the wealthier. Due to the terrain in Nyakiyumbu sub-county, households are located in two main settlements, a permanent settlement in the mountains (Kitakurura) and a temporary settlement on the plains near to the cotton fields. During the cotton seasons, the majority of families move to the temporary settlement to plant and then harvest the crop, whilst the children remain in the mountains to attend school. Some own houses in the temporary area, whilst others rent (at a cost of USh5,000 shillings per month for a home with a metal roof, USh3,000 for one with a grass roof).

The main cotton planting season falls between August and September, with weeding carried out four times per year. During the growing season, the crops are sprayed every two weeks with chemicals, and harvested between January and April (March being the peak month). Each field of cotton is harvested in one go, with farmers employing up to 20 people per acre to achieve this. Harvesting and the transportation to home or a store is required to occur within a day to avoid theft from the field.

Approximately 30% of farmers were found to hire tractors to prepare the land, at a cost of USh30,000 per acre, whilst the majority is ploughed by hand. 30% of the hand ploughing is hired labour, whilst the majority is done by the farmers themselves in groups, on rotation from one plot to the next.

The average yield cited in Nyakiyumbu sub-county fell within the range of 400-1,200kg per acre depending on the year. The price per kg were cited as ranging from USh150 per kg early in the season to USh200 per kg towards the end of the season at the depots in the temporary settlement. Estimates of the gross revenue from cotton production are averaged at USh150,000 per acre (ranging from USh80,000 to USh240,000 per acre), with expenditures ranging between USh50,000-70,000 per acre, excluding family labour. Thus, net revenue generated per annum is between USh30,000 and USh170,000 per acre, making cotton the greatest source of cash income for farm households in this sub-county.

The marketing is primarily done through cooperative societies. Five exist in Nyakiyumbu sub-county[30], whose function is to organise marketing (and to some extent, production) for members. Each cooperative has an average of 200 members, and are the favoured method of sale as they operate a bonus scheme for farmers at the end of each season (although was only 20 cents per kg last season). The farmers elect the chairmen of the cooperatives, who in turn elect the chairman of a union (who tends not to be a farmer). The principle buyers for cotton are a union (Nyakatonzi[31]) and a private operator (Amedan). Five storage points have been established by the unions in different villages.

[30] Bwera Katogo Growers Cooperative Society; Karambi; Nyamambuka; Katoma; and Nyakaihya

[31] A visit was made to Nyakatonzi Cooperative Union by the study team. A union representative explained that the cotton sector in the district is organised into cotton cooperative societies (CCSs) which act as buying/ collection centres. 30 CCSs form part of this union, each having 200-250 members. The total acreage under cotton in the district was estimated to be 24,000 acres, with the average farm size ranging from 1-2 acres, and an average yield of 600kg per acre. The Union has received support from the USAID-SPEED project.

Sales through the cooperative system to the stores remains the main mode of marketing in the absence of self-organised stores and marketing arrangements. The lack of trust of unions in providing better prices is offset by the lack of trust between farmers in organising a collective store or collective sale.

Other problems identified in cotton relate to a lack of transportation, particularly bicycles in moving between the permanent village and the temporary settlement / fields, and in the transportation of cotton to buyers as an alternative to the existing marketing method. The transportation of cotton from the field to the stores is predominantly carried out by women, loading the cotton on their heads, a small proportion is carried by men, and to a lesser extent, by bicycle. During the growing season, the majority of farmers reside back in the village, and not at the temporary settlement. For weeding and other tending, trips from Kitakurura to the fields take 4 hours each way by foot, and approximately 2 hours by bicycle (3 hours back). No experience of oxen or donkeys was found, although hearsay about 'wild donkeys' in neighbouring villages presented a less than positive image of using the animal for carrying loads.

Irish Potato. Irish potato, cultivated in two of the three study villages, represents an important source of household sustenance and income, controlled largely by women. The potato has two harvest periods; the primary season running from August to December, and the second lower season between March and June. The majority of women were found to transport the potato to the urban markets in Kilembe (from Nyamusule) and Kasese, three days per week during the harvest seasons. Production levels were not identified, but the market price during the main 2002 season was cited to be in the range of USh2,000-3,000 per basket of potatoes. The farm gate price was identified as USh1,500-2,000 for the same period.

Other Crops. Other crops grown across the study area include traditional food crops, such as beans, and newer cash crops such as garlic and soya bean. Households farm an average of 2 acres of beans in two of the three villages studied, producing 100-150 kg of which one third is used for consumption, and two thirds sold at the market[32]. Transporting the produce to market, as with the majority of other crops, is accomplished on foot, either by the farmers themselves, or by hiring labour – typically women. Garlic was found to be grown by about a quarter of households in one of the villages (Kaswa II), planting on average 0.25 of an acre. All of the garlic is sold in the local markets as a relatively high value crop (market price ranges between USh800-3000 per tin).

Constraints to farming

A brainstorming and ranking exercise was conducted with key informants in each of the study villages to identify the key constraints to farming. As Figure 23 illustrates, lack of appropriate transportation was ranked the most important constraint to farming as an average across the three villages (ranked the most important in Kaswa II and

[32] As already indicated above, intercropping is widely practiced. As a result, this needs to be taken into account when reading the crop yields.

Nyamusule, and second in Kitakurura), this was closely followed by the lack of markets for, or the low returns from marketing crops).

Figure 23:

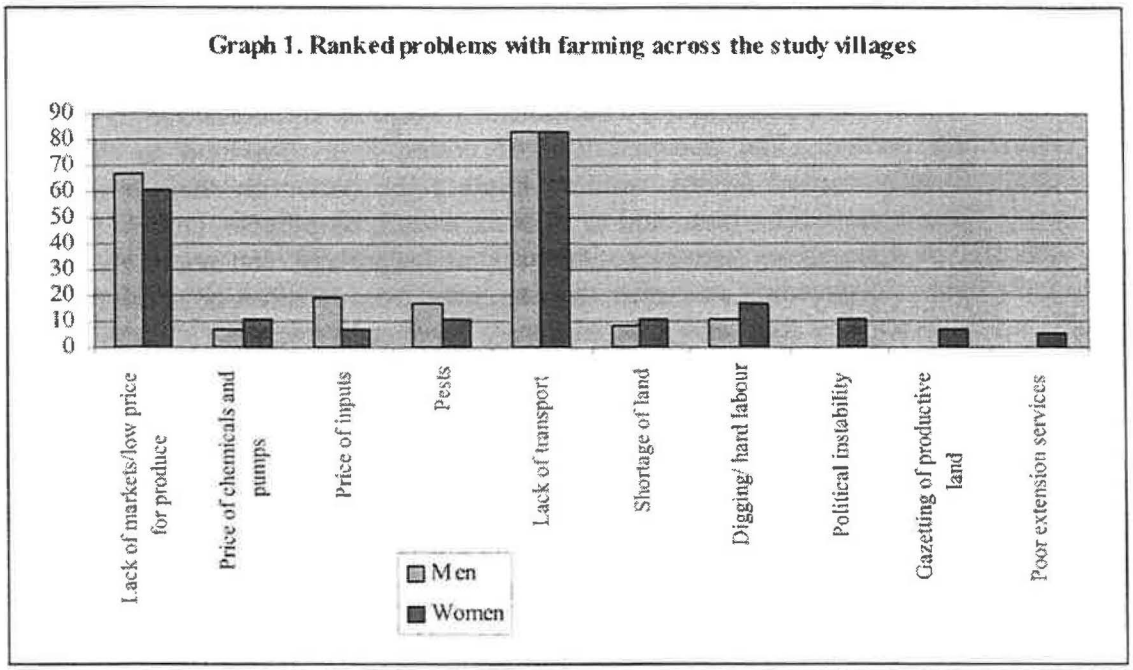


Table 26: Constraints	Kaswa II		Nyamusule		Kitakurura	
	Men	Women	Men	Women	Men	Women
Lack of markets/low price for produce	2nd	=3rd	2nd	2nd	1st	1st
Price of chemicals and pumps					5th	3rd
Price of inputs			4th		3rd	5th
Pests		=6th	3rd		6th	6th
Lack of transport	1st	1st	1st	1st	2nd	2nd
Shortage of land					4th	3rd
Digging/ hard labour	3rd	2nd				
Political instability		=3rd				
Gazetting of productive land (national park)		5th				
Poor extension services		=6th				

These two key constraints were identified by both men and women, with the exception of women in Kaswa II, who identified labouring as a bigger constraint than the low price that they gain for produce. Aside from the main constraints, the cost of inputs and pests were also highlighted as problems in more than one village. Women in Kaswa II, and men in Nyamusule voted more extensively for a range of problems, reflecting a belief that there are several constraints to improving farm productivity.

Overview of Marketing System in Kasese District – Household Survey Results

Table 27 highlights the extent to which food and cash crops such as coffee (85%), passion fruit (38%), cassava (36%), beans (28%) and cotton (25%) are sold by Kasese farmers. As for the quantities involved, only cotton (547kg on average per households that sell this crop), passion fruit (405kg), Irish potato (396kg), and cassava (282kg) are sold at quantities of above 200kg by the households that sell these crops. On average, only 134kg of the main cash crop coffee is sold per household.

The crops are almost exclusively stored at home. This includes cotton in the case of which 79% stored at home, and 15% at the village store / depot.

Most of the farmers in Kasese District surveyed tend to sell their crops at the village market (e.g. 64% of coffee sales, 74% of passion fruit sales, 79% of beans). Overall, selling of produce at the farmgate represents the second most important option, whereas some cash crops are also sold at the District market (e.g. 28% of coffee, and 16% of passion fruit), and cotton is primarily sold at the village store (i.e. depot of the co-operative society).

Most of the farmers sell the majority of their crop to non-local traders (e.g. 90% in the case of coffee, 74% passion fruit, and 74% beans). The proportions sold to village agents are comparatively modest (e.g. 8% of coffee, 18% of passion fruit, and 15% beans). Cotton is sold to the co-operative society (59%), non-local traders (25%), village agents (3%), and private company (13%).

The main reasons stated for selling the crops to these buyers include "believe this buyer offers a better price, 85%", "always sell to this person, 24%", "only known buyer, 39%", "due to lack of own transportation, 6%", and "because can't wait any longer to sell, 4%". Respondents could give up to two answers to this question.

According to village members in the three sub-counties, the average distances to the main markets are of the order of 17 kms (Kyabarungira), 14 kms (Mahango), and 8 kms (Nyakiyumbu) respectively.

Table 27: Crops Marketed in Kasese and Quantities Involved

	Crops marketed (% of households)	Quantities sold (mean kg per household)
Maize	13%	182
Rice	0%	-
Cassava	36%	282
Beans	28%	85
Sweet Potato	0%	-
Ground nuts	7%	81
Green Grams	2%	38
Banana	0%	-
Irish Potato	14%	396
Pineapple	1%	50
Passion Fruit	38%	405
Coffee	85%	134
Cotton	25%	547
Other	7%	193

Table 28: Storage Location - Kasese

	In Home	Village Store	Private Company	Elsewhere
Maize	100%	0%	0%	0%
Rice	-	-	-	-
Cassava	99%	1%	0%	0%
Beans	99%	1%	0%	0%
Sweet Potato	100%	0%	0%	0%
Ground nuts	100%	0%	0%	0%
Green Grams	100%	0%	0%	0%
Banana	99%	1%	0%	0%
Irish Potato	100%	0%	0%	0%
Pineapple	100%	0%	0%	0%
Passion Fruit	98%	2%	0%	0%
Coffee	99%	1%	0%	0%
Cotton	79%	15%	3%	3%
Other	100%	0%	0%	0%

Table 29: Location of Sale – Kasese

	From Home	Village Market	District Market	Village Store	Else-where
Maize	18%	82%	0%	0%	0%
Rice	-	-	-	-	-
Cassava	20%	80%	0%	0%	0%
Beans	21%	79%	0%	0%	0%
Sweet Potato	-	-	-	-	-
Ground nuts	0%	100%	0%	0%	0%
Green Grams	33%	67%	0%	0%	0%
Banana	-	-	-	-	-
Irish Potato	6%	83%	11%	0%	0%
Pineapple	100%	0%	0%	0%	0%
Passion Fruit	10%	74%	16%	0%	0%
Coffee	8%	64%	28%	0%	0%
Cotton	6%	25%	6%	63%	0%
Other	11%	89%	0%	0%	0%

NB: Percentages and quantities refer to those households that have sold some of the crops

Katakwi District

Adodoi village (Asamuk S/C). Household land holding is 5 acres on the average in this village. Land for rice is usually hired at UgSh15-20,000/= per acre. Preparation of land for cultivation has been by ox-plough except in the 80s when the hand hoe was used after the Karamajong had rustled all the oxen. Presently, farmers form groups of 3 households in case of ploughing and 5 households in case of weeding.

Table 30: Major crops grown in their priority, Adodoi village (Asamuk S/C)

Cash Crops	Food Crops	Surplus Crops
Rice	Cassava	Cassava
Green grams	Millet	Millet
	Sweet Potatoes	Sorghum
	Sorghum	Sweet potatoes
	Groundnuts	Groundnuts
	Sim sim	Sim sim
	Cowpeas	Cowpeas

Rice is grown mostly in swampy areas, which are not available to everybody. Ten per cent of households own land suitable for rice production. Other households have to rent the land, and travel some distance to farm it. It costs UgShs20,000/= to hire one acre of swamp land and UgSh10,000/= an upland farm. Rice has two seasons April – October (main) and July – December. Costs for rice production of one acre are illustrated in Table 31.

Table 31: Rice Production and Cost Involved, Adodoi Village (Asamuk S/C)

Activity	Cost per Acre (USh)
Rent	20,000
Land clearing	5,000
1st Ploughing	25,000
2nd Ploughing	25,000
1st Weeding	30,000
2nd Weeding	25,000
Harvesting	30,000
Total	**160,000**

Casual labour for weeding is paid at UgSh1,000/= per task for 4 hours a day. When the harvest is poor then, an acre yields 6 bags of paddy rice but when the harvest is good the yield could be as high as 10 bags. Rice is milled only in Soroti. Paddy rice is paid at UgShs300/= per kg at the farm gate. Paddy rice is transported to Asinge (7 km) or Ajaki trading centres by bicycle (c. 70 kg) for UgSh1,000/= UgShs600/= per kg to the dealers. Rice is always sold to middlemen. Selling rice in Soroti earns more than double that in local markets (UgSh650 /kg compared to UgSh300/kg).

Almost all households grow 0.5 acre of **green grams**. There are two seasons namely April – June (main) and July – September. The yield per acre is 140 kg. The farm gate

prices are USh170 at harvest and USh250 when scarce. Retail price in Ajaki/Asinge trading centres is UgSh500/= while in Katakwi town it is UgSh800/=. It seems there is lack of market information for the farmers.

The average area of **cassava** grown per household is 1 acre. Planting is in April – July and it matures in 1.5- 2 years. One acre yields 30 bags of fresh cassava tubers. If processing takes place then thirty bags of fresh cassava reduce to 15 bags of dried cassava and then ten bags of cassava flour. The farm gate price is UgSh5,000/= per dried bag of cassava. Retail price for ground cassava is UgSh100/= per kg. A bag of cassava flour weighs 100 kg. When farmers produce up to one tonne of dried cassava, then Dyna pick-ups are used to transport the cassava to distant places like Katakwi, Soroti and Mbale.

Groundnuts are mostly grown for home consumption. The surface cultivated is 1 acre on the average. The yield per acre is 6 bags of unshelled groundnuts. There are two seasons - April – August (main) and July – November. These when shelled turn into 2 bags of 100 kg each. The farm gate price for unshelled groundnuts is UgSh12,500/= per bag. One kg of shelled groundnuts is UgSh500/=, however, unshelling groundnuts is a tideous task. Therefore, farmers avoid it even when UgSh25,000/= extra income could be realised per acre.

Ogongora village (Orungo S/C). The average land holding here is 2-3 acres. On the average three persons work on the farm that is, the husband the wife and a school drop out. Preparation of land is by ploughing. Ten households own oxen and ploughs. The oxen are used for ploughing and ferrying grass. The benefits of owning oxen include mainly being able to cultivate more food. They do not have carts because they are not available. The oxen were acquired by, loan (subsequently paid back), selling more rice than usual, or "bride price" when a daughter got married. Problems associated with oxen are that they fall sick, especially with lung diseases, and women can not use them without the husband's assistance. Ploughs are widely available in local markets (cost UgSh75,000/-) and so are the spares. A pair of untrained oxen costs USh250,000/- and a single ox costs USh190,000/-.

All the farmers grow **beans** of various types. The seasons are March-May / June and, June-October. They don't grow more than about an acre and most plough before planting. However, some didn't have draught animals and a few cold not even afford to hire them. The hire charges depend on the state of the ground but typically it is USh20,000/- per acre. Farmers use 40 to 50 kg of seed. Weeding is done by hand only (oxen not used) usually by family labour but some labour could be hired. The harvest is head-loaded home, left to dry in the sun for up to a week (depending on weather) and then stored in bags. Each acre plot yields around 4 to 5 bags, i.e. 400 kg. If one has a lot of beans, one hires a vehicle to ferry it to Soroti. Transport to Acura by bicycle is UgSh1,500 per 100 kg and then UgSh3,000/= per bag by motor vehicle. In Soroti beans fetch 400/- per kg but they are usually sold locally (often to agents) for 300/- per kg. The bags of beans are ferried around the local villages on bicycles.

Last season the average cotton farm size was 0.25 acre. Cotton is planted in April and harvested from October to January. Yields for the 0.25-acre farm was 40 kg. There

was no buyer of the cotton. Farmers complained that the extension services were very poor. It is hoped that this season more cotton will be grown since the Government has launched a campaign to grow more cotton to enable the country realise its AGOA program to enter into the USA market.

Rice is planted in March-May and harvested September/October. Some farmers hire land at UgSh20,000/= per acre. Average crop production costs are as illustrated in Table 32.

Table 32: Agricultural Activities and Costs Involved, Ogongora Village (Orungo S/C)

Activity	Cost per Acre (USh)
Land clearing	2,000
1st Ploughing	20,000
2nd Ploughing	15,000
Weeding	55,000
Harvesting	15,000
Total	**107,000**

The average rice field size is 1.5 acres yielding 6 bags of paddy rice weighing 600 kg, which when milled weigh 300 kg. Paddy rice is sold at UgShs300/= at the farm gate. Some traders come from Soroti to buy paddy rice at UgSh270/= per kg. Rice is milled only at Soroti, where one kg of milled rice sells for UgSh600/=. Transport of a 100 kg bag to Soroti by bicycle is UgSh7,000/= while the charge by motor vehicle is UgSh3,500/= per bag.

Millet is mostly grown for home consumption. The average area for millet per household is 1 acre, which produces two 100 kg bags. The production costs for millet are much lower than those for the rice. Millet is planted in April and harvested in July/August. The farm gate price is UgSh300/= while in the market the price is UgSh400/= per kg. Transporting one bag of millet by bicycle to Soroti is UgSh7,000/=. Transportation of millet to Soroti by bicycle would fetch an extra UgSh3,000 per bag. Farmers are aware of the extra income but lack own bicycles.

Women grow groundnuts in gardens which are near their homes. They walk to the gardens and bring the produce home by head-loading. Women sell the groundnuts in the local market 3 times a week during the season, although every Saturday groundnuts are sold at the big market. They may spend 5 minutes to 3 hours on this. Groundnuts are sold in *tumpeco* cups for Ugsh100/- in the case of un-shelled produce and Ugsh200/- if it is shelled.

Apule village (Kapujan S/C) The average land holding here is 1-2 acres. Extra land for growing crops is hired in neighbouring Adodoi village (3 km away). Land is rented at UgSh20,000/= per acre per year. On the average, two persons work on the farm - the husband and the wife. Preparation of land is by ploughing. The costs for crop production are outlined in Table 33.

Table 33: Agricultural Activities and Costs Involved, Apule Village (Kapujan S/C)

Activity	Cost per Acre (USh)
Land clearing	10,000
1st Ploughing	15,000
2nd Ploughing	15,000
Weeding (Cassava)	20,000
Weeding (Millet)	25,000
Weeding (Sweet potatoes)	25,000

Regarding marketing, crop produce is sold at the village centre (1 km) or Toroma market (12 km). Produce is transported by head loading or bicycle bodabodas at Ugsh1,500/= per load. It takes 3 hours to reach Toroma market on foot. In October 2002, the crop market prices were as outlined in Table 34.

Table 34: Crop Prices in Kapujan S/C and Katakwi Town (USh / kg)

Crop Produce	Village Centre	Toroma Market	Katakwi Town
Cassava (kg)	1,500	1,800	2,000
Millet (Gorogo)	600	600	1,000
Groundnuts (kg)	-	2,500	3,000

Source: PRA, October 2002.

On the average a household grows 1 acre of Cassava and millet. Both crops are sold only when there is surplus after meeting food demands for the household. Cotton growing is not common. Rearing of pigs and chicken is common, with households owning on average two each of the animals. Millet is sold in Apapai Centre once a week on Saturday by head-loading the millet, which can take 40 mins to one hour. Women carry between 2 and 5 kg of millet to the market / centre.

Shopping is done in both at Mukura and Toroma. Toroma is a monthly Saturday market. The women walk and head-load, although sometimes they use husbands' bicycles. A single journey takes 4 hours. Mukura is a distant market where the villagers go once a year in December. One uses a boat or boda-boda to Koloin and taxi to Mukura leaving at 7.00 a.m. and arriving at 10.00. Return charges are USh1,000/- for the boat or *bodaboda* ride and USh500/- for the taxi.

Overview of Marketing System in Katakwi District – Household Survey Results

Tables 35 – 37 indicate to what extent relatively few farmers in Katakwi District produce crops for sale. This is reflected in the fact that no crop is sold by more than 15% of the households. The quantities sold are equally low (i.e. no household reported having sold more than 200kg of a particular crop).

Although these results may have been influenced (i.e. biased) by the fact that a large proportion of respondents in Katakwi District were not household heads, the figures are plausible in that it was highlighted above that the livelihoods of households in Katakwi are quite diversified with farming only playing a role amongst three or four other income generating activities.

Crops are mostly stored at home. Amongst those farmers that sell their crops roughly two thirds sell their crop at the village market and one third at the farmgate. Only a small percentage of farmers sell maize at the District market.

Selling to non-local traders (i.e. approx. 50 – 70% depending on the crops) is more common than selling to village agents (i.e. approx. 30 – 50%). However, 100% of cotton is sold to non-local traders. The main reasons stated for selling the crops to these buyers include "believe this buyer offers a better price, 68%", "always sell to this person, 39%", "due to lack of own transportation, 25%". Respondents could give up to two answers to this question.

According to village members in the three sub-counties, the average distances to the main markets are of the order of 11 kms (Asamuku), 12 kms (Orungo), and 25 kms (Kapujan) respectively.

Table 35: Crops Marketed in Katakwi and Quantities Involved

	Crops marketed (% of households)	Quantities sold (mean kg per household)
Maize	11%	81
Rice	4%	86
Cassava	13%	88
Beans	0%	-
Sweet Potato	7%	183
Ground nuts	8%	123
Green Grams	15%	66
Banana	0%	-
Irish Potato	0%	-
Pineapple	0%	-
Passion Fruit	0%	-
Coffee	2%	137
Cotton	1%	30
Other	12%	77

Table 36: Storage Location - Katakwi

	In Home	Village Store	Private Company	Elsewhere
Maize	95%	5%	0%	0%
Rice	100%	0%	0%	0%
Cassava	98%	3%	0%	0%
Beans	100%	0%	0%	0%
Sweet Potato	98%	2%	0%	0%
Ground nuts	100%	0%	0%	0%
Green Grams	96%	4%	0%	0%
Banana	100%	0%	0%	0%
Irish Potato	-	-	-	-
Pineapple	100%	0%	0%	0%
Passion Fruit	-	-	-	-
Coffee	100%	0%	0%	0%
Cotton	100%	0%	0%	0%
Other	97%	3%	0%	0%

Table 37: Location of Sale – Katakwi

	From Home	Village Market	District Market	Village Store	Else-where
Maize	36%	57%	7%	0%	0%
Rice	40%	60%	0%	0%	0%
Cassava	59%	41%	0%	0%	0%
Beans	-	-	-	-	-
Sweet Potato	22%	78%	0%	0%	0%
Ground nuts	0%	100%	0%	0%	0%
Green Grams	35%	65%	0%	0%	0%
Banana	-	-	-	-	-
Irish Potato	-	-	-	-	-
Pineapple	-	-	-	-	-
Passion Fruit	-	-	-	-	-
Coffee	33%	67%	0%	0%	0%
Cotton	0%	100%	0%	0%	0%
Other	31%	69%	0%	0%	0%

NB: Percentages and quantities refer to households that have sold at least some

NON-FARM INCOME GENERATING ACTIVITIES

The rural household economy in Uganda is composed of both farm and non-farm economic activities. Non-farm activities are diverse in type and scale, but evidence from recent studies concludes that they make a significant contribution to overall household income (Reardon, 1997). Further, they are in many cases reliant upon travel between villages and trading and larger centres, and thus are an important component of this rural travel and transport investigation.

A categorisation constructed through previous NRI research on the rural non-farm economy was drawn upon in this investigation as a template through which non-farm activities could be classified. Six categories of non-farm activity were identified.

- **traditional processing of primary products** (charcoal, beers, bark cloth etc)
- **trade in primary produce**
- **retail trade** in household goods, second-hand clothes, petrol
- **crafts** such as carpentry, brick-making, construction of water tanks, pottery, basket-making and weaving, crochet, knitting, making brooms, baking, tailoring
- **services**, including repairs and mechanics, preparation and sale of cooked food, running a bar, health care and midwifery, carrying water
- **waged or salaried work**, in government or NGO service (in the village or in the district headquarters).

Iganga District

Table 38 illustrates the types of non-farm economic activity present across Iganga district (study area), who within the household is primarily responsible, whether it is individual or group-based, and the main modes of transport utilised.

Table 38: Types of non-farm economic activity practiced in study area

Category	Non-farm activity	# of villages present (of 3)	Male or Female	Individual or Group	Main mode of transport used[1]
Trade in PP	Bean trading	3	Men	Individual	Foot
Trade in PP	Maize trading	3	Men	Individual	Foot
Trade in PP	Coffee trading	2	Men	Individual	Bicycle
Traditional Processing	Charcoal trading	2	Men	Individual & Group	Foot
Traditional Processing	Beer brewing/ selling	1	Women brew (men sell in one case)	Individual	Foot
Craft	Brickmaking	2	Men (young in one case)	Individual & Group	Bicycle
Craft	Carpentry	2	Men	Individual	Foot
Craft	Handicrafts	1	Women	Individual	Foot
Retail Trade	Shopkeeping	2	Men	Individual	Foot
Service	*Boda Boda*	2	Men	Individual	Bicycle
Service	Bicycle repair	1	Men	Individual	Foot
Service	Building	1	Men	Individual	Foot
Service	Selling cooked food	1	Both	Individual	Foot
Service	Traditional healing	1	Both	Individual	Foot

[1] Mode of transport. Whilst all of the non-farm activities involve travelling by foot, or utilise some form of human porterage, the bicycle is indicated where it was specifically raised by those engaged in the activity. Thus, it is not at the exclusion of other forms. Similarly, where foot is the main mode of transport used, other forms may also be used, but less frequently.

As Figure 38 illustrates, a considerable range of non-farm activity is being practised across the district, ranging from trade in primary produce (primarily beans, maize and coffee) to various services (including *boda boda* or bicycle taxi). The most common of these activities are trading (crops and retail), processing and crafts, found in two or more of the three study villages. By and large, these activities are practiced by individuals, with the exception of charcoal trading and brickmaking. This supports the findings of the farming systems investigation, which found little evidence of group-based activity across the study area.

Employment differentiation on the basis of gender is also evident from the results, with men responsible for the majority of these activities, in contrast with women who are predominantly farmers (even if they are not responsible for the sale of farm produce). The main mode of transportation used in these non-farm activities was found to be foot/ human porterage (when carrying loads), with the exception of coffee trading, brickmaking and *boda boda* (which by its nature involves bicycle travel). Again, this supports the farming system investigation, where little evidence of transportation (aside from human porterage) was found.

In view of the purpose of this study, to better investigate travel and transportation issues and needs, semi-structured group-based interviews were conducted with community members involved in two of the non-farm activities considered to use, or benefit most from improved transportation: brick making and *boda boda*.

Brick making. Brick making, evident in two of the three study villages, was found to be a relatively new form of economic activity. Like many small scale non-farm activities, those initiating brick making did so not due to an economic imperative, but as a response to rising rural incomes and the associated demand for housing and shops within their own villages. Thus, brick making began in both villages as a form of self-help, initially moving from one member's designated site for construction, making bricks, helping the construction of a house or shop, and then moving on to another members site. In this sense, at least at the beginning, this activity was not perceived to be a 'business' with opportunities for expansion, rather the servicing of an immediate need.

However, local (intra-village and inter-village) demand for construction materials, and construction itself, has risen due largely to the government's drive for universal primary education, and thus the construction of rural schools, and a similar drive for the improvement of rural health status through the expansion (in number and size) of rural health posts and hospitals. Further, the growth of religious faith in Uganda (both rural and urban), remains a constant source of work for builders, constructing and rehabilitating churches and mosques.

Brick making was found to be conducted in both formal and informal groups; the difference being that in the latter case, men come together purely to conduct the work

of brick making, and then disband. Thus the existence of the group is purely functional- and there is no sharing of costs or profits (the work is either conducted for free with the expectation of reciprocity at a later date, or some form of individual-to-individual payment is made). In other cases, exclusively when there has been a recognition of demand for bricks beyond local immediate need, the informal group has formalised to be a service provider for those requiring bricks within a wider, although still predominantly local area.

The composition of a brick making group is almost entirely young men, due largely to the physical requirements of this labour intensive work. The brick making process requires proximity to several raw materials: soil of sufficient quality (either clay or sandy loam- the latter being more common in Iganga due to the unavailability of clay), water and firewood. Thus, in terms of transportation, considerable human effort and time is spent collecting firewood (rarely nearby), water (typically nearer as water is essential thus is a primary criterion in the selection of the site for brickmaking) and soil (which is typically dug very close to the site). The biggest transportation pressure is the movement of completed bricks to the destination. Whilst brick making was focused on internal village needs, this presented few problems- with the use of bicycles to transport, but with the increasing demand from schools, health posts and churches within a 10 km radius- the groups are relying on buyers to rent or use their pick-up trucks to come and collect. Whilst this functions reasonably well, the lack of transportation was stated as a barrier to sourcing demand, and supplying as and when needed. It is common to find piles of bricks unutilised for the reason that the buyer has not turned up. Further, in one case, a brick making group is advertising it services to a broader market through a main road-side sign. The lack of transportation that can bear the load of a large number of bricks may not prevent the growth of a brick making enterprise, but potentially reduces the marketable area and the potential profits.

Current brick making involves few financial costs (moulds which cost USh2000 - 2,500 shillings each), but considerable amounts of labour (it requires intensive work for a period of 2-3 weeks), and natural resource costs (soil, firewood, water), thus has implications for environmental sustainability. Bricks are sold at approximately USh20 each.

As with most non-farm activities, brick making is perceived to be a subsidiary activity to farming, and thus is disbanded quickly if other higher priority time needs are pressing. Thus, any financial investment in transportation for the purpose of supporting brick making needs to be carefully assessed.

Boda Boda. *Boda Boda*, or bicycle taxi, was similarly found in two of the three study villages. It exists on an individual basis, and is conducted entirely by young men, to provide a service for various local transportation needs including persons and goods. Its utilisation is wide ranging, including the transportation of sick people to the nearest clinic or hospital, to the transportation of agricultural produce from the farm to homestead, or homestead to market.

In each village, a group of 5-10 men were found operating a boda boda service, and whilst they appear as a group, the physical union is based solely on a shared occupational 'class'. Each man and bicycle is hired by members of the village to

provide a transportation service, which varies in frequency and distance on a daily basis. In one case, a group of boda boda operators had been formed, but broke down due to 'political interference' – referring to internal disagreements over work allocation and profit shares.

The majority of bicycles are purchased second hand in the district capital or nearest large town, the oldest purchased in 1995, the most recent in 2002. As the majority of the population cannot afford to buy a bicycle, the implication is that these men have made sufficient profits from farm or other non-farm based activity to diversify into this, which becomes a quasi-full time activity. Whilst all boda boda drivers are engaged in farming or other income-generating activities, the status of owning a bicycle is such that rarely are they hired to others for use- thus depend on the priorities and time allocation of the owner as to its use- and thus the provision of a service.

The cost of used bicycles falls within the range of USh36,000 to USh68,000, depending on the age and quality, although the cost appears to have dropped over the past half-decade. A new bicycle purchased from Iganga Town costs USh100,000. The operating costs incurred by the drivers includes spokes (USh2,500), shafts (USh7,500) and chains at least annually due to the poor quality of the roads and tracks. Local repairers are in some cases boda boda operators, and charge varying fees, normally in the range of USh1,000-3,000 depending on the length and complexity of the task.

Boda boda charges vary considerably depending on distance, load and time. Common charges included USh2000 shillings for hiring a bicycle for the day, with operator; USh1000 shillings for carrying two or three sacks of produce to market at a distance of 7km; down to USh50 for carrying two jerry cans of water for construction purposes about 1km. No estimate was made of the returns to boda boda operators on the basis that it was difficult for them to state the number and value of trips taken over a particular period. However, it would be fair to state that over a period of two to three years - assuming the bicycle was purchased in reasonable condition, a healthy profit could be made on the basis that trips worth at least USh10,000 per month were made.

Kasese District

Figure 39. illustrates the types of non-farm economic activity present across Kasese district, who within the household is primarily responsible, whether it is individual or group-based, and the main modes of transport utilised.

Table 39: Types of non-farm economic activity practiced in study area

Category	Non-farm activity	# of villages present (of 3)	Male or Female	Individual or Group	Main mode of transport used[1]
Trade in PP	Tomato trading	1	N/A	N/A	Foot, pickup
Trade in PP	Coffee trading	3	Men	Individual & Group	Foot, pickup
Trade in PP	Cotton trading	1	N/A	Individual	N/A
Trade in PP	Passion fruit trading	1	N/A	N/A	Foot
Trade in PP	Dried fish trading	3	Women	Individual	Foot
Traditional Processing	Charcoal trading	1	Men	Individual & Group	Foot
Traditional Processing	Beer	1	N/A	N/A	Foot
Traditional Processing	Bee keeping	1	N/A	Group	Hand
Traditional Processing	Logging	1	Men	Individual	Foot
Craft	Brickmaking	2	Men	Individual & Group	Foot
Craft	Carpentry	2	Men	Individual	Foot
Craft	Handicrafts	1	N/A	Individual & Group	N/A
Craft	Building	1	N/A	N/A	Foot
Retail Trade	Shopkeeping	3	Men	Individual	Foot
Service	Water carriers	1	N/A	N/A	Foot
Service	Firewood collection and sale	1	N/A	Individuals	N/A
Salaried work	Teaching	2	Both	Individual	Foot

N/A Where no answer is given, it is because the question was not asked in the particular village where the activity was found.

[1] Mode of transport. Whilst all of the non-farm activities involve travelling by foot, or utilise some form of human porterage, the bicycle is indicated where it was specifically raised by those engaged in the activity. Thus, it is not at the exclusion of other forms. Similarly, where foot is the main mode of transport used, other forms may also be used, but less frequently.

As Table 39 illustrates, a considerable range of non-farm activity is being practised across the district, ranging from trade in primary produce (primarily coffee and fish), crafts, sevices and salaried employment. The most common of these activities are trading (crops and retail), crafts and salaried employment, found in two or more of the three study villages. By and large, these activities are practiced by individuals, with the exception of brickmaking and handicrafts. This supports the findings of the farming systems investigation, which found little evidence of group-based activity across the study area.

Employment differentiation on the basis of gender is also evident from the results, with men responsible for the majority of these activities, in contrast with women who are predominantly farmers (even if they are not responsible for the sale of farm produce). The main mode of transportation used in these non-farm activities was found to be foot / human porterage (when carrying loads), with the exception of certain forms of trading, where pick-ups were found to be hired in certain cases. Again, this supports the farming system investigation, where little evidence of transportation (aside from human porterage) was found.

In view of this purpose of this study, to better investigate travel and transportation issues and needs, semi-structured group-based interviews were conducted with community members involved in two of the non-farm activities considered to use, or benefit most from improved transportation: trading in primary produce, brickmaking and bee keeping.

Trading in primary produce. Trading in primary produce is an income generating activity found across the study area, differentiated by product according to what is grown or produced (including, for example, coffee, beans, cotton and dried fish). Trading of cash crops was found characteristically to be an activity of young men, exploiting the lack of internal cohesion and organisation in most rural communities by purchasing the products in reasonable bulk, in some cases transporting, and selling in markets or to wholesale buyers. By contrast, women were identified as food crop or fish traders[33] (albeit fewer in number than their male counterparts). The number of traders found relating to each product varies considerably, with up to 1/3 of men interviewed in one village (Nyamusule) found to trade coffee, in contrast with one or two trading passion fruit.

In the case of coffee, the trade is controlled by one or two main village agents, who are typically associates, working together and hiring others to collect the coffee. They are the most likely rural dwellers to make use of motorised forms of transportation, taking advantage of bulk gathering of coffee, assessing demand in local markets, and hiring a pick-up to collect the produce. For less bulky or less grown products, such as passion fruit, traders hire 'porters' to carry the crop to market, not being of sufficient quantity and thus value to justify the hiring of a motorised vehicle.

Bean traders were found in one village, Kaswa II, purchasing house to house with quantities determined by demand at the local markets, and the amount of disposable cash the traders have available. These traders were found to operate in a loose confederation, helping each other out in terms of market information, but buying and selling on an individual basis. Beans are transported from Kaswa II on foot, with traders stating that due to the inaccessibility of the village, the cost of hiring a pick-up would be too high to be economic. There was an interest in the possible use of donkeys, but little experience of using them.

Brick making. Brick making, found in two of the three study villages, was found to be a relatively new form of economic activity. Like many small scale non-farm

[33] Fish trading in Nyamusule was exclusively practised by women who carry the fish from the lake to the village for sale.

activities, those initiating brick making did so not due to an economic imperative, but as a response to rising rural incomes and the associated demand for housing and shops within their own villages. Thus, brick making began in both villages as a form of self-help, initially moving from one member's designated site for construction, making bricks, helping the construction of a house or shop, and then moving on to another members site. In this sense, at least at the beginning, this activity was not perceived to be a 'business' with opportunities for expansion, rather the servicing of an immediate need.

However, local (intra-village and inter-village) demand for construction materials, and construction itself, has risen due largely to the government's drive for universal primary education, and thus the construction of rural schools, and a similar drive for the improvement of rural health status through the expansion (in number and size) of rural health posts and hospitals. Further, the growth of religious faith in Uganda (both rural and urban), is a potential source of work for brickmakers and builders, constructing and rehabilitating churches and mosques.

Brick making was found to be conducted in informal groups, with men coming together during the dry season (January-July) to make bricks and aid in construction. In one case, the existence of the group is purely functional- and there is no sharing of costs or profits (the work is either conducted for free with the expectation of reciprocity at a later date, or some form of individual-to-individual payment is made). In the other, when there has been a demand for bricks beyond local immediate need, the informal group has formalised to be a service provider for those requiring bricks within a wider, although still predominantly local area.

The composition of a brick making group is almost entirely young men, due largely to the physical requirements of this labour intensive work. The brick making process requires proximity to several raw materials: soil of sufficient quality (either clay or sandy loam), water and firewood. Thus, in terms of transportation, considerable human effort and time is spent collecting firewood (rarely nearby), water (typically nearer as water is essential thus is a primary criterion in the selection of the site for brickmaking) and soil (which is typically dug very close to the site). The biggest transportation pressure is the movement of completed bricks to the destination. Whilst brick making was focused on internal village needs, this presented few problems- with the use of bicycles to transport, but with the increasing demand from schools, health posts and churches within a broader radius- the groups are relying on buyers to rent or use their pick-up trucks to come and collect. Whilst this functions reasonably well, the lack of transportation was stated as a barrier to sourcing demand, and supplying as and when needed.

Current brick making involves few direct financial costs (moulds which cost USh3,000 shillings each), but considerable opportunity cost - labour (it requires intensive work for a period of 2-3 weeks), and natural resource costs (soil, firewood, water), thus has implications for environmental sustainability. Bricks are sold at between USh25-40 each depending on the size.

As with most non-farm activities, brick making is perceived to be a subsidiary activity to farming, and thus is disbanded quickly if other higher priority time needs are

pressing. Therefore, any financial investment in transportation for the purpose of supporting brick making needs to be carefully assessed.

Bee keeping. Two groups of bee keepers were found in and around Nyamusule village. Both groups had been started within the past 12 months, supported by the department of agriculture at the district government office. Whilst the capital costs of initiating the activity were found to be high (one group has 20 hives, costing on average USh15,000 Shillings), the market value of honey is also high, one jerry can valued at USh70,000. One of the groups is already selling honey to a local hospital, and has sourced markets in a neighbouring district where the market price was estimated to be between USh120,000-140,000. The barrier to selling in this district was sufficient income to pay for transportation to better understand the market potential and sell. However, it was expected that income from local sales would facilitate this over the medium-term.

Katakwi District

In **Adodoi** the most **important income-generating activities** (IGAs) for men were selling the main food crops (rice, cassava and groundnuts – only the last two were shared by women), whilst the most important IGAs for women were brewing, fishing and selling grass. Thus, the women would have lower transport needs than the men.

Orungo village is surrounded by swamps, which are fully utilised by several fishermen. Mudfish is the only species available. A daily catch is about ten fish selling for UgSh500-600/= each. Each fisherman catches fish three times a week.

Few men are involved in brick making, which is mainly a women's activity. It is done mainly in the dry season (Dec to early Mar) to avoid disruption by rain. There seems to be a dwindling market for bricks now so production is going down (and so, as a result, is income). Bricks are sold mainly in Katakwi but that is too far for oxen to take them (and they are busy ploughing). A pick-up from Katakwi costs 40,000/- to 60,000/-. There is plenty of wood around for firing the bricks. It is either carried by shoulder-loading or pulled by oxen. A brick is sold for 50/-.

Income generating activities for women in **Apule village** include local brew selling and handicrafts selling. Beer is sold in Apapai Centre. The women head-load one jerry can of 20 liters and hand-load 10 to 15 liters of local beer (*ajona*) once a week on any day. It takes 40 min to one hour.

Regarding handicrafts, the women make baskets. Raw materials such as papyrus are obtained from the lake and sisal is bought from the Centre.

THE RURAL TRANSPORT SYSTEM

The rural transport system is composed of two main factors: the road infrastructure and the means of transportation available and used. In the context of this project, particular attention is paid to the knowledge and use of intermediate means of transportation as the entry point for action research. Nevertheless, infrastructure is very important in terms of access and use by particular vehicles.

Means of Transportation

The knowledge and use of various modes of transportation in the Districts is central to this study of transportation needs. Participatory assessments conducted in the nine study villages sought to investigate this knowledge and use within the context of their primary economic and social activities and associated transport needs. Based on the hypothesis that the most appropriate forms of transport may fall within the category of 'intermediate', i.e. known, affordable, available and adaptable, transportation knowledge and use was divided into three groups: motorised, intermediate and human.

The knowledge and utilisation of motorised transport across the study area was investigated through identification of varying modes, followed by a count of utilisation over three time periods: the last 24 hours, the last month and the last year. With this information, it is possible to construct a simple profile of utilisation. This counting exercise was divided by gender, in accordance with prior knowledge of differing levels of usage, and differing needs. By categorising transportation utilisation according to village, mode and gender, the aim was to get a view of differential access, enabling accurate targeting through the next phases of this action research.

Used transport means by inhabitants of the nine PRA sub-counties in the three districts are shown in Tables 40 - 49. There are differences and similarities regarding the use of various transport means in the three districts.

Motorised Transport

Iganga District

The mostly flat Iganga District which is located in the east of Uganda on the border with Kenya, and is on the main corridor to the Kenyan port of Mombasa benefits from major transport links and consequently is served with a wider range of motorised transport. Motorised means of transport mentioned included motorcycle, tractor, pick up, minibuses, bus, lorry and car. Minibuses and motorcycle are used more prominently in Bukanga sub-county than Makuutu and Ivukula that are more remote.

Table 40: Motorised Means of Transport Used Last Year in Iganga District

Sub-county	Means of transport	Men	Women
Makuutu	Motorcycle	11%	5%
	Pickup	2%	0%
	Mini-buses	23%	5%
Bukanga	Motorcycle	38%	36%
	Pickup	12%	32%
	Mini-buses	77%	86%
	Bus	15%	0%
	Tractor	15%	0%
	Car	15%	0%
Ivukula	Motorcycle	38%	30%
	Pickup	30%	6%
	Mini-buses	26%	47%
	Bus	48%	41%
	Lorry	7%	6%
	Car	5%	30%

Source: PRA group exercises

In Iganga District, three main reasons were given for paying for a ride on a motorcycle: health (taking sick people to clinic or hospital), economic (business in urban centres) and social (funerals, social visits to family). As few, if any of the sub-counties contained people who own motorcycles, the trip involves an initial walk or bicycle ride to the nearest site (typically a trading centre) where a motorcycle ride can be obtained. Typically, this will involve travel of between 2 and 10 km to the site of motorcycle, followed by trips on the motorcycle that vary considerably in distance, ranging from 15 to 50 km depending on the need. Similarly, minibuses serve the same function, but over a greater distance. Due both to comfort, speed and cost, a minibus is preferred when travelling for health, economic or social reasons where the destination is in the range of 20 to 200 km.

Of the other motorised forms of transport used, the bus serves a similar function to both motorcycles and minibuses, but over a greater distance still. Buses are typically used for long distance travel to major urban centres – notably Kampala – and for long distance travel for social reasons, particularly funerals. To cover these distances (typically in the region of 100 km or more), the bus is a more economic form of transportation, but is slower than a minibus.

The remaining forms of transport used by male members of the villages in the study area relate more directly to the transportation of goods. Interestingly these forms (pick-up, lorry and tractor) were far less used over the past year than the modes used primarily for personal travel, reflecting the low utilisation of these motorised vehicles for the purpose of their main economic activity, farming. Of these, the pick-up was the most used, with between 2% -30% of men having utilised this form of motorised transportation at least once in the past year. This variation to an extent reflects accessibility – with Makuutu, the sub-county with poorest access reflected in the 2% of men who have utilised a pick-up over the past year. However, Bukanga, with the best accessibility was found to have a lower percentage of men who had utilised a pick-up (12%) than in Ivukula (30%). When identifying the reasons for hiring a pick-up, members of Bukanga were found to have a wider array of reasons than the other two sub-counties, including the transportation of construction materials (sand, bricks,

etc), carriage of crops (particularly maize, cassava, rice and millet) and charcoal. Whilst the reasons do not vary between the villages, the greater number of uses in Kisega suggests that they have better access to this type of transport, and thus for expediency it is better utilised.

There is a strong resemblance with the motorised modes used by women and those by men, with motorcycles and minibuses predominating. This is unsurprising, as these are the main modes available to members of the three study sub-counties.

Over the past year, the percentage of women using motorcycles was lower than for men, whilst the use of minibuses was higher in two of the three sub-counties. This may be explained by the reasons for use, predominantly travel to health clinics/ hospitals and for social visits (including funerals). In the case of health visits, the responsibility typically rests on women, taking children for immunisations or for curative care. The use of buses was found to be almost equal between women and men, suggesting that for longer trips (typically for social reasons), women and men travel together.

In general, fewer women than men appear to have used the transport modes utilised for the movement of goods, namely pick-ups and lorries. However, there is an exception to this pattern, with 32% of women in Bukanga stating that they have used a pick-up in the past year, in contrast to 12% of men. Whilst this may not be easily explainable, it could relate both to the relative emancipation of women in this village (as evidence by the percentage that ride bicycles- see later section). No women had hired the use of a tractor, thus implying that whilst rare in the case of men, it remains in the male domain.

The pattern of motorised transport use for the movement of goods favours men, with the exception of one of the three villages. Whilst it is commonly found that men capture the means of transportation due to cost and status, the fact that no village members own these modes (in all cases people are paying for a ride, or hiring), may explain the generally high female utilisation.

Kasese District

Accessibility to, and use of the different motorised forms was found to vary considerably in Kasese District. Men used mini-buses and motorcycles in two of the three sub-counties, but to a limited extent (less than 20%). By contrast, over 60% of men in the third sub-county (Mahango) had used a pick-up in the past year, but none had used motorcycles, and just over 10% had used a minibus.

The pattern for female use of motorised transportation across the three sub-counties shows a similar pattern, but with slightly different emphasis (Table 41). Whilst almost 30% of men had used a minibus over the past year in Kaswa II, no women had. By contrast, whilst no men had used a minibus over the past year in Mahango, over 30% of women had. Women have not used motorcycles at all in two of the three sub-counties, whilst men over the same time periods have used them, albeit in a limited way. Due to the remoteness of the location, the women of Kaswa II village (Kyabarungira) appear to be considerably more constrained in their use of transport than the women in the other two sub-counties.

Table 41: Motorised Means of Transport Used Last Year in Kasese District

Sub-county	Means of transport	Men	Women
Nyakiyumbu	Motorcycle	22%	22%
	Pickup	16%	16%
	Mini-buses	10%	10%
Kyabarungira	Motorcycle	5%	0%
	Mini-buses	27%	10%
Mahango	Pickup	67%	42%
	Mini-buses	42%	33%

Source: PRA group exercises; Nyakiyumbu data was not collected in a disaggregated (female / male) form.

Across the three sub-counties, the residents of Nyakiyumbu were found to have the best access to the range of different motorised forms of transport. This reflects their transhumant pattern of mobility – with their time spent in the plains near the cotton fields in the temporary village enabling them access to various forms of transportation. Whilst Mahango itself is inaccessible, the residents have access to transport at the foot of the escarpment (15 km foot descend to a plateau walking which is accessible to pick-ups and other motorised vehicles. Although the use of pick-ups by residents of Mahango is primarily for collecting coffee these vehicles are then also exploited for use in carrying other purposes: carrying *Matoke*, agricultural products and retail goods, timber and sick persons.

Aside from Mahango, and the temporary village which the residents of Nyakiyumbu use periodically, the study villages themselves appear to have limited access to motorised transport, with motorcycles and minibuses alighted from nearby centres, not in the villages themselves. No evidence of motorcycle ownership was found in any of the villages, thus it reflects travel from intermediate centres to and from larger settlements or occasionally the fields (notably in the case of Mahango around the temporary settlement).

Three main reasons were given for paying for a ride on a motorcycle: health (taking sick people to clinic or hospital), economic (taking coffee to the buyers, travelling to and from fields) and social (personal visits). Typically, this will involve travel of between 2 and 10 km to the site of motorcycle, followed by trips on the motorcycle that vary considerably in distance, ranging from 15 to 50 km depending on the need. Similarly, minibuses service the same function, but over a greater distance. Due both to comfort, speed and cost, a minibus is preferred when travelling for health, economic or social reasons where the destination is in the range of 20 to 200 km.

Katakwi District

Katakwi District is located north of Soroti District and is bounded by Moroto District in the north, Nakapiripirit in the east, Kumi in the south and Lira in the west. Katakwi is mostly flat traversed with several main and small rivers joining swamps. It is traversed southwest to northeast by an all weather loose surface road from Soroti to Moroto through Katakwi District headquarters. There are four other all weather roads,

one traversing Kapujan sub-county, one running westwards from the Soroti - Katakwi main road all the way to Lira District traversing Amuria and Orungo sub-counties, and one running northwards to Pader District from Ochomal. Only the road link, Soroti-Moroto, is served with large buses from Kampala to Moroto. The other links are served with minibuses, motorcycles and pickups. Other motorised means of transport mentioned included motorcycle, tractor, bus, lorry and car. Minibuses, motorcycle, pick-ups and buses are used more prominently in Orungo and Kapujan sub-counties than Asamuk that is more remote. In Asamuk, only government officials use motorcycles. The lorry is fairly utilised by men in Orungo, hardly in Asamuk and none in Kapujan. The tractor is only used to a small extent (6%) by men in both Asamuk and Orungo.

Table 42: Motorised Means of Transport Used Last Year in Katakwi District

Sub-county	Means of transport	Men	Women
Asamuk	Motorcycle	6%	11%
	Pickup	18%	50%
	Min-buses	21%	11%
	Bus	9%	22%
	Lorry	3%	6%
	Tractor	6%	0%
	Car	12%	0%
Orungo	Motorcycle	23%	36%
	Pickup	46%	27%
	Mini-buses	32%	9%
	Bus	47%	36%
	Lorry	35%	0%
	Tractor	6%	0%
Kapujan	Motorcycle	43%	0%
	Pickup	46%	0%
	Mini-buses	57%	63%
	Bus	52%	31%

Source: PRA group exercises

In Katakwi District, three main reasons were given for paying for a ride on a motorcycle: health (emergency such as taking sick people to clinic or hospital), economic (business in urban centres and market) and social (funerals, social visits such as weddings). None of the sub-counties contained people who own motorcycles. The trip involves an initial walk or bicycle ride to the nearest site (typically a trading centre) where a motorcycle ride can be obtained. Typically, this will involve travel of between 1 and 8 km to the site of motorcycle, followed by trips on the motorcycle that vary considerably in distance, ranging from 5 to 40 km depending on the need. Similarly, minibuses service the same function, but over a greater distance. Due both to comfort, speed and cost, a minibus is preferred when travelling for health, economic or social reasons where the destination is in the range of 20 to 200 km.

Of the other motorised forms of transport used, the bus serves a similar function to both motorcycles and minibuses, but over a greater distance still. Buses are typically used for long distance travel to major urban centres – notably Mbale, Jinja and Kampala, carrying chicken and bags of grains, cassava flour, etc. – and for long

distance travel for social reasons, particularly funerals and weddings. To cover these distances (typically in the region of 150 km or more), the bus is a more economic form of transportation, but is slower than a minibus.

The remaining forms of transport used by male members of the villages in the study area related more directly to the transportation of goods. Interestingly, the pick-up was used over the past year by men with the same intensity (40%) with the exception of Asamuk (18%) as the modes used primarily for personal travel (31-57%) for minibuses, reflecting the dual-purpose usage for the pickup as a passenger and goods vehicle especially to distant markets. This variation to an extent reflects level of production as the pick-up is used for transporting rice, millet, sorghum, beans and groundnuts – with Orungo and Kapujan, the sub-counties that are more productive having 46% and 43% respectively of men who have utilised a pick-up over the past year. However, when identifying the reasons for hiring a pick-up, the men of Asamuk sub-county included the transportation of construction materials (sand, bricks, etc).

There are some differences with the motorised modes used by women and those by men, with women not using tractor and lorry in both Asamuk and Orungo. However, the other modes including motorcycle, minibus, pick-up and bus are fairly used in more or less the same intensity by both men and women. This is unsurprising, as these are the main modes available to members of the three study sub-counties.

Over the past year, the percentage of women using motorcycles was higher than for men in both Asamuk and Orungo, whilst the use of minibuses by men was higher in the two sub-counties. Women in Kapujan do not use pick-up and motorcycle at all. However, use of minibus by women in Kapujan is 63% compared to 11% and 9% for Asamuk and Orungo respectively. This may be explained by proximity to Katakwi headquarters and the reasons for use, predominantly travel to health clinics/ hospitals. In the case of health visits, the responsibility typically rests on women, taking children for immunisations or for curative care. Kapujan is nearer (15 km) to the district referral hospital at Katakwi than the other sub-counties (50-100 km). The use of buses was found to be almost equal between women and men, suggesting that for longer trips (typically for social reasons), women and men travel together.

In general, fewer women than men appear to have used the transport modes utilised for the movement of goods, namely pick-ups, lorries and tractor. However, there is an exception to this pattern, with 50% of women in Asamuk stating that they have used a pick-up in the past year, in contrast to 18% of men. Whilst this may not be easily explainable, it could relate to the relative scarcity of minibuses in Asamuk.

Intermediate Means of Transportation

Intermediate means of transportation (IMTs) identified by the PRA participants (men and women) include the bicycle, ambulance stretcher, wheelbarrow, sledge, ox-cart, donkey, boat and bicycle. These modes are considered 'intermediate' as they bridge a gap between motorised forms and human-loading, although not serving the same function in every case (i.e. IMTs are not substitutable for certain forms of motorised transport that carry passengers and goods long distances). However, IMTs, the focus of this action research, are deemed to be potentially viable in areas where access is not

particularly good, incomes are low, motorised transport services largely unavailable, but surplus production (for sales purpose) is available.

Iganga District

In Iganga District, only three IMTs namely, bicycle, wheelbarrow and ox-cart were identified. The bicycle is unique within this group of IMTs as it is the only form that is used to transport both passengers and goods. All of the other modes identified are solely for the purpose of transporting goods, and within this group the percentage of men who have used them is very low. The most used is the wheelbarrow (i.e. 54% in Bukanga, and 13% in Ivukula, respectively), using it to transport building materials, manure to the fields, and crops from the fields. However, ownership of wheelbarrows in the three sub-counties is very low (i.e. 4% for Bukanga and 2% for Ivukula and Makuutu), but individuals hire one from time to time for specific purposes. This IMT is appropriate for transporting reasonable weights relatively short distances (one man can push a wheelbarrow carrying up to 80kg or 1 bag of maize or manure or construction material).

History of bicycle use in Kisega Village, Ivukula Sub-County
The first bicycle in the village was purchased by the sub-county chief in about 1940. By 1998 the number of bicycle owners had risen to 8, thanks to the proceeds from the sales of cotton, rice and maize. (source: key informant interview, 04/10/02)

Bicycle use is high for men in each sub-county (i.e. 78% - 92%) over the past year. The main reasons for using a bicycle include personal travel (to a clinic or hospital, visiting friends or relatives and attending funerals), and transporting food and non-food items (water, crops from the field to home, crops from home to mill or to market).

'Rolling', found only in Bukanga, is a means of transporting molasses in drums of 250 kg from the field to the home. Whilst this is appropriate for this particular material, it has no wider applicability.

Table 43: Intermediate Means of Transportation Used Last Year in Iganga District

Sub-county	Means of transport	Men	Women
Makuutu	Bicycle	85%	69%
Bukanga	Wheelbarrow	54%	0%
	Bicycle	92%	100%
	Ox-cart	4%	0%
Ivukula	Wheelbarrow	13%	0%
	Bicycle	78%	79%

Source: PRA group exercises

Men in very few cases have used oxen-drawn carts over the past year in two of the three villages. Only in Ivukula had oxen and carts been used for transportation purposes - moving building materials from one location to another, and carrying maize from the fields to the homesteads. In the other village that have had (minimal) use of oxen, they have been used as draft power for squeezing sugar cane for extraction, and have not been used either for ploughing or fixed to a cart for the transportation of goods.

History of oxen use in Kisega Village, Ivukula Sub-County

The first evidence of the use of a plough drawn by oxen was during the 1950s when a number were used. By the 1960s, only two ox-drawn ploughs were being used. These ploughs were being rented to 5-6 men per season for use in their fields. Currently there are 10 ox ploughs, owned by 10 different households. These are rented out to others at UgSh15,000/= per acre ploughed.

Ox-carts began to be used in the 1990s, and have been seen to carry up to 10 bags of maize. However, they have not taken off locally due to the lack of parts (particularly wheels), and the purchase price, estimated at UgSh500,000 each. (Source: key informant interview, 04/10/02)

Donkeys, the final IMT identified, was known of by members of two of the three PRA villages, seen by some, but used by none. This is unsurprising considering the exceptionally flat topography of the district.

Amongst women, the pattern of IMT usage is far narrower; the bicycle being the only mode used. Women usage of a bicycle for transportation in the last year was 100%, 79%, and 69% for Bukanga, Ivukula and Makuutu respectively. Whilst these figures equate to those of men, it does disguise the frequency of use. Through observation and informal discussion with village members it was found that men use bicycles more frequently than women, reflecting the fact that ownership is entirely in the hands of men, and only in Bukanga were women found that knew how to ride. This reflects a cultural norm in which men dominate ownership and control over the means of transportation. Bicycle ownership in Iganga is 100% for Makuutu and 76% for both Ivukula and Bukanga.

Kasese District

As the results indicate, few IMTs exist in Kasese district, and of those that do, their use is extremely variable. Bicycles are common in Nyakiyumbu, which is partly flat, with nearly one third of residents having used one last year. This contrasts with Kyabarungira where very few men (9%) and no women had used a bicycle in the last year, primarily due to the hilly terrain, and thus inappropriateness of this form.

Table 44: IMTs Used Last Year in Kasese District

Sub-county	Means of transport	Men	Women
Nyakiyumbu	Stretcher	23%	23%
	Bicycle	27%	27%
Kyabarungira	Stretcher	86%	0%
	Bicycle	9%	0%
Mahango	Stretcher	63%	17%
	Bicycle	52%	13%
	Donkey	2%	0%

Source: PRA group exercises; Nyakiyumbu data was not collected in a disaggregated (female / male) form.

In Nyakiyumbu, bicycles were found to be used for three main purposes: the transportation of people to and from the fields and to nearby towns (the furthest recorded distance was 80 km to a bigger town); the carriage of products – crops, food and water; and the carriage of sick people to the clinic or hospital. Local repair services were found to be available in the PRA village - workshops manned part-time by farmers. Spare parts were also available, but the cost of purchasing a bicycle was still found to be beyond the means of most households at between UgSh80,000-100,000 each. Consequently, those that own bicycles are considered to be relatively affluent.

People from Mahango reported the availability of bicycle hire (*boda boda)* nearby the PRA village, which was used to carry people to the lake for fishing, and to Kasese Town. A lift was quoted as costing 500 Shillings to the lake from the bottom of the hill outside of the village, and a further 500 Shillings to Kasese. Bicycle ownership by households is 21% in Nyakiyumbu compared to 9% in Kyabarungira and 2% in Mahango that are hilly. The District average of 11% is much lower than Iganga (84%) and Katakwi (34%). Both Iganga and Katakwi are relatively flat.

The stretcher is used solely for carrying sick people, and has no wider application. This can be used over quite long distances, in the case of Nyakiyumbu, approximately 8 km from the temporary village to Bwera hospital, or 20 km if from the villages up the mountains. The stretcher requires two adults (typically men) to carry it, and is thus a considerable time and effort burden over these distances. The high use last year (ranging from 27% of men in Nyakiyumbu to 86% of men in Kyabarungira) suggests that not only have a lot of people become ill, but that other forms of transport are required to save this labour, and give those sick a greater chance of recovery.

A different form of stretcher was also found in Nyakiyumbu temporary village, used to carry sacks of cash crops over short distances (typically in the range of 0-0.5 km).

Donkeys were not found in any of the PRA villages, although 2% of men from Mahango had used them in the past year whilst outside of the village[34].

[34] The history of introducing donkeys into Kasese is plagued with lack of sensitisation and education and poor management, leading to wide-scale derision amongst the rural populous of their value as pack animals. An evaluation of donkey introduction into the district (through a GTZ-Government of Uganda scheme, Kawanda Research Institute Post-Harvest Programme and UNICEF) concluded "the majority of donkeys died with the rest left redundant, due to the inability of the mainly female owners to afford drugs for the treatment of the animals. Further, that the mismanagement of the project (GTZ-GoU) by local politicians had meant that those who received the animals were not that concerned over their welfare and un-educated about their maintenance, leading to their death or misuse." (Iga,2000).

Katakwi District

Few IMTs including wheelbarrow, sledge, bicycle, ox-cart, boat and bicycle-trailer (only identified in the household statistical survey) exist in Katakwi district. There are no animal-drawn carts in Asamuk and there are a few sledges but the paths are not suitable for a sledge. Kapujan represents an interesting case in that it makes most use of ox-carts, and boats (due to Lake Bisina) and bicycles are the two most used IMTs.

Table 45: IMTs Used Last Year in Katakwi District

Sub-county	Means of transport	Men	Women
Asamuk	Wheelbarrow	3%	0%
	Sledge	21%	0%
	Bicycle	79%	61%
	Ox-cart	0%	0%
Orungo	Wheelbarrow	37%	0%
	Sledge	49%	0%
	Bicycle	75%	82%
	Ox-cart	4%	0%
Kapujan	Wheelbarrow	48%	19%
	Sledge	76%	38%
	Bicycle	100%	83%
	Ox-cart	48%	0%
	Boat	90%	100%

Source: PRA group exercises

The IMTs are fairly used by men with a high of 100% and 48% for the bicycle and ox-cart in Kapujan and a low of zero and 21% for ox-cart and sledge in Asamuk. The boat in Kapujan is used by 90% of the men. Women use bicycles (61-83%) too, it is not a cultural issue in Teso land. However, women do not use ox-carts, wheelbarrows and sledges except in Asamuk.

Ox-carts are reportedly too expensive for the inhabitants to own even when the oxen are already available and unutilized during off-peak agricultural seasons. YWAM located at Katakwi town, has designed relatively cheap experimental carts but no interest for adoption has been generated. Neighbouring Karamajong uses donkeys for transport and they are relatively cheap and could be barter traded for goats and grains but no one in Katakwi has picked up interest in using the donkeys. It was felt that ox-carts and donkey-carts would help meet transport needs but concern was expressed over the management of donkeys if there was not a good balance of male and female animals.

Human Porterage

People carrying loads using only their own person, human porterage, is considered to be the most common mode of transport utilised in rural Africa. The findings obtained from the surveys reinforce this picture for the Uganda case, in that here also human loading is the most common mode of transport at community level. Various forms of human porterage were identified by members of the PRA villages; shoulder, head,

hand and back loading. Each serves a different and/or overlapping purpose depending on the size and nature of the load, and the number of loads carried. In addition, walking is a common mode of travel exercised by all villagers over short to medium-distances (i.e. up to about 20kms).

Iganga District

Table 46 shows that men predominantly use the shoulder, and to an extent the hand and head, whilst women mainly use the head, followed by the back and then hand. Shoulder loading is primarily used for carrying the bulkiest loads – production equipment, building materials and crops. The hand is used as a secondary mode when the shoulder is being used, typically to carry water in jerry cans, or smaller crop loads. Loads are gender proscribed, with the main loads carried by women including water and firewood on their heads, and babies or small children on their backs. The porterage of crops is both a male and female activity.

Table 46: Human Loading Used in Iganga District Last Year

Sub-county	Means of transport	Men	Women
Makuutu	Walking	100%	100%
	Shoulder loading	47%	23%
	Head loading	45%	95%
	Hand loading	66%	68%
	Back loading	4%	55%
Bukanga	Walking	100%	100%
	Shoulder loading	65%	0%
	Head loading	62%	100%
	Hand loading	54%	27%
	Back loading	23%	64%
Ivukula	Walking	100%	100%
	Shoulder loading	83%	53%
	Head loading	87%	79%
	Hand loading	74%	44%
	Back loading	22%	56%

Source: PRA group exercises

The percentage of women using their primary form of human porterage – head-loading – is considerably higher than the equivalent for men – shoulder-loading. Across the District, 91% of women have head-loaded in the past year, in comparison with 65% of men who have shoulder-loaded. Both the differing nature of the loads, and the percentage of people who have used them, provides an insight in the frequency of use. Women, who typically collect water and firewood, carry crops, and by necessity, young children, are more mobile than men, who carry production and construction materials and crops.

Kasese District

People carrying loads using only their own person, human porterage, is the most common mode of transport utilised in Kasese District. Various forms of human porterage were identified by members of the study villages; shoulder, head, hand and

back loading. Each serves a different or overlapping purpose depending on the size and nature of the load, and the number of loads carried. No disaggregation of forms of human porterage (nor sex) was made in Nyakiyumbu, the first in which the PRA was conducted.

Table 47: Human Loading Used Last Year in Kasese District

Sub-county	Form of human loading	Men	Women
Nyakiyumbu	Walking	100%	100%
	Back loading	96%	96%
Kyabarungira	Walking	100%	100%
	Back loading	100%	80%
	Shoulder loading	36%	0%
	Head loading	95%	80%
	Front Loading	5%	47%
	Hand loading	41%	80%
Mahango	Walking	100%	100%
	Back loading	85%	100%
	Shoulder loading	76%	0%
	Head loading	100%	83%
	Front Loading	28%	21%
	Hand loading	0%	96%

Source: PRA group exercises, Nyakiyumbu data was not collected in a disaggregated (female / male) form.

The results in Table 47 show that the back and head are the main forms of human porterage used by both men and women. Back loading is primarily used for carrying the bulkiest loads – production equipment, building materials and crops. The head is used for more awkwardly shaped items (e.g. timber poles, reeds, Matoke) and for baskets of goods (e.g. tomatoes and fruits). Almost all men, and a slightly smaller percentage of women have used this form of carriage during the past year. Whilst this in unsurprising, the nature of the goods being transported (crops, production materials and children) and the distances travelled would be alleviated by access to intermediate and motorised transportation.

Slight differences were found between the sub-counties, with the shoulder used more by men in Mahango than in Kyabarungira, and the opposite being true for the hand. There are no obvious reasons for why this might be so (both farm bulky crops), thus it may be a difference in the cultural norms built up over time. Difference between men and women are starker, with hand loading being far more common amongst women than men. This may reflect the larger burden typically experienced by women in terms of porterage: the use of the hand as a secondary or tertiary means to transport goods when the back and head is already being used. The hand was found to be typically used for the carriage of water in jerry cans, or smaller crop loads.

More broadly, loads are gender proscribed, with the main loads carried by women including water and firewood on their heads, and babies or small children on their backs. The porterage of crops is both a male and female activity. To exemplify this, Figure 48 illustrates the work patterns of women in one village, Kaswa II, Kyabarungira Sub-county.

Table 48. Female activity profile in Kaswa II, Kyabarungira Sub-County

Activity/ Location	How travel/ transport?	How often to you go there? How long does it take?
Irish potatoes – taken to Kitswamba	Foot/ Head	Once per week (Wednesday). 12 hours (leaving at 7am). Each basket sells at UgSh1,000/= (small quantity)
Fish – taken to Kitswamba	Foot/ Back	Once per week (Wed) – take Irish potatoes and bring back fish. 12 hours (leaving at 7am). Buy dried fish (usually around 20-30 at UgSh100/= each). On a load worth 5000S, make a profit of UgSh1000/=
Tomatoes - taken to Kitswamba	Foot/ Head	Sell within the trading centre. Big basin sold at Sh3000 and small basin at UgSh1500/=.
Water – collect from the river	Back	5 jerry cans daily for a family of 8 children. Takes between ½ hour and 6 hours.
Firewood – collect from the park/ reserve (were collecting from the valley- but has been depleted)	Back/ head	Two times per week. Takes 12 hours (leaving at 7am).
Food/ fruits from the mountain e.g. passion fruit	Back/ head	Two days minimum (in between firewood and some sales).
Health care. Take children to Kabatunda and Bwassande hospitals	Back	July is the month when child sickness is at its greatest – dry season. It takes about 4 hours to the health centre.

In this example, all of the movement is conducted by foot, carrying the goods and/or children. The profile illustrates the variety of tasks conducted by women over different time periods; water is collected daily, firewood is collected twice per week, Irish potatoes are sold once per week (during the season), and the children are often sick during July which involves trips to the health centres. The majority of the trip takes part or all of a day to accomplish on foot. This illustrates the need for other forms of transportation to reduce the time and energy burden placed on women, freeing them up to conduct other productive activities (such as spending more time in the fields and/or resting).

Katakwi District

Table 49 indicates the different forms of human porterage used in Katakwi District during the 12 months prior to the PRA (i.e. October 2001 – September 2002), and the extent to which they were used by both men and women. As in the other two Districts, human loading (i.e. on head, hand, back, and shoulder) is also the most common form of transport used by villagers over short to medium distances in Katakwi District. Equally, considering both domestic and income related transport tasks, women carry the bulk of the burden with head loading predominating.

Table 49: Human Loading Used Last Year in Katakwi District

Sub-county	Form of human loading	Men	Women
Asamuk	Head loading	79%	100%
	Hand loading	55%	67%
	Back loading	52%	44%
	Shoulder loading	63%	72%
Orungo	Head loading	70%	90%
	Hand loading	81%	82%
	Back loading	30%	82%
	Shoulder loading	61%	9%
Kapujan	Head loading	71%	81%
	Hand loading	90%	100%
	Back loading	48%	88%
	Shoulder loading	95%	88%

Source: PRA group exercises

Engineering and Ergonomics Aspects of IMTs

Domestic tasks & Agricultural tasks. According to the project's ergonomics expert, the most pressing transport need in Katakwi is for carrying water. Almost equally pressing until recently was the need to take grain for grinding but this seems to be less of a concern now that there are more locally operated commercial milling enterprises. This, in effect, reduces the distances that people (women) have to carry the grain. Women apparently dislike having to grind their own grain to the extent that they prefer to sell their labour for weeding and then pay commercial rates at the mill.

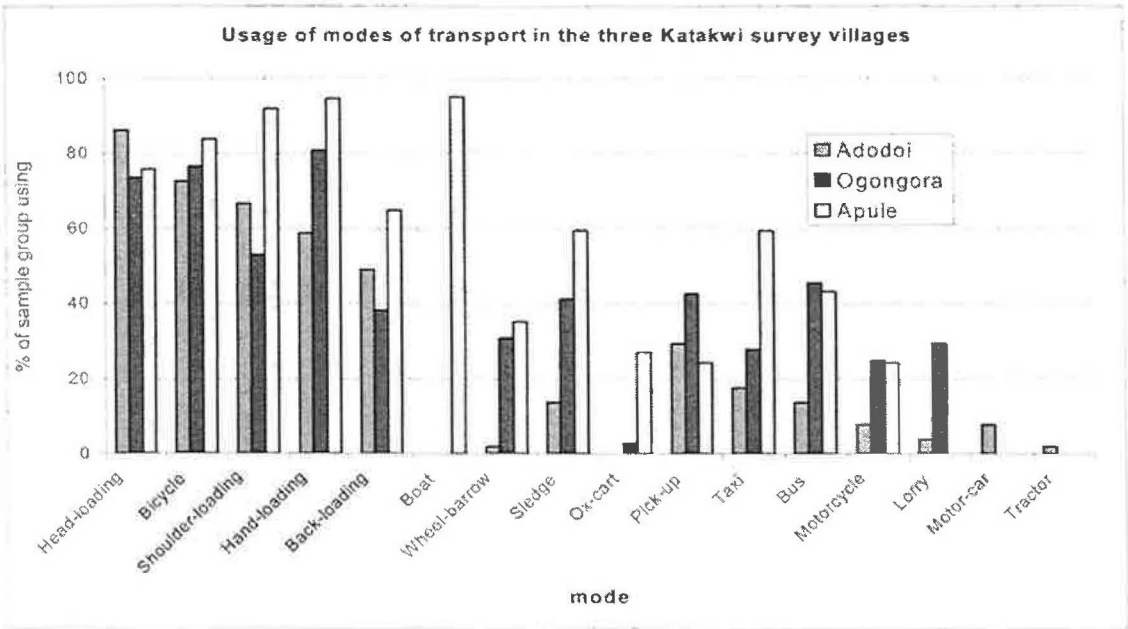
The predominance of human porterage in the villages surveyed implies that this would be the main mode of transport for water-carriage. Although the commonest mode of transport around Kapujan is by boat, the group said that they still had to use head loading for part of the journey. Similarly, in other villages some use is made of bicycles, but it would seem that head loading predominates (especially for women).

In the towns, fetching water by handcart was observed but this practice had not spread to the rural areas. One of reasons for this could be lack of access to credit to buy the means of transport. There may be some scope for investigating the use of handcarts, particularly for fetching water, in the rural areas.

Food is brought from the gardens daily (except Sunday) by head loading and hand loading. The time taken for this activity varies between about 30 minutes to two hours, depending on the distance between the homestead and the garden.

Human-powered transport (including rowing) heavily outweighed animal- and engine-powered transport. Combining the results from the respondents in all three sub-counties of Katakwi District, all forms of human-powered transport represented 59% of the total whereas the animal-powered modes represented 24% and engine-powered only 19%. Figure 24 shows the results combined for all 3 surveyed sub-counties, ranked with the most common mode to the left.

Figure 24:



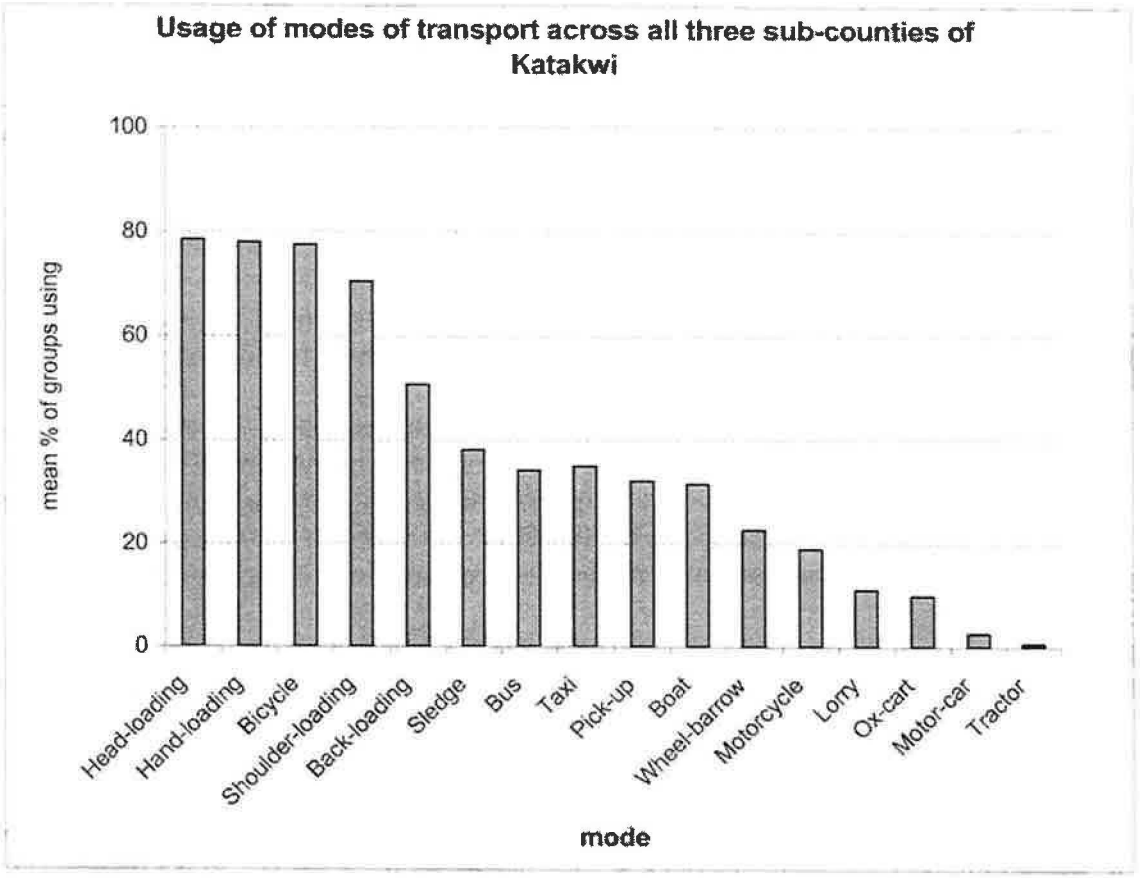

Usage of modes of transport across all three sub-counties of Katakwi
mean % of groups using
100
80
60
40
20
0
Head-loading
Hand-loading
Bicycle
Shoulder-loading
Back-loading
Sledge
Bus
Taxi
Pick-up
Boat
Wheel-barrow
Motorcycle
Lorry
Ox-cart
Motor-car
Tractor
mode

Figure 25

Overview of Transport According to Purpose

This section is primarily based on results from the household questionnaire survey (Tables A14 – A27 in Appendix 3). The first part of the section describes the modes of transport used for moving crops from the field and from there to the markets. This will be followed by an overview of domestic and service transport modes encountered in the villages.

Transportation of crops to the home / store[35]

Transportation of crops to the home primarily takes place on foot (i.e. human loading), with only some farmers in Iganga District using bicycles for the transport of specific crops (e.g. 32% of coffee growers, 21% of maize growers, and 61% of the (few) rice growers). Only very few households reported other modes of transport such as wheelbarrows, bicycle trailers, and lorries in Iganga. Ox-cart use was not reported by Iganga villagers surveyed.

In Kasese District, crop transport to the home or store is almost exclusively undertaken on foot. Bicycles are only used in rare cases (e.g. 9% of cotton growers, 5% of maize growers) mostly referring to the flat areas in Nyakiyumbu sub-county. Wheelbarrows, bicycle trailers, ox-carts, or lorries were not used by the households surveyed in this District.

In Katakwi District, the transportation of crops from the field to the home is equally mostly by human porterage. Bicycles, wheelbarrows, and ox-carts are only used in a limited number of cases.

Transport of crops from the farm to the market

In Iganga District, almost all the farmers who bring their crop to the village market would use a bicycle, although it needs to be borne in mind that according to the survey the majority of them currently sell at the farmgate (roughly 60 – 100% of those who sell, depending on the crop). Almost all the farmers in Kasese would use human porterage to reach village markets, whereas the system is more diversified in Katakwi District in that human loading, bicycles, and to some extent lorries would be used.

It has already been indicated that only a few farmers would transport their crops to the District market. The means of transport to do this would include mostly human porterage in Kasese, and a mix of means in Iganga District (i.e. bicycles, pick-up truck, lorry, and mini-bus). The very few farmers who transport maize to the market in Katakwi town would use a bicycle. According to the household survey, no other crop was sold by the farmers of Katakwi at the District market.

[35] In the overwhelming majority of cases, farmers store their produce at home. Only in some exceptional cases (e.g. cotton in Kasese) is the produce brought to a store or depot of a co-operative society.

Transport use for other IGAs

According to the questionnaire survey, the modes of transport used by villagers for other income generating activities (IGAs) such as trade, crafts, or processing of primary produce is also mainly by bicycle or on foot (Appendix 3). Whereas more of the Iganga villagers would use bicycles, the reverse is true for Kasese District. In Katakwi, which had by far the highest number of respondents indicating they had IGAs other than farming, walking and human loading also dominate although more respondents indicated the use of bicycles (11% - 31%, and 80% of the few that undertake waged or salaried work).

Transport use for domestic and service purposes

Transport use for domestic and service purposes is mainly dependent on human porterage and walking in that wood collection, which is considered a women's task, exclusively takes place on foot. Walking is also mostly used for water collection and purchasing of consumer goods. Bicycles are only used to some extent in Iganga for water carriage and for shopping in both Katakwi and Iganga District (i.e. about 30%). Walking would be the dominant mode of transport for the overwhelming majority of Kasese villagers undertaking these tasks.

According to the questionnaire survey, transport use to obtain services such as health care and education shows a mixed picture, in that walking is the only mode to go to school, and, depending on the location, walking and bicycles are used to visit health care facilities. In Kasese District, walking is the principal mode of transport to reach health facilities, whereas 85% of Iganga villagers and 35% of Katakwi villagers would use a bicycle. As for transport for social reasons, the picture is similar to that of transport for health reasons. In all three Districts, very few farmers would use motorised means of transport for health or social reasons according to the questionnaire survey (Figure 27).

Regarding the average time per trip, the survey clearly reveals that villagers in Kasese District spend much more time for transport purposes than their colleagues in Iganga or Katakwi District. For example the average return trip time to fetch water is 118 minutes in Kasese compared to 53 minutes in Iganga and 41 minutes in Katakwi. The fact that the Kasese villagers also indicated fewer trips per day (i.e. 1.2) compared to 2.5 and 2.1 in Iganga and Katakwi respectively, indicates that they are likely to have less water available for domestic purposes. Similar results have been obtained for other domestic transport uses and for the transport of crops from the field to the home and from there to the village market, as is highlighted in Figure 26.

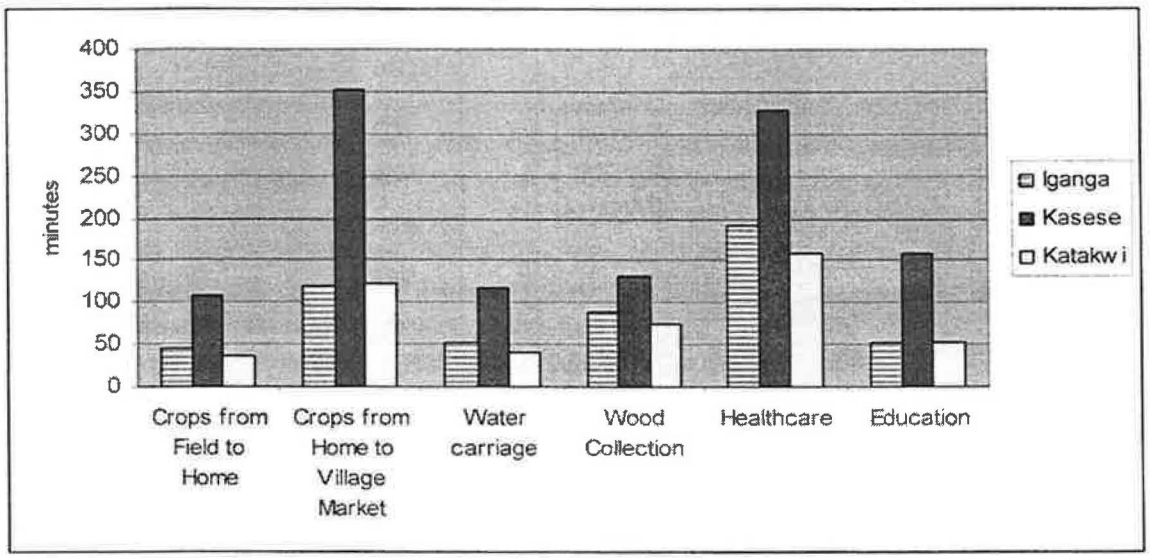
As for other means of transport such as bicycles, differences in the average trip time are less pronounced, although it needs to be borne in mind that owing to the hilly terrain the Kasese villagers depend much more on walking and human porterage. Transport of crops by bicycle is not always faster than transport on foot due to the fact that it is often used to transport heavier loads rather than for speed.

Table 50: Transportation Time and Cost for Crops from Store to Market

District		To Village Market			To district market				
		Foot	Bicycle	Lorry	Foot	Bicycle	Pick-up	Lorry	Taxi
Iganga	Time	120	173	-	-	198	320	384	780
	Cost	-	-	-	-	-	6,000	1,625	6,250
Kasese	Time	352	207	-	325	-	105	-	-
	Cost	2,000	2,800	-	-	-	5,150	-	-
Katakwi	Time	123	78	99	-	180	-	-	-
	Cost	-	2,750	2,231	-	3,000	-	-	-

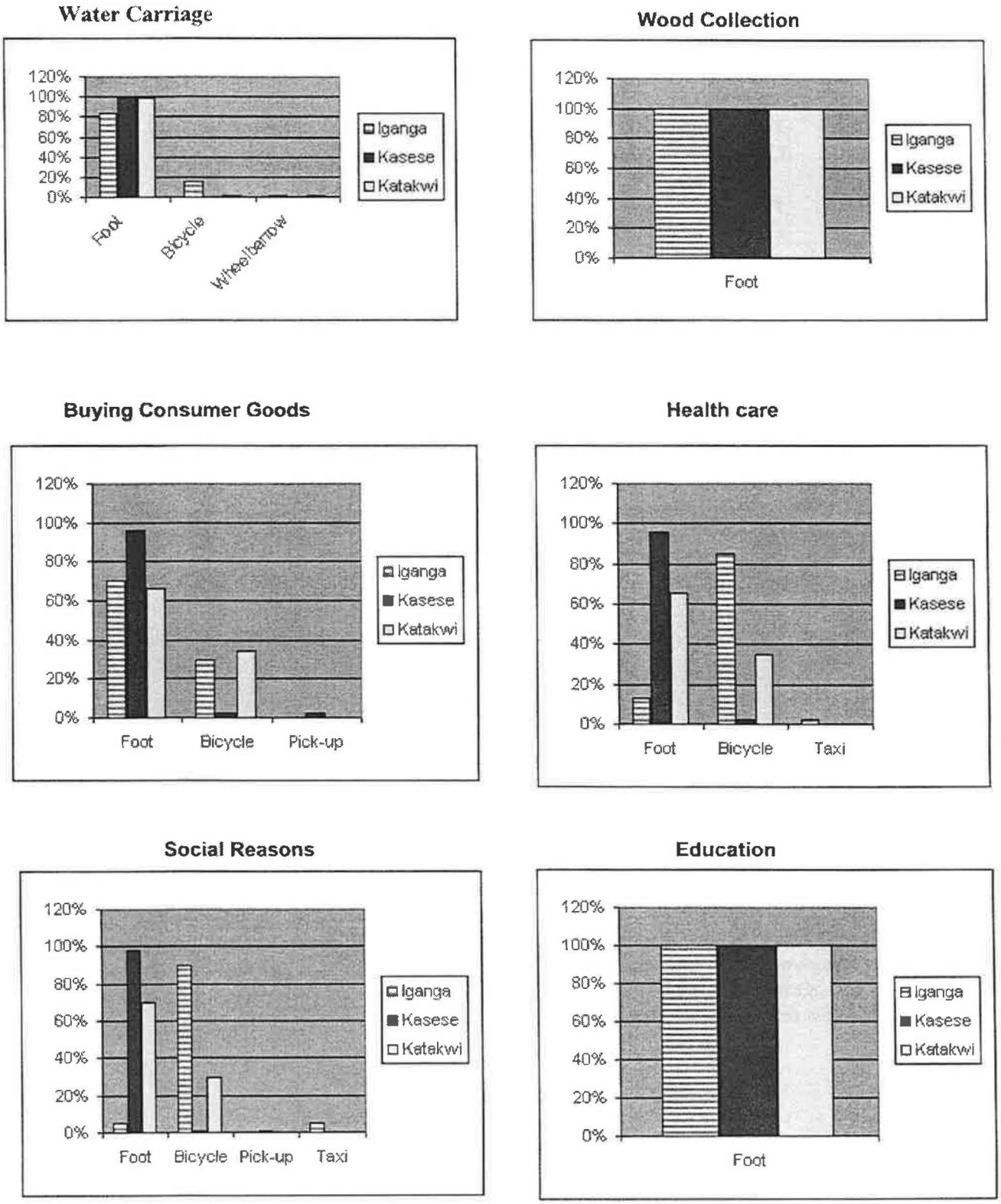
Source: Household questionnaire survey
NB. (1) Time in minutes. Cost in Shillings
NB (2) No estimates of weight were made
NB (3) Data on these indices were few, thus the responses should be treated with caution

Figure 26: Average Trip Time Using Foot as Main Mode of Transport



NB: (1) The trips for transport of crops from the field to the home store and from the home to the village market refer to one-way trips. Also, relatively few farmers replied to the question on crop transport time. (2) The trips for water carriage, wood collection, health care and education refer to return trips.

Figure 27: Domestic and Service Transport Use



NB: The interviewees were asked for the most used mode of transport for domestic and service purposes.

Transport System Summary

Iganga District

A number of patterns can be discerned from the findings of male and female transport use across the study areas in Iganga District:

Variable access to, and utilisation of transportation found across the study area confirms the access criterion that facilitated sub-county selection

Three sub-counties were selected for investigation in the study on the basis of a strong agricultural base, differing farming systems and variable accessibility. Three villages were selected as representative of these sub-counties. The findings of the study sub-counties broadly confirm this selection, ranging from the remotest, Makuutu with the lowest percentage of utilisation of motorised and intermediate means of transportation, to Bukanga with the highest utilisation.

Access to, and the utilisation of motorised means of transportation is poor; and when these modes are used, the reason is primarily human carriage, not the transportation of goods. Few forms of motorised or intermediate means of transportation are accessible to rural dwellers. Amongst the motorised means, two modes predominate: minibuses and motorcycles. Both of these modes are primarily used for human carriage, rather than the transportation of goods. The majority of rural dwellers transport very little produce, with between 2-14% men and women having utilised a pick-up, lorry or tractor over the last year.

Intermediate Means of Transport are limited to the bicycle

Amongst the intermediate means of transportation, one mode dominates: the bicycle. Similarly, the primary use of this mode is human carriage, although small quantities of goods are also transported. The utilisation of the bicycle is considerably higher than for motorised forms, three quarters of men and women having used a bicycle in the last year. Bicycle ownership by households is also high at 84% on average for the three sub-counties.

Other than the bicycle, use of other IMTs is limited and negligible. Thus, a few village agents and external traders, who evacuate the produce using pick-ups or lorries, control the transportation of agricultural produce to local and more distant markets.

Gender proscribed roles affect the modes of transportation used, and their frequency of use

Male and female domestic and productive roles within the household influence patterns of transport use. A higher percentage of women were found to have used minibuses over the year preceding the study, reflecting the primary purpose of taking children to health clinics and hospitals. Motorcycle use was fairly equitable between men and women over the previous year. Whilst motorcycles were used for a variety of purposes, this longer-term view appears to reflect periodic petty trading, social visits or purchasing by both men and women in nearby urban centres.

Similarly, an equal percentage of men and women had used a bicycle over the preceding year, however use during the 24 hours prior to the study revealed a far higher percentage of men than women. Ownership, and thus utilisation is controlled by men, who were found to own 99% of bicycles for a variety of social and productive purposes. Women were found to have to negotiate access, thus tending to use bicycles less frequently and for more productive reasons (i.e. when they have a particularly heavy load, or a larger distance to travel).

Differing forms of human porterage reflect gender-specific tasks. Men tend to carry the bulkiest loads: production equipment and building materials (primarily using the shoulders), while women carry water and firewood (using the head) and children (using the back). These modes are primarily practical, but are also embedded in social norms, with certain modes not socially acceptable by men. On average, women were found to spend many more hours engaged in porterage than men, reflecting the variety of tasks conducted: domestic and productive.

Differential access to and use of transportation by men and women, alongside social norms of male ownership, will have implications for the forms and manner in which transportation is introduced to rural communities.

Kasese District

A number of patterns can be discerned from the findings of male and female transport use across the study area:

Perceived unviable transport services by the private sector, and the lack of public service has maintained the isolation of rural communities.

The terrain in Kasese district is the main barrier to improved access to markets. Despite increases in government investment in road infrastructure, two of the three study villages were found to be almost entirely without access to motorised transportation. In the absence of passable roads, and the lack of a public transport service, private sector operators represent the only source of motorised transport for villagers in these remote areas. However, few private operators felt that running even periodic trips to these villages was economically viable, due to the wear-and-tear on the vehicle, or to the fact that they do not have vehicles (4-wheel drive pick-ups) that can access these areas. From the community-side, few members felt that sufficient capital could be raised to hire such a vehicle, nor that the sales of the product being transported would enable a profit to be made having paid off the hire of the vehicle.

Without considerably improved and maintained roads, the majority of residents in the study villages felt that there is little likelihood of attracting private motorised transport agents.

Limited range of IMTs in use aside from the bicycle

Only three types of IMTs were identified across the study area. The bicycle, used reasonably extensively in Nyakiyumbu in the flat areas, to a limited extent in

Mahango, and rarely in Kyabarungira, are of limited use due to the steep terrain found across the district. Whilst they are used effectively in limited areas for the transportation of people and small loads, they do not present a solution to the need for transport produce from the fields located in the mountains to the markets.

Stretchers, used primarily for carrying the ill, were also used in one village for carrying sacks of produce. However, they are very limited in terms of distance, typically no more than 0.5 km. No traditional of pack animals was found in any of villages, with only a few members having had contact with donkeys once owned by a family in a neighbouring village. Where animals have been introduced in the past, they have come with limited training regarding their care and utilisation, leading to a belief that they are not a reliable form of transportation.

The implication of this limited exposure to IMTs is the need for a structured training and educational process if certain types are to be introduced. Donkeys, which would appear to be a potentially strong form of transportation in the mountains, have little history and a derisory image amongst many of the villages due to the ineffectiveness of projects that have aimed to introduce them in the past. Oxen were felt to be a possibility in the plains, but again there is no history of using these animals.

Katakwi District

The seven most common modes of transport in Katakwi are all depended on the application of human power (See Figure 25).

The only IMT that had been accepted by the communities was the bicycle. There is scope for both increasing the level of bicycle use and developing other bicycle-based means of transport (of which the communities were largely ignorant).

There is scope for the greater use of draught cattle if affordable, effective ox carts can be made available. Methods of achieving this should be investigated.

Given the abundant availability of donkeys in neighbouring Karamoja, there seems to be scope for the introduction of donkeys, for both carting and draught tillage operations, but particularly for pack transport. In fact, donkey traction may prove more sustainable than the ox traction that is susceptible to cattle rustling by the Karamajong.

The use of simple devices to assist human porterage should be investigated. Human porterage should not necessarily be promoted but it is clear that people's livelihoods will depend on it for many years to come. There seems to be scope for the wider use of wheelbarrows and handcarts in rural communities to help reduce the drudgery of human porterage (especially for women).

The capacity for production and maintenance of IMTs in Katakwi is very low. The rural population has very little knowledge of IMTs and the only organisation to show any interest is YWAM.

IMT Needs Expressed

Iganga District

Based on a review of the intermediate means of transportation known and used, an exercise was carried out in one village, Naitandu, to assess preferences. As Table 51 illustrates, the most popular suggestion was the bicycle with trailer, identified by both men and women as a potentially useful mode for transportation of larger volumes of goods over short-medium distances. The power tiller was identified by men as an equally useful mode, that can be used both for ploughing and transportation purposes, whilst women identified the ox cart for the same reasons. Bicycles and donkeys were identified as the least useful modes, reflecting existing knowledge and use of the bicycle, and a belief that donkeys would alleviate their transportation problems.

Table 51: IMT Preference in Naitandu Village

	Men	Women
Ox cart	3rd	1st=
Power tiller	1st=	3rd
Bicycle with trailer	1st=	1st=
Normal bicycle	4th=	
Donkey	4th=	

Kasese District

Informal discussions were held with key informants in each village over the types of transport currently used, known and heard of, with a view to identifying the most appropriate for potential introduction. The types suggested by the key informants reflected existing access, and the terrain in terms of what might be feasible to introduce.

In Kyabarungira, very few bicycles exist, with only 9% of men and no women having used one in the year prior to the study thus this was considered to be a first preference. However, it was recognised that the hilly terrain makes it difficult (and dangerous) to carry loads on bicycles. The project team inquired about the use of donkeys, but no residents were found who had experience of managing these animals. There was some knowledge of power tillers, and key informants stated that there were workshops in Kasese and Rugendabara (a nearby town) where repairs can be carried out repair.

In Mahango, the main means of transportation is also human porterage. The first access road to the village was completed in 1999, built by the district with community labour. However, this is only passable by four-wheel vehicles during the dry season. Attempts by the community to bring in transport operators have resulted in one-off trips by pick-ups, but no consistent arrangement has yet been organised. Regular access to motorised or intermediate means of transportation requires walking down the escarpment, where pick-ups, *bodaboda* bicycles and minibuses are available. Whilst bicycles were suggested as a transport need, it was recognised that these would only be used on the plains, and thus would not address the problem of travel and

transportation to and from the sub-county. An interest was expressed in using donkeys, although existing knowledge is limited[36].

Bicycles are common in Nyakiyumbu sub-county. Suggestions of transport needs in this context reflect the dual nature of the village, living part of the year in the mountains, and the remainder in the plains near the cotton fields. Some farmers considered that power tillers might be the solution for transporting consolidated crop loads over long distances to marketing centres. However, to be affordable, this would have to be owned by a group. Despite the cooperative arrangement for cotton marketing, group structures are rare due to a stated lack of trust amongst people. Oxen were suggested, but a number of the key informants felt that they lack the land for feeding them, particularly those who reside mainly in the hills. Tractors were deemed to be too expensive, whilst past experience with donkeys (in terms of transporting produce up and down from the hill) was found to be negative.

Katakwi District

Informal discussions were held with key informants in each village over the types of transport currently used, known and heard of, with a view to identifying the most appropriate for potential introduction. The types suggested by the key informants reflected existing access, and the terrain in terms of what might be feasible to introduce. Table 52 shows the male and female choices in the three sub-counties.

Table 52: Choice of IMTs by PRA participants in Katakwi District

Sub-county	Gender	Choice of IMTs		
		1st	2nd	3rd
Asamuk	Men	Ox-cart	-	-
	Female	Ox-cart	Bicycle	Bicycle-trailer
Orungo	Men	Bicycle-trailer	Ox-cart	Bicycle
	Female	Bicycle-trailer	Ox-cart	Bicycle
Kapujan	Men	Bicycle	Ox-cart	-
	Female	Ox-cart	Bicycle	-

In the PRA it was established that sledges are used in transporting produce from farm to homestead or market. This was supported by the household survey, which indicated that 9% of the households own oxen. Therefore, it is not surprising that the first choice of IMT for both men and women is ox-cart since the ox-cart is a better technology than the sledge and can carry heavier loads. However, cost of the cart will be the critical factor to its introduction, as many households may not be able to afford the price. Ox-carts are reportedly too expensive for the inhabitants to own even when the oxen are already available and un-utilized during off-peak agricultural seasons. YWAM located at Katakwi town, has designed relatively cheap experimental carts but no interest for adoption has been generated.

The bicycle-trailer is a first choice for Orungo sub-county. This may be so because only 2% of households in Orungo own oxen. In the last few years, residents have lost

[36] A few of the key informants had been exposed to a donkey owned by one couple in a neighbouring village. However, the animal died in the past year, they believe because it had been badly looked after.

their oxen through the LRA insurgency and cattle rustling by the Karamajong. This does not encourage them to choose ox-cart as their first choice. However, the tracks and paths, which are not sufficiently smooth, would be a hindrance to the introduction of a bicycle trailer.

Neighbouring Karamajong uses donkeys for transport and they are relatively cheap and could be barter traded for goats and grains but no one in Katakwi has picked up interest in using the donkeys. It was felt that ox-carts and donkey-carts would help meet transport needs but concern was expressed over the management of donkeys if there was not a good balance of male and female animals.

Household Travel and Transport Priorities

As part of the household questionnaire survey, the villagers were asked to indicate up to three transport priorities. The results reveal that households have a number of priorities, crop transport being only one amongst others. (For details see Tables A27 – A29, and Figures A3 – A5 in Appendix 3). As for the first priority, 24% of the villagers in Iganga District, 11% in Kasese District, and 56% in Katakwi District indicated that their first priority is transport of crops from the farm to the home / store. Regarding the transport of crops to the market, the replies were lower (i.e. 6% in Iganga, 14% in Kasese, and 6% in Katakwi). Interestingly, 63% of farmers in Kasese District highlighted the transport of agricultural inputs as their first priority. Other first priorities included, transport for other income generating activities (i.e. 14% in Iganga, 7% in Kasese, and 30% in Katakwi), social reasons, health related travel, and other reasons.

Kasese farmers' second priority was more dominated by crop transport requirements (32% transport from the farm to the home / store; 42% transport from the store to the market). Katakwi villagers indicated transport for other IGAs (36%), water (28%), crop transport to the home / store (18%), and fuelwood transport (13%) as their second priority. Iganga farmers highlighted travel for social reasons (36%) and for health reasons (32%) as their most pressing second priorities.

The third priority was dominated by crop transport at farm level in Iganga (41%) and Kasese (55%). Transport of water was the most pressing third priority of Katakwi villagers (40%).

Household Travel and Transport Problems

Villagers could give up to two answers to this question. Lack of available transport and high cost were the two top problems stated in the Districts. There were slight variations in that whilst Iganga and Kasese farmers highlighted lack of availability as their most pressing problem, it was high cost in the case of Katakwi. The reverse was the case for the second most important problem. Lack of safety, lack of speed, and 'other' problems received lower scores. Female and male responses were similar in all three Districts. (For details see Tables A30 – 31, and Figures A6 – A9 in Appendix 3).

TRANSPORT ECONOMICS ASPECTS OF IMTS

IMTs and Their Suitability in Agricultural Marketing

According to Hine and Ellis (2002), walking limits any increase in agricultural production. The effects of IMTs on agricultural production are many:

- Cultivation of bigger areas;
- Utilisation of more fertile, but remote, soils;
- Production of heavier corps;
- Increased utilisation of fertiliser and manure;
- Reduced pest damage and spoilage at crop harvest time;
- Reduction of transport time, partly used for income generation;
- Reduced effort and drudgery involved in human porterage; and
- Spill-over effects if animals are used for ploughing and transport.

Aspects to consider when improving transport in rural areas

It is widely recognised nowadays that the provision of roads is not enough to promote the movement of goods and lead to economic development. Hine and Ellis (2002) highlight other factors that policy makers should consider in parallel with transport investments:

- There are more benefits associated with developing basic vehicle access to areas of high agricultural potential than with increasing the quality of access to zones with already good vehicle access. Most benefits are obtained when people and goods shift to different means of transport.
- Final market prices are heavily influenced by transport costs, which affects the competitive advantage of developing countries.
- Marketing systems can be inefficient and suffer from monopolistic practices. This is a more widespread problem in Africa than in Asia. Even if farmers were allowed to transport the products themselves, they would not be able to reap the benefits of higher prices as other economic agents have enough market power to impose a price on farmers.
- The use of IMTs can significantly improve rural peoples marketing opportunities. This is because marketing of agricultural produce is often restricted by poor transport. Many reports show that harvests are rotting in the fields and at collection points due to a lack of transport to markets.
- The positioning and availability of markets has a large impact on the demand for transport services and the type of vehicle used. Agriculture is best served by consistent high urban and international demand, and this can be attained through an efficient, high volume, transport and marketing system.

Suitability of Intermediate Means of Transport

It is important to distinguish between markets that are within walking distance and those that are too far away to walk. Three to four hours of walking (one way 10-15 km) are often regarded as the threshold for access to markets (Hine and Ellis, 2002). A pack animal can extend the distance to 20 km in hilly areas, a bicycle to 30 km in flat terrain and a single axle tractor with trailer can cover up to 50 km. For longer distances motor vehicles are essential. General characteristics if IMTs are found in Table 53.

Table 53: General Characteristics of IMTs

Mode	Max load (kg)	Max speed (km/h)	Max range (km)	Terrain required
Wheelbarrow	100	5	10	Flat narrow path
Bicycle	75	20	20	Flat narrow path
Bicycle and trailer	200	10-15	15-20	Flat wide track
Bicycle and slider	150	10-15	15-20	Flat wide track
Pack animals	100-250	5	15-20	Hilly, narrow path
Animal-drawn sledge	200-400	5	10	Flat
Animal drawn cart	500-1500	5	15-20	Flat wide track
Motorcycle	100	40-90	100	Motorable path
Motorcycle and side-car	250-500	30-60	60	Flat
Motorcycle and trailer	250	30-60	60	Flat
Single-axle tractor and trailer	1500	15-20	40	Flat
Asian utility vehicle	1000	60	60	Motorable road/track

Source: Riverson and Carapetis (1991), quoted in Gebresenbet et al (1997)

Paul Starkey summarises the suitability of different Intermediate Means of Transport according to distance and geography, as follows:

- Hand-carts and wheelbarrows appear well suited to short distance transport in towns and around markets. Bicycles with simple carriers are very widely and increasingly used for personal transport and some load carrying. Ox-carts and donkey-carts, using automotive technologies (used vehicle axles), are increasingly used in the rural areas of Sub-Saharan Africa, particularly in semi-arid areas. Pack donkeys can have important local roles, assisting women and men, particularly in dry zones and hilly areas. To date, most carts and bicycles are owned and used by men. While there are a large number of technologies that can be used by rural women to transport domestic water, this common transport problem has yet to be adequately resolved.

- Motorised IMTs are common in Asia but have yet to be widely adopted in Africa. While there is a steady increase in motorcycles for personal transport, their present use affects only a small proportion of the population (with the notable exception of parts of Burkina Faso and neighbouring countries). Power tillers have yet to be widely used for rice production or transport. Trends from Asia suggest this technology may first be adopted in areas of irrigated rice production with high population densities, close to towns where motorised vehicles are widely used and maintained. The conditions for adoption of other motorised IMTs (motor tricycles,

auto-rickshaws) are most likely to be met in periurban areas, where there is economic demand and supporting infrastructure. (Starkey, 2002)

The uptake of IMTs is also heavily influenced by their costs and the possibility of increasing a household's income. In some cases, once credit is available, the potential to gain income may be the most important consideration, rather than actual costs. Also, increased mobility has social benefits as well as an economic value. Additionally, the adoption of IMTs in Sub-Saharan Africa is related to problems of availability and supply (Starkey, 2002). Users have a low purchasing power limiting their transport choices. The creation of improved supplies stimulates demand and leads to a more widespread adoption when the number of users reaches a critical mass. In some cases training artisans in workshops can overcome a shortage in supply. It is important to carry out regular objective evaluations to monitor progress and assess the suitability of measures to improve the uptake of IMTs. In some cases, corrective action can avert problems at an early stage. Pros and cons for bicycles, ox-carts and donkeys are presented in Table 54.

Table 54: Pros and cons for bicycles, ox-carts and donkeys

Bicycles

Pros	Cons
• Don't require fuel • Relatively fast • Cheap • Can be used on narrow paths • Local manufacturing and repair capacity exists in many countries • Bicycle trailers can be used for heavy or bulky loads, however this requires improved, wider paths/tracks. In the past, bicycle trailers have not been very successful.	• Often not used by women, owing to cultural attitudes, or lack of appropriate equipment (i.e. bikes without cross-bars) • Pay load is limited to about 100 kg • Difficult to use in hilly terrain, in particular if paths/tracks are not sufficiently smooth.

Oxcarts

Pros	Cons
• High pay-load (i.e. up to about 1000 kg) • Advantageous if animals are also used for ploughing • Cows can be used for transport (e.g. Southern Europe); as a result milk can be an additional benefit of the traction animal	• Mostly used by men • Pair of oxen plus a cart are fairly expensive and often beyond the reach of resource poor farmers • Animals have relatively high feed and fodder requirements which can be a problem in areas were farm sizes are small (i.e. below 2 hectares) • Problems with diseases such as tripanosomiasis in particular in the more humid part of Sub-Saharan Africa • Cattle rustling ca be problem

Donkeys

Pros	Cons
• Due to the animals' size, they can be used by women and even children • Relatively inexpensive • Can be used on foot-paths, in particular in hilly terrain where there are no roads or tracks which can be used by bikes • Require little management, in particular in arid or semi-arid regions • In some parts of Africa (e.g. Mali) there is widespread use of donkey-carts • Owing to their low value, theft of donkeys is rare compared to cattle rusting	• Donkeys survive best in arid or semi-arid regions. Disease prevalence and mortality rate increase if annual rainfall is above 700 – 1000 mm • If used as pack animals, carrying capacity is limited to about 70-100 kg

Source: Kleih et al (1999), based on personal communication, Paul Starkey

The Costs of IMTs

Vehicle operating costs were calculated by Paul Starkey, displaying the costs of different IMTs assuming various levels of utilisation. The analysis does not consider the effects of road roughness and geography.

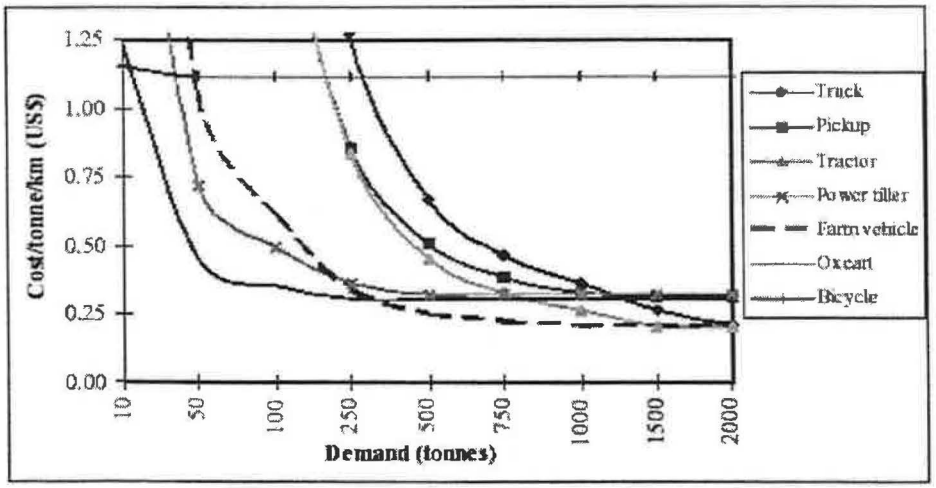
Figure 28 shows that a bicycle has lowest operating costs only at short distances (10 km or less) and where demand is low. Bicycles are quite suitable for rural transport, where small loads over short distances are involved on relatively flat to rolling terrain. Although costs for donkeys are not shown, donkeys are also a very cheap option at short distances and low levels of demand, and they can be used in hilly terrain. However, when annual transport surpasses about 10 tonnes then the ox-cart becomes the lowest cost option at short distances (i.e. up to an annual demand of 250 tonnes). Ox-carts can also be used for agricultural preparation, and carts can also be employed with other animals, such as cows, donkeys, mules, and horses. At much higher levels of demand (400 t or more per year), locally manufactured farm vehicles are the cheapest options at short distances.

Locally manufactured farm vehicles are basically motorised means of transport built with second hand car parts and cheap chassis, with some spares such as gear boxes imported from China. These vehicles are cheap to buy, easy to maintain, and because they are made locally, easy to replace. However, it requires local workshops and knowledge for maintenance. Unfortunately, the team did not find any of these vehicles in Uganda during the PRAs, and it is unlikely that there is local capacity to maintain such a vehicle.

At a distance of 50 km (Figure 29) oxcarts are the cheapest mode only if demand is lower than 50 tonnes per annum. Although ox-carts are slow, they can use almost all types of roads, are cheap to maintain, and local capacity for repairs is widely available in Uganda. At levels of demand in excess of 50 tonnes per year locally manufactured farm vehicles become the cheapest alternative at longer distances. Trucks are only competitive at very high levels of demand (around 1,000 tonnes/year). Tractors are often forgotten as means of rural transport, but they can be used for many tasks,

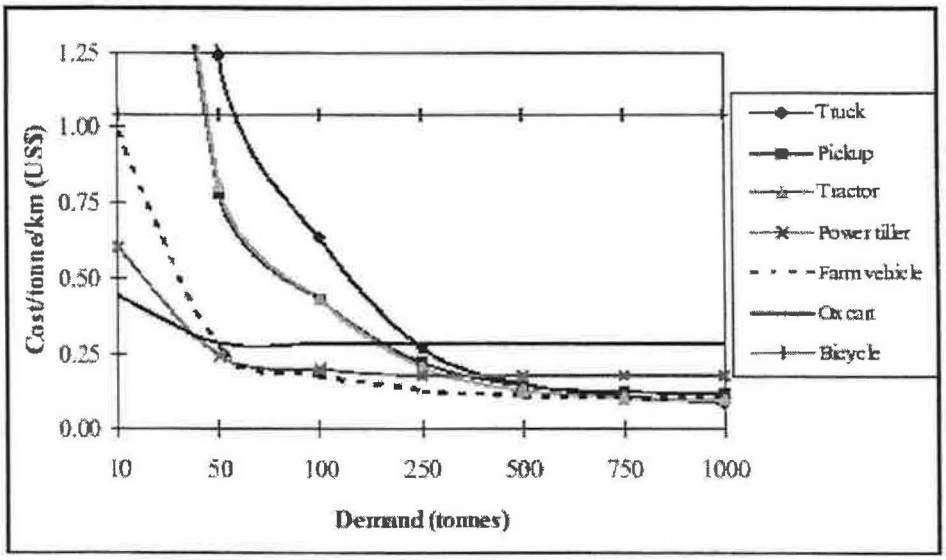
although operators may find it difficult to reach a high level of utilisation throughout the year because of seasonal demand.

Power tillers and trailers also perform quite well between 10 and 50 km, but are difficult to use in hard soils for ploughing. Unfortunately, it is only in irrigated areas or in areas of high rainfall where it is possible to obtain high levels of utilisation for power tillers, so they are not suitable for the Ugandan districts studied. Additionally local mechanical workshops are not familiar with this type of vehicle, so they would lack the experience and spares available for maintenance.



Source: Starkey (2002)

Figure 28: Vehicle operating costs assuming a 10 km distance and varying levels of demand



Source: Starkey (2002)

Figure 29: Vehicle operating costs assuming a 50 km distance and varying levels of demand

The above findings, which are based on international research, need to be seen in the context of Uganda and the project. Table 55 provides figures for capital costs of some Intermediate Means of Transportation in Uganda. Most farmers stated the high cost of IMTs as a major constraint for their acquisition. As a consequence, in particular if the less well-off are to benefit from the project, it appears pertinent to consider targeting groups as an entry point for testing the IMTs.

Table 55: Capital Costs of Selected IMTs in Uganda

Means of Transportation	Capital Costs (USh)
Wheelbarrow	Approx. 40,000
Bicycle (new)	Approx. 100,000
Bicycle (used)	30,000 – 60,000
Donkey	80,000 – 100,000
Donkey-cart	200,000 – 300,000
Oxen	300,000 – 350,000
Ox-cart	250,000 – 700,000

Source: PRA, 2002

'Pay-back period' is one of several indicators to assess the financial viability of an IMT and indeed of any enterprise. Considering the success bicycle use has enjoyed through *boda boda* over the last decade in Uganda, the financial viability of this IMT must be positive in that owners are able to recover their original investment within a relatively short period of time. For example, if a bicycle owner is able to make enough rides to earn USh2,000 net per day would mean that the investment cost of USh100,000 is recovered within 50 working days.

Donkeys cost approximately the same amount as bicycles. As a result, it can be envisaged that they can be quite profitable in areas where they do not have to compete with other IMTs or motorised transport. In particular, in the mountains of Kasese District there appears to be no other option than animal transport under current conditions.

As for the use of carts, these require relatively larger loads to be transported. Given its production potential and the amount of crops marketed, Iganga District seems to be well suited to test the viability of ox-carts. Nevertheless, it needs to be borne in mind that a pair of oxen plus a cart cost approximately USh 1 million. This indicates the need for heavy utilisation of this means of transport if it is to be profitable for a farmer or a farmers' group for that matter. Assuming that a cart owner can earn USh 10,000 net per day would mean that this means of transportation would have to be used at least on 100 working days to recover the original investment cost. This rate of utilisation seems possible over a period of one to two years, however the loads to be transported will not only have to consist of farm produce but all loads to be encountered in a village (e.g. manure, building material, water, etc). Due to seasonal fluctuations in demand, transport for agricultural marketing alone is unlikely to allow the IMT to be profitable.

Katakwi District represents an interesting case in that agricultural surplus production is comparatively low but villagers are already used to draught animal power. Where farmers own them, oxen are currently mostly used for ploughing. A limited number

of ox-carts exist in the District however it appears there is scope for design improvements and farmers consider the purchase of new carts beyond their financial reach. The fact that rural communities in Katakwi also rely on other income generating activities in addition to farming, is likely to create demand for transport services. Given that cattle rustling still prevails in parts of the district may make the introduction of donkeys and donkey carts also an interesting option.

In sum, IMTs have to be used for as many purposes as possible to maximise their profitability. Potential uses of the IMTs to be tested ought to include crop transport, as well as transport for other IGAs and domestic reasons. If they are used for unpaid household purposes (e.g. water carriage) then this ought to be seen in the context of opportunity costs and the savings thereby made in monetary terms or otherwise. Details of the costs and benefits of the IMTs form an import part of the action research planned for phase II of the project.

THE RURAL TRANSPORT INFRASTRUCTURE

The Road Network

The design standard and the condition of the road infrastructure are key in terms of all-year access for communities. Earth feeder roads, which are easily rendered impassible in the rainy seasons, mainly traverse the three districts with drainage structures at river crossings. These roads are suitable for IMTs and motorized vehicles not heavier than light (4-tonne) trucks. However, in some cases heavier vehicles transporting produce or building materials use these roads damaging the running surfaces severely and in most cases damaging the drainage structures and thereby cutting off community access.

Kasese District having a mountainous terrain has very poor road access compared to the other two districts that are relatively flat. Even the few roads that have been built deteriorate very fast due to fast flowing runoff that causes soil erosion. One of the three research sub-counties, Kyabarungira, could not be reached by motorized transport as the road was still under construction. Nyakiyumbu sub-county is traversed with a trunk road with community earth roads joining it at several points. However, the black volcanic soil renders these roads impassible when wet and yet the gradients are very steep due to the mountainous terrain.

In Iganga district, without exception, the direct access routes leading into each of the study villages is a community maintained road. In each case, the distance from the village to the nearest district maintained feeder road is approximately 2-3 km, where the standard of the road and its maintenance is considerably higher. All the sub-county headquarters are accessed by a feeder road. At the time of the PRAs, before the September-December rains, the roads were still in good condition.

Katakwi District is relatively flat with many rivers and swamps. All the headquarters of three sub-counties are connected to an all-weather road. However, the villages are connected by community tracks. Almost all the district roads that were seen require re-grading. There are also trouble spots where too much water has washed away the banks of the roads.

Recommended Road Maintenance Procedures For All Year Access

Almost all roads in the three districts are unsealed, built on top of tropical soils which deteriorate very quickly as it rains frequently. This means that maintenance is a top priority, and the teams in charge of road maintenance should concentrate their efforts on priorities for the maintenance of unsealed roads given in Table 56.

Table 56: Priorities for the Maintenance of Unsealed Roads

Season	Priority	Activity
Before rains	1	Clean culvert inlets and outlets
	2	Clean mitre drains (off-shoots)
	3	Clean side drains and catch water drains
Rainy season	1	Inspection and removal of obstacles
	2	Clean culvert inlets and outlets
	3	Clean side drains and catch water drains
	4	Clean mitre drains (off-shoots)
	5	Repair scour checks and side drain erosion
End of rains	1	Repair erosion galleys on shoulder, side drains, etc.
	2	Fill potholes and minor galleys in the carriageway
	3	Grub edge and reshape carriageway
	4	Cut grass in the side drains
Dry season	1	Fill potholes and minor galleys in the carriageway
	2	Grub edge and reshape carriageway
	3	Clear bushes and shrubs
	4	Cut grass in the side drains

Taken from Dennis (2002)

These maintenance procedures should be complemented with the normal processes of re-grading and replacing lost material on the unsealed roads.

Crossings over Streams and Rivers

Throughout the visual inspection of the three districts, it quickly emerged that all access roads have crossings over streams and flows of water that are suitable for IMTs and pedestrians. However, they are some crossings over streams in Kasese District that will not be able to support vehicles, and once there is road access, some vehicles would use the roads, as there are some schools and hospitals being built in the area. For this reason, locals should be trained in appropriate technology to repair or rebuild bridges damaged by heavy vehicles.

Table 57 gives structures that are suitable for stream crossings, dips in the footpath alignment and on sloping ground to transfer water from the high side of the path.

Table 57: Structures Suitable for Stream Crossings, Dips in Footpaths and Sloping Ground

Cross Drainage Option	Suitability
Culverts	Low to medium flows of water. Suitable for all types of footpath users
Drifts	Suited for wheeled vehicles to cross shallow streams, with depth up to about 30 cm.

Source: Dennis (2002)

Other water crossing structures used throughout the developing world, such as cross drains and stepping stones, are not suitable for wheeled vehicles.

In the case of rivers, and more complex crossings with spans of less than 15 metres, simple technology can be used to build bridges using logs and sawn timber, widely available in the region.

On top of the technical assistance, teams should build a clear picture of the local capacity available in the region, and who is responsible for maintaining roads. The villagers interviewed were adamant that the government was responsible for all road maintenance, even though community members themselves with their own money and labour have built some of them in the past.

Tracks & Footpaths

Paths connect most homesteads in the surveyed sub-counties but they are in poor condition. Heavy rain causes potholes and erosion to develop and the paths may flood and become impassable. No maintenance or path repair is undertaken. Rural communities should be introduced to the benefits of, and simple methods for, improving local tracks and paths.

INSTITUTIONS AND SUPPORT SERVICES

This part of the research was conducted through semi-structured interviews with a cross-section of service providers mainly located in the district capitals. These included the district government office, non-governmental training associations, micro-credit companies, agricultural co-operative and transport enterprises. The purpose of this rapid institutional assessment was to gain an understanding of the context within which support is being provided to rural dwellers, and to look for specific entry points in linking farmers with relevant public and private enterprises.

Iganga District

Government agricultural services. Public sector support for rural development in Uganda is under considerable change under the auspices of the Plan for Modernisation of Agriculture (PMA). The newly formed National Agricultural Advisory Service (NAADS) is being introduced into a pilot sample of districts as a replacement for the national extension service as quasi-private entity to provide extension services to clients. Iganga District currently has a cadre of 100 agricultural extensionists including vets. These are based at the sub-county level at an average of 4 per sub-county. The introduction of NAADS has yet to impact directly on the public extension network in Iganga, but is likely to affect the reach and number of extensionists working in the district in the future.

NGO-supported introduction of oxen and ox-ploughs. The Multi-Purpose Training and Community Empowerment Association (MTCEA) is an Iganga-based NGO that provides support to rural dwellers in the district in the areas of sustainable agriculture through training, community empowerment and adult literacy. A link is drawn between the latter two components, with adult literacy identified as a pre-requisite for the rural populous to improve their ability to demand services. The majority of MTCEAs work is focused on three sub-counties: Nakigo, Bulamagi and Ibulanku.

In terms of improving agricultural marketing, MTCEA has supported community groups in the purchasing of ox ploughs, and training in use and basic maintenance. Two groups with which MTCEA provide support in sustainable agriculture expressed an interest in purchasing oxen and ploughs. These groups were composed of young men who were willing to invest in this particular technology, despite no prior experience.

MTCEA acted as an intermediary between Sasakawa Global (SG) 2000 and community groups with which they work (in Nakigo and Ibulanku sub-counties) in the purchase of 15 ox-ploughs. SG 2000, an NGO, supplied the ploughs, and MTCEA acted as a guarantor to the two groups of between 15-25 members.

Oxen cost USh200,000 - 300,000 each- and four are required for ploughing. The ploughs cost USh235,500 each. SG 2000 requested an initial deposit of USh70,500, followed by instalments over four agricultural seasons. Apart from SG 2000 provided ploughs (which are imported), local ploughs are purchased and used locally (made in Tororo and Jinja).

Reflecting on the relative value of the ploughs available to rural dwellers in Iganga, MTCEA noted that whilst the SG 2000 provided ploughs are multi-purpose (can also weed) – they were also felt to be slightly inappropriate for two reasons. Firstly, the SG 2000 ploughs are heavy, and when combined with the thickness of the soil in the district are difficult for oxen to pull. Four oxen are thus required for the ploughs to be used effectively. Secondly, spare parts are not available locally, but need to be imported through SG 2000. This has both cost and time implications. Both the oxen requirement and the cost and time lag in obtaining parts is restricting local rural demand for SG 2000 ploughs.

Few ox carts are used or available in the district, with MTCEA staff citing the nearest known example in Burseke County, 33 kilometres from Iganga Town. Nevertheless, it was felt that demand for transportation is high, particularly as rural labour is increasingly being constrained by the introduction of UPE, with the majority of children now attending school.

Finance for rural enterprise. Few non-governmental or private sources of finance exist for rural-based loans in Iganga District. PRIDE – Promotion of Rural Initiatives and Development Enterprises Ltd – is one of these, operating across Uganda. Started as an NGO with NORAD support in 1996, it has become a limited company with a mandate to provides loans for small enterprises and trading for those who can provide evidence of existing business activity. The relevance of PRIDE to support for improving crop marketing appears through loans provided to *boda boda* operators, and to crop traders. However, and despite its name, the majority of loans are provided to urban and peri-urban groups, and it was suggested that loans for purchasing intermediate technologies are unlikely to be granted unless they are requisites of an existing enterprise.

Crop storage and marketing support. The Nakisenhe Adult Literacy Group (NALG), initiated in 1993 as a youth association focusing on literacy, linked up with the ACDI-IDEA project in 1998 to support farmer-group formation, rehabilitate agricultural stores, provide market information to farmers and help facilitate collective sale.

NALG run 16 stores in the district[37], former co-operative stores that have been rehabilitated. The stores collect only maize[38] from local farmers groups (mainly larger farmers – biggest with 50 acres, average size 5+ acres, but also some smaller ones) – with groups of 36-42 farmers located near to each store. The farmers bring their maize to the store and receive certificates for the amount brought (kgs/MT), a marginal price and stating the length of expected storage prior to sale. Farmers authorise sale to the store manager (himself selected by the farmer's group) under these conditions. NALG manage the stores (through their managers) and provide market information on a weekly basis in connection with IITA. They are not involved directly in the buying or the selling, but look for markets and then pass the

[37] The following sub-counties in Iganga: Ibulanku, Nakigo, Bulange, Wanbuga, Bukanga, Bulconsa; and in 2 s/counties in Kamuli District: Bukanya and Namwiwa; and in Mayuge District (Buwaya s/c) and Bugiri District (Nabukaki, Bugiri Town).

[38] The aim of NALG is to expand the number of stores (4 more are proposed at the moment) and the crop range into groundnuts, beans and banana.

information on to farmers who choose when to release their maize from the store (either at the best price, or when they need to sell). NALG noted that farmers typically make a 25-30% premium as on selling to traders at the farm gate. The main purchasers are the WFP (which has large stores located in Tororo) and export buyers based in Kampala and Kenya.

When the NALG began the co-operative system they had trouble convincing people of the value of the stores – and only stored 3MT in total. Now they are storing up to 450MT per season across the 16 stores (during the main harvesting season). The average storage time is 4 to 5 months. However, it is common that farmers need to sell some of their produce early due to cash needs. In these cases, either NALG provide market information (which is done on a weekly basis anyway) – and buyers are contacted. Cash is then passed on to the farmers. Alternatively, another farmer who has produce in the store- and has cash available- will purchase the maize from the farmer who needs to sell – gives the cash to the farmer- and adds the extra maize to his tally.

Transportation was identified as a crucial issue for farmers – both for the transport of inputs and the movement of produce to the stores before it spoils. NALG found that the larger farmers using inputs were constrained by their lack of transport in travelling to input supply shops and transporting the inputs back to the farm. In the majority of cases, farmer wait for shops to supply them at the farm gate. This was often found to be uncoordinated with the agricultural timetable, with suppliers arriving late, forcing farmers to delay input application, or to find other sources for inputs. NALG staff were aware of two cases of farmers currently using oxen and carts for transporting agricultural produce, both based in Bugiri District[39].

Transport associations and workshop services. The Ntinda Micro-Enterprise Association formed a *boda boda* operators association in 1998, with a membership that currently stands at over 1,500. The association is focused around a hire-purchase scheme for bicycles and motorcycles, with 500 members having purchased their bicycle(s) through the scheme, and 20 who have purchased motorcycles. The majority of members join the association with a view to purchasing a bicycle or motorcycle having raised sufficient capital. The association charges entrants a USh2,500 one-off payment, and sells the bicycles (fitted locally with panniers or carriers) through instalment payments (30% deposit, the remainder to be paid within three months).

Several bicycle assembly and repair workshops operate in Iganga Town. Informal discussions revealed that bicycle parts are purchased from traders in the market, who in turn purchase the parts in Jinja or Kampala. Relatively few additions were found to be popular amongst bicycle operators, limited to side paniers and back carriers. Front carriers were tried, but were found to break too easily.

One cart construction and repair workshop exists in Iganga. The workshop is a family business (passed down from father to son), which focuses on human and ox-pulled carts. The work is demand based, and is sufficiently rare to be commissioned from different parts of Uganda.

[39] Minyinda Franko and Kairu Nicholas, based in Bugiri Town.

Kasese

Donor support. The Begian Government has established a programme supporting rural development in Kasese District worth USD 7 million over three years. The programme has five themes including water and sanitation, agriculture (including animal restocking), and roads. The programme is supporting the introduction of oxen for animal traction and transportation in Karasandara sub-county where cotton is a major cash crop.

IMT Support Service. Karughe Farmers Partnership (KFP), Bwera, Kasese is a NGO interested in promoting rural development through diversification of livelihood activities of the poor farmers. It operates in several sub-counties of Kasese District as a change agency for development projects. Ms Janet Biira has undergone a lot of training in animation, donkey utilisation trainer, young progressive farmer and group formation and dynamics. This NGO will be key in introducing donkeys to Kasese and in participatory monitoring of the donkeys. Presently, the NGO has introduced a few donkeys to Nyakiyumbu and it is also testing a donkey cart. The NGO also gives services to other donkey owners in Kasese District not numbering more than six.

Kalehe Construction Enterprise For Animal Traction Equipments (KACEATE) is a sister organization of Karughe Farmers Partnership which is operating a workshop for producing animal traction implements and is interested in producing animal carts if training for their carpenter could be done. Presently, the workshop is producing pannier frames, carts at low standard and other furniture on demand. Through this workshop, it could be possible to make and monitor donkey carts in Nyakiyumbu sub-county.

Credit. The Catholic Church in Kasese District is running two credit programmes: Kasese Microfinance Company Ltd and the Kasese Microfinance Project.

Kasese Microfinance Company Ltd. The company is funded by the GoU's Prime Minister's Office, initiated in October 2001 to focus on poverty alleviation through credit for rural women. It is overseen by the Bishop, has a coordinator and a part-time manager (who also manages the other credit project full-time) and two loan officers. The programme provides loans to a minimum of USh100,000 up to USh1.5mn. Typical loans fall in the range of USh600,000 - USh700,000. Interest is charged at 3% per month, and full repayment must be made within 6 months. Once a loan is given, two months interest must be paid up-front (2*3%) plus a 1% commitment fee. The loan + 3% interest must be paid back monthly.

Application process includes forms to be filled in and delivered to the office in Kasese – with the presence and signature of two guarantors and the LCI chairman to ensure repayment. In the case of default, a guarantor must pay, or an item of the debitor can be taken and sold, e.g. land, to pay the loan back. Training is provided to the clients on acceptance of their application – focusing on book keeping and money management. The current default rate is estimated to be 20%.

The scheme is advertised through the radio and letters through churches. Emphasis is placed on lending for small enterprise/ business – trading in clothes, fish, produce and

giving cash for wholesalers to expand their business. The principle followed is that it will only lend to 'stable' enterprises, as defined by those likely to be pay back the loan on regular basis and in its entirety. The company started by giving some agricultural loans, e.g. for coffee trading, but stopped due to the unreliability of repayments

The current client base is 155 to date (September 2002), of whom roughly 60 are in 5 groups, the rest are individual clients. The individual clients are split between rural and urban areas (even though the target is to help rural women), and concentrated in two sub-counties: Busongoro and Bukonjo West – although in principle credit is available to anyone in the district. The five groups range from one of 40 women fish traders who received a loan 3mn Shillings – split it between the women, and paid it back in the 6 month period. One of 5 women (USh1mn) who engaged in clothes trading, and have paid it back. One of 3 men who were fish traders (USh535,000), one of 2 women (USh75,000) who traded clothes in the district purchased in the DRC and one of 5 women (USh300,000) trading cassava flour.

The company has to pay the government back every month a part of the capital (within a 2-3 year scheme) plus 13.5% interest per annum. Nevertheless, the capital within the company has grown from the initial USh40mn to USh58mn since October 2001. The number of applications is now greater than the fund, and thus they are having to delay loan disbursement. However, the government is undecided how to move forward with the initiative.

When asked whether or not funds may be available to farmers, or farmer groups who wish to purchase IMTs, it was felt that whilst the company has a strict repayment schedule, some flexibility might be possible depending on circumstance and guarantee. However, it was noted that difficulties already experienced by those with loans stem in part from the need to travel regularly to the Company's Kasese Town office, where the repayment must be made.

Kasese Microfinance Project. The Microfinance project began in 1998 by the Catholic Diocese of Kasese as a small project with 12 groups within a radius of 30km of Kasese. The project is funded by the Catholic Church (Catholic Relief Services, Troccaire) and the European Union. The project is a saving and credit scheme, with savings constituted of the profits made from the loans, and further loans are predicated on the saving of profits in a group bank account.

The project aims to target poor rural women, through loans targeted for trading and petty business. There are no agricultural loans, with the exception of agricultural produce trading. Loans are distributed through group structures developed by the programme (involving a process of sensitisation, followed by training in savings mentality, reasons why they are poor, bookkeeping and female emancipation). Currently, 230 groups are engaged from all over the district, with an average constitution of 30 members per group. Groups are encouraged to register themselves, which turns them into legal entities, facilitating empowerment and the attraction of funds from elsewhere (e.g. some groups were used as a vehicle for activities of a health NGO). Currently 180 are registered so far. More than 80% of group members are women, but it was noted that there is a danger that men are often in the position of secretary or chairperson controlling the money.

Individuals do not pay membership fees. Loans are given to the chairperson/ secretary and disbursed among the members. Peer pressure is used to ensure repayment. Distribution is monitored by the project in the early phases. Funding works on cycles. The first cycle is usually around USh50,000 with a repayment schedule of 4 months with 3% monthly interest charge. If the group achieves repayment, and saves its profit, it moves into a second and then further phases where amounts go up and the schedule is adjusted according to need.

The project has extension agents which visit each group each week to recover payments and support training exercises. However, transport was noted to be a problem for the group heads to deposit savings (bank accounts are held in a Kasese Bank under the group name – but with individual sub-accounts).

Total current savings amount to USh363mn, with current loans valued at USh347mn. It is recognised to be a loss-making project – due to overheads of training and visiting (for example, in the previous month they spent USh15mn and only recovered USh10mn). Some corruption has been found (7 groups), typically embezzlement by chairpersons. However, repayment over the life of the project has been good – only USh15 million has not been recovered. Lost repayments are not reclaimed. After 4 months, defaulters are written off- but will not receive more funds

The project is about to expand to four other districts and become a regional (western Uganda) credit programme, and a limited company

The project was interested in potential collaboration with the IMT project. They are flexible about repayment if the IMT project can provide evidence of the fungibility (i.e. sufficient training and support for the likely success of introducing IMTs in terms of healthy and timely repayment of loans to purchase the IMTs).

United Farmers for Animal Traction Group. A visit to Karusandara sub-county, Kasese District, identified a number of farmers using oxen, ploughs and a sledge. The 'United Farmers for Animal Traction' is a group started in 1994 by an immigrant from Kumi District (in 1988), eastern Uganda, a region which has a tradition of using animal traction. The group, with 10 members, purchased 10 acres of land and one pair of oxen, through each contributing USh50,000. The oxen are used to prepare the shared-ownership land for cash and food crops, and are rented out at USh30,000 Shillings per acre for ploughing others' land (at a rate of one acre per day). A self-made 'sledge' is used to transport sacks of produce from the village to market, dragged along behind the oxen. The sledge can carry a maximum of five sacks of 100 kg, with a trip to Kasese Town and back taking all day.

The success of the group has enabled them to purchase two more oxen last year (2001) at a cost of USh250,000 each. The group has expanded to 16 people, with a potential to expand to 54 people (of those who are interested to join).

One other member of the group was familiar with oxen, himself an immigrant from Tororo, eastern Uganda (in 1970). Between them, they expressed the extreme reservations found in the community about the use of animals for labour. The majority of inhabitants feel that animals are not capable of this labour over an

extended period. However, over a period of over five years, the attitude has begun to change as they see the benefits in terms of labour-saving ploughing, transport to market, and the maintained health of the animals. Further, pastoralists who are seasonally located in part of Karusandara sub-county are becoming interested in the use of oxen for ploughing. This was noted to be in-part a reflection of the increasingly sedentary livestyle of pastoralists, as grazing zones are decreasing in size.

The group, which now intends to split into three as the numbers have increased, have not received any formal training. Particular needs identified related to the improvement of the plough, due to the heaviness of the soil, and improving the capacity of the sledge. Repairs are done by the group leader, with spares purchased from the nearby cement factory in Hima, which gets parts from Kampala.

Within this group, whilst members had heard of the Catholic credit funds, no one had benefitted from them- they were perceived to be for 'business people' and not agriculturalists. There was limited knowledge of donkeys amongst the group: they knew of one man from Kasese who owned four donkeys, two of which had since died. They were aware of some disadvantages of investing in pack animals, namely air-born disease and thus the need for preventative and curative medicine, and the need for considerable land for feed.

Katakwi District

Youth With a Mission (YWAM). Youth With a Mission (YWAM) is an NGO, which has been operating in Katakwi, for about four years. YWAM is a Christian NGO with a UK Headquarters. One of YWAM Katakwi's main activities in combating poverty is to develop (and sell) affordable means of local transport, particularly animal-drawn carts. Allan Chadborn the Manager previously worked in Asamuk, a sub-County of Katakwi District, for about five years. There is also a YWAM centre in Soroti but this was not visited by the project team.

YWAM have manufactured / fabricated 6 carts to their latest design (see PhotoA5.1) but they have been unable to sell any. This design results in a relatively inexpensive cart and is the outcome of several years of development by A. Chadborn. His aim in cart design has been to achieve a good compromise between economy, durability and efficacy. Chadborn's design criteria are for his design(s) to be suitable for local fabrication using readily available components and to be repaired easily by local carpenters.

The lack of sales has disappointed Chadborn but he feels he has not advertised or promoted the carts widely enough. Also, would-be purchasers may not be convinced of the durability of the design. By his own admission, Chadborn has not been able to undertake a rigorous testing programme and so is not in a position to offer any guarantees. The lack of testing and promotion are both due to a lack of resources to pursue these activities. Nevertheless, some testing experience is accumulating as he uses one of his carts to collect water (c. 320 liters) every day or so. Chadborn feels that the locals who have observed this over the past few weeks should be aware that his cart operates well. Chadborn also promoted his cart design at the ATNESA

International Workshop in Jinja, May 2002. However, there were few, if any, local smallholders at this event and the only potential purchasers would have been NGOs that may be seeking to place carts in communities for development, monitoring or evaluation purposes.

The YWAM workshop is very basic (see Photo A5.5) and does not use mains electrical power. All wood- and metal-working operations are undertaken with hand-tools and heat (in a simple forge), in the case of metal bending and shaping. There is one pillar-drill (hand-powered) with a ½-inch chuck and a range of bits for making holes. A grinding-wheel has been set up driven by pedal-power. The rationale and survival of the workshop are dependent on AC's ingenuity, experience and commitment, which are also key in enthusing the 6 or 7 staff employed at the workshop. Chadborn's determination for the workshop to function without electricity is based on his desire not to provide himself with anything that a local artisan would not be able to access.

Chadborn's interest extends beyond transport to all issues (that might call upon mechanical engineering) of concern to local smallholders – land preparation, weeding, post-harvest operations, road/path-building and, most recently, minimum tillage / conservation agriculture techniques.

With the current cost advantage of the latest YWAM (donkey / ox) cart over a commercially produced cart by SAIMMCO (USh160,000 vs. USh400,000), it should be possible to commercialise the design, absorb the extra overheads and still market a cart much cheaper than the SAIMMCO model. There is however the possibility that YWAM would not be disposed to batch production, always wanting to modify or improve the next item in the batch, thereby not marketing a consistent product.

In conclusion, the expected YWAM contribution to the development of local transport in this research would be the identification of locally sustainable technologies and the fabrication of prototype equipment. The ingenuity in the designs and the designer's background experience of local needs and capabilities suggest that his designs should be widely tested and given to a production engineer for comment, although the YWAM workshop could not service a significant production demand with existing facilities. Batch (factory-style) production of the Centre's preferred cart design and subsequent technical evaluation in the community would be an interesting, and possibly beneficial, exercise but would require resources greater than those that could be provided by YWAM and the local community.

Action Aid. Action Aid's main interest is improving farm productivity and the role of transport in achieving this was acknowledged. However, Action Aid (AA) has promoted only the use of draught animals for providing transport and has not considered the use of other IMTs. Other options are not necessarily excluded but will depend on feedback from farmer groups. As well as farm productivity, AA are interested in improving transport facilities for the sick and for (their) extension workers.

Katakwi District Farmers' Association. Katakwi District Farmers' Association (KADIFA) has 3082 members and their overriding objective is to train farmers – to convert them from subsistence to (small-scale) commercial. KADIFA provides loans,

which, this year, have been used mainly for bicycles and radios (i.e communications). Some of their farmers have expressed an interest in acquiring donkeys but KADIFA does not assist with purchasing stock or crop inputs. According to KADIFA, farmers' greatest problems are the weather and lack of rain.

APPENDICES

APPENDIX 1

APPROPRIATE TRANSPORT FOR MARKETING OF CROP PRODUCE: ANIMAL HUSBANDRY ISSUES, by Dr Kajura Stephen, MAAIF

1. Kasese District

Kasese district is mainly a crop producing district with limited tradition of animal husbandry. However, attitude to livestock farming is gaining root with the major interest being goats, sheep, pig and chicken. Communities in the uplands where forages are available for the livestock keep these types of animals. A cattle keeping community exists in the flat part of the district, the Busongora County.

The district has five veterinaries, two stationed at the district headquarters in Kasese, and the other three stationed at Mukunyu sub county, Busongora county headquarters and Bwera sub county headquarters. There are eight para-vets in the district scattered in the different sub counties of the district. The Agricultural Extension Programme of the Uganda Government supplied each of these staff with a motorcycle to be able to reach the farmers. There are three drug shops in the district supplying drugs to the vets.

The main animal health problems are:

Trypanosomiasis	due to proximity to the Queen Elizabeth National Park where wildlife act as reservoirs of the disease.
African Swine Fever	due to proximity to the Queen Elizabeth National Park where wildlife act as reservoirs of the disease.
Tick borne disease	due to the cost of tick control facilities.
Brucellosis	which leads to wide spread abortions in cattle.
Foot and Mouth disease	due to proximity to the Queen Elizabeth National Park where wildlife act as reservoirs of the disease.

A restocking programme for cattle in the communities financed by the Government of Uganda under the Poverty Eradication Action Programme is being implemented in the district. The communities select a parish restocking committee, which chooses the beneficiaries to get seed stock. Once these produce they pass on the off springs to secondary beneficiaries.

The cows being issued are mainly dairy crossbred animals to increase milk production in the villages.

Specifically for Kyabarungira Sub County a donkey project had been introduced but was not successful due to inadequate preparation of the recipients and lack of follow up. According to Dr. Muhindo Xavier, the vet interviewed, the introduction of oxen in the area would have little success because of lack of enough forage, limited culture of cattle keeping in the area and dire need for beef.

He recommended introduction of donkeys as long as it is accompanied with training, supervision and follow up.

2. Katakwi District

Katakwi district is an agro-pastoral district practicing crop production and has a long history of animal husbandry. The communities have practiced integrated crop and livestock farming for a long time. They use oxen for ploughing and utilize the animal manure for fertilizing their fields. However, livestock farming has had a series of set-backs due mainly to the frequent rustling of their stock by the neighbouring Karamojong pastoral communities. The insurgency of the late 1980s also reduced the cattle numbers greatly. Pigs and exotic crossbred animals have therefore become more dominant since the rustling communities do not prefer these.

The district has seven vets; two are stationed at the district headquarters in Katakwi district, and the rest manning sub counties. There are also three vets working with NGOs (Christian Veterinary Mission) in the district. There are twelve Para vets in the district scattered in the different sub counties of the district. The Agricultural Extension Programme of the Government of Uganda supplies each of these staff with a motorcycle so that they can reach the farmers. There are five drug shops in the district supplying drugs to the vets.

The main animal health problems are:

Trypanosomiasis	due to re-infestation of the area with tsetse flies.
African Swine Fever	due to presence of wild pigs in the district, which act as reservoirs.
Tick borne disease	due to the high cost of tick control facilities.
Foot and Mouth disease	due to uncontrolled cattle movements as livestock farmers flee from cattle rustlers
Rinderpest	although government has done a lot of work and has almost eradicated this disease in the district, it used to be a problem as a result of cattle movements.

A restocking programme for cattle in the communities financed by the government of Uganda under the Poverty Eradication Action Programme is being implemented in the district. The communities select a parish restocking committee, which chooses the beneficiaries to get seed stock. Once these produce they pass on the offspring to secondary beneficiaries. The cows being issued are mainly dairy crossbred animals to increase milk production in the villages.

The communities would gain a lot if they were given oxen and carts as a means of transport. This needs to be seen in light of their long tradition of cattle keeping in the district, relative experience of the communities to handle some of the disease control problems, and the current efforts by the government to control cattle rustling,.

Veterinary capacity exists to take care of these animals.

Appendix 2: References

Ahmed, R. and N. Rustagi (1987), *Marketing and Price Incentives in African and Asian Countries: A Comparison*. In D. Eltz (ed) Agricultural Marketing Strategy and Pricing Policy. Washington D.C.: World Bank.

Akidi P., Kaira C., Kwamusi P., Okure M., and Seruwo, L. (1997), *Agricultural Rural Transport and Development – Uganda*, Country paper presented at an East Africa Regional Project Planning Workshop (2 - 8 November, 1997) in Thika/Kenya, as part of Agricultural Rural Transport Research Project, sponsored by DFID.

Anchirinah, V.M. and Yoder, R. (2000), *Evaluation of the Pilot Phase of the Intermediate Means of Transport (IMT) of the Village Infrastructure Project*. Prepared for SelfHelp Foundation and GRATIS, Kumasi, December 1998. Quoted in Porter (2002)

Appleton, S., Emwanu, T., Kagugube J., Muwonge J, 1999, Changes in poverty in Uganda, 1992-1997, WPS/99.22, Centre for the Study of African Economies, University of Oxford.

Barwell, I. (1996), *Transport and the Village*, World Bank Discussion Paper No. 344, Africa Region Series, The World Bank, Washington D.C.

Booth, D., Holland, J., Hentschel, J., Lanjouw, P. and A. Herbert, 1998, "Participation and Combined Methods in African Poverty Assessment: Reviewing the Agenda" Social Development Department, DFID

Dennis, Ron (2002), *Rural Accessibility: Footpaths and Tracks*. A field manual for their Construction and Maintenance. Prepared for the ILO by I.T. Transport.

Denzin, N.K. and Y. S. Lincoln, eds., 1994, Handbook of Qualitative Research, Thousand Oaks, CA: Sage

Dunkerley, C.E. (2003) Transport Economics Aspects of IMTs for Poor Farmers in Uganda, unpublished project report; Transport Research Laboratory, Crowthorne, UK

Ellis, Simon (1998), *The Economics of the Provision of Rural Transport Services*. Regional Seminar on Intermediate Means of Transport Galle, Sri Lanka. March 20-21.

Gebresenbet G., O'Neill D., Mutua J., and Oram C. (1997), *Technological Support for Rural Agricultural Transport and Development*, Paper presented at an East Africa Regional Project Planning Workshop (2-8 November, 1997) in Thika/Kenya, as part of Agricultural Rural Transport Research Project, sponsored by DFID.

Government of Uganda (2000) Plan for Modernisation of Agriculture: Eradicating Poverty in Uganda, Final Draft, MAAIF / MFPED, Entebbe / Kampala.

Hentschel, J., 1998, "Distinguishing between Types of Data and Methods of Collecting Them", Poverty Research Working Group, WPS1914, World Bank

Hine, John and Ellis, Simon (2001), *Agricultural Marketing and Access to Transport Services*. Rural Transport and Knowledge Base. It can be found at: www.transport-links.org/KnowledgeBase.htm

Hine, J. L., J.D.N. Riverson and E.A. Kwakye (1983b), *Accessibility, Transport Costs and Food Marketing in the Ashanti Region in Ghana*. TRRL Report SR 809. Crowthorne: Transport and Road Research Laboratory.

Howe, John (2001), *The Headloading and Footpath Economy – Walking in Sub-Saharan Africa.* World Transport Policy and Practise, Vol. 7, No 4.

Howe, J. and Barwell, I. (1987), *Study of Potential for Intermediate Means of Transport* (2 vols.) IT Transport. June.

Kleih, U., Odwongo, W. and Ndyashangaki, C. (1999), *Community Access to Marketing Opportunities – Options for Remote Areas: Uganda Case Study*. Natural Resources Institute and Agricultural Policy Secretariat.

Malmberg-Calvo, C. (1998), *Options for Managing and Financing Rural Transport Infrastructure*. Washington D.C.: World Bank Technical Paper 411. Quoted in Porter (2002)

Marsland et al (2000) A Methodological Framework for Combining Quantitative and Qualitative Survey Methods, Natural Resources Institute, Chatham, UK.

McGee, R., 2000, Analysis of Participatory Poverty Assessment (PPA) and household survey findings on poverty trends in Uganda, Mission Report 10-18 February 2000, IDS.

Natural Resources Institute and Foodnet (2002) Transaction Cost Analysis, prepared for the Plan for Modernisation of Agriculture; Kampala.

O'Neill, D.H. (2002), *Crop Marketing and Transport in Uganda*. Silsoe Research Institute, unpublished project report (IDG/02/29), Silsoe Research Institute, Bedfordshire, UK..

Porter, Gina (2002), *Intermediate Means of Transport: A Review Paper with Special Reference to Ghana*. Output Paper from the Crop Post Harvest Programme programme R7575, DFID. Department of Anthropology, University of Durham.

Rizet, C. and J. Hine (1993), *A Comparison of the Costs and Productivity of Road Freight Transport in Africa and Pakistan*. Transport Reviews 13(2).

Smith, D.R. and Zwick, K., 2001, Access to Rural Non-Farm Livelihoods: Report of Preliminary Field Work in Kumi District, Uganda, Report 2596 for DFID-funded project, Natural Resources Institute, U.K.

Smith, D.W., Sims B.G. and O'Neill, D.H. (1994) Testing and evaluation of agricultural machinery and equipment – principles and practices. FAO Agricultural Services Bulletin 110, FAO, Rome. 272pp. ISBN 95-5-103458-3.

Starkey, Paul. (2002), *Promoting the Use of Intermediate Means of Transport – Vehicle Choice, Potential Barriers and Criteria for Success*. Rural Transport and Knowledge Base. It can be found at: www.transport-links.org/KnowledgeBase.htm

Uganda Participatory Poverty Assessment Project (UPPAP), 1999, Uganda Participatory Poverty Assessment Report – Learning from the Poor, Ministry of Finance Planning and Economic Development, Government of Uganda.

Appendix 3

Selected Household Survey Results

(Tables and figures which were not presented in the main text)

Table A1: Iganga - Crops planted; Responsibility by Gender

	Planted by household (%)	Planted by men	Planted by women	Planted by both
Maize	99%	40%	6%	54%
Rice	18%	65%	0%	35%
Cassava	93%	31%	20%	49%
Beans	92%	22%	26%	52%
Sweet Potato	89%	19%	42%	39%
Ground nuts	84%	20%	25%	55%
Green Grams	16%	59%	0%	41%
Banana	60%	24%	38%	39%
Irish Potato	0%			
Pineapple	15%	70%	0%	30%
Passion Fruit	1%	0%	50%	50%
Coffee	54%	70%	4%	26%
Cotton	23%	58%	3%	39%
Other	31%	54%	5%	42%

Table A2: Kasese - Crops planted; Responsibility by Gender

	Planted by household (%)	Planted by men	Planted by women	Planted by both
Maize	33%	12%	30%	58%
Rice	0%	-	-	-
Cassava	92%	4%	29%	67%
Beans	94%	5%	33%	62%
Sweet Potato	23%	3%	47%	50%
Ground nuts	34%	5%	16%	79%
Green Grams	32%	27%	12%	61%
Banana	84%	27%	9%	64%
Irish Potato	33%	2%	37%	61%
Pineapple	11%	14%	7%	79%
Passion Fruit	47%	21%	15%	64%
Coffee	93%	28%	8%	64%
Cotton	25%	30%	9%	61%
Other	18%	13%	4%	83%

Table A3: Katakwi - Crops planted; Responsibility by Gender

	Planted by household (%)	Planted by men	Planted by women	Planted by both
Maize	47%	24%	18%	59%
Rice	15%	25%	5%	70%
Cassava	60%	23%	15%	63%
Beans	2%	0%	0%	100%
Sweet Potato	47%	14%	19%	67%
Ground nuts	62%	16%	18%	66%
Green Grams	41%	11%	24%	65%
Banana	1%	0%	100%	0%
Irish Potato	0%	-	-	-
Pineapple	1%	0%	100%	0%
Passion Fruit	0%	-	-	-
Coffee	5%	17%	17%	67%
Cotton	5%	14%	14%	71%
Other	80%	20%	22%	58%

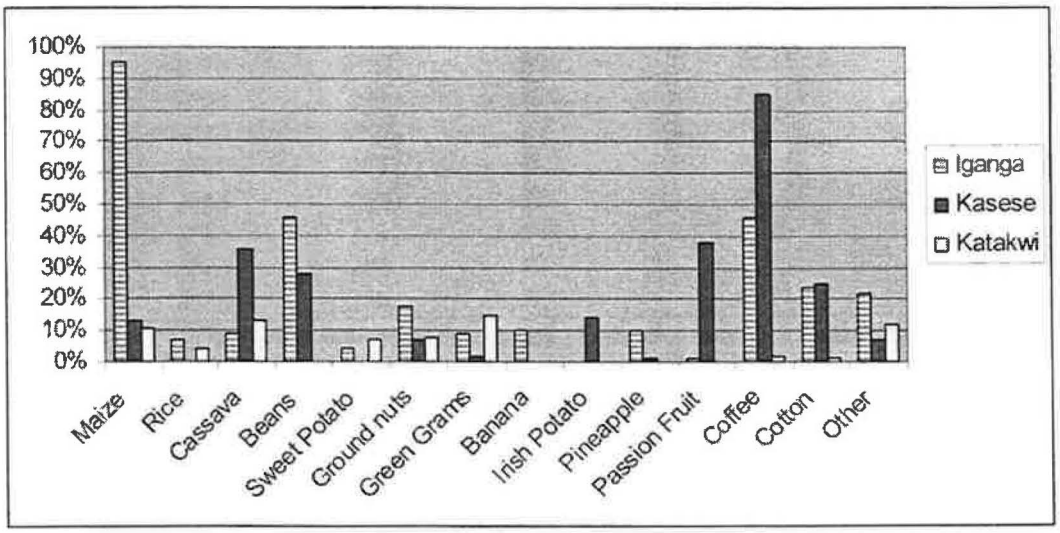
NB: The percentage related to gender adds up to 100 for the households which actually cultivate the crop.

Agricultural Marketing during the last 12 months

Table A4: Crops Marketed (% of households)

	Iganga	Kasese	Katakwi
Maize	95%	13%	11%
Rice	7%	0%	4%
Cassava	9%	36%	13%
Beans	46%	28%	0%
Sweet Potato	4%	0%	7%
Ground nuts	18%	7%	8%
Green Grams	9%	2%	15%
Banana	10%	0%	0%
Irish Potato	0%	14%	0%
Pineapple	10%	1%	0%
Passion Fruit	1%	38%	0%
Coffee	46%	85%	2%
Cotton	24%	25%	1%
Other	22%	7%	12%

Figure A1: Crops Marketed During the Last 12 Months (% of households)



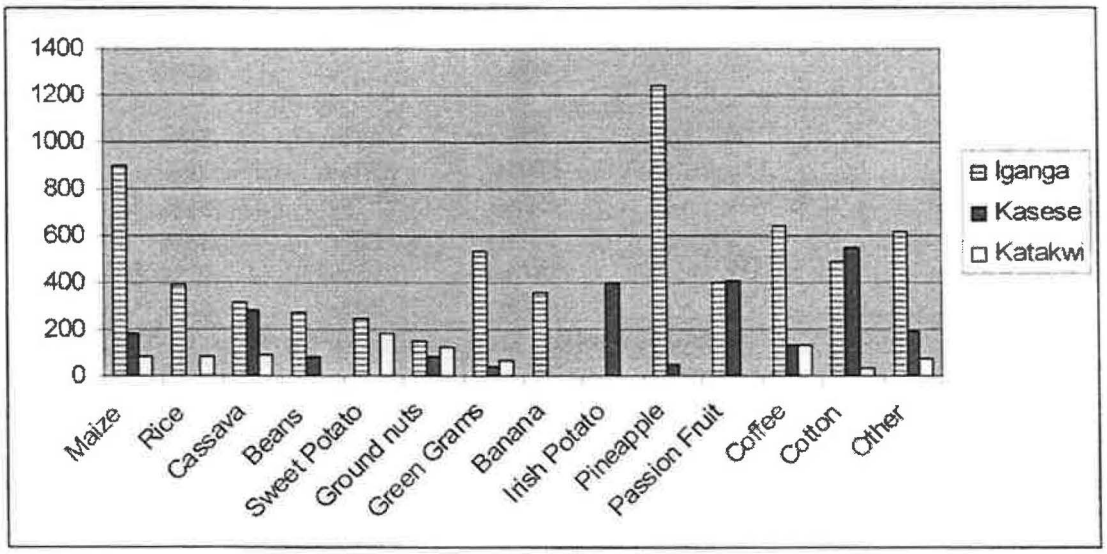
Mean Quantities sold per household (in kg)

Table A5: Crops Marketed (mean kg per household)

	Iganga	Kasese	Katakwi
Maize	901	182	81
Rice	390	-	86
Cassava	318	282	88
Beans	278	85	-
Sweet Potato	250	-	183
Ground nuts	152	81	123
Green Grams	531	38	66
Banana	356	-	-
Irish Potato	-	396	-
Pineapple	1240	50	-
Passion Fruit	400	405	-
Coffee	644	134	137
Cotton	490	547	30
Other	614	193	77

NB: The mean quantities refer to those households that sold at least some.

Figure A2: Crops Marketed (mean kg per household)



NB: The mean quantities refer to those households that sold at least some.

Table A6: Iganga - Crops Marketed; Responsibility for Sale, by Gender

	Crops Marketed (% of households)	Men responsible	Women responsible	Both responsible
Maize	95%	67%	6%	28%
Rice	7%	80%	0%	20%
Cassava	9%	73%	18%	9%
Beans	46%	53%	12%	35%
Sweet Potato	4%	40%	40%	20%
Ground nuts	18%	38%	25%	38%
Green Grams	9%	90%	0%	10%
Banana	10%	64%	14%	21%
Irish Potato	0%	-	-	-
Pineapple	10%	86%	0%	14%
Passion Fruit	1%	0%	0%	100%
Coffee	46%	76%	7%	17%
Cotton	24%	75%	3%	22%
Other	22%	63%	7%	30%

Table A7: Kasese - Crops Marketed; Responsibility for Sale, by Gender

	Crops Marketed (% of households)	Men responsible	Women responsible	Both responsible
Maize	13%	18%	24%	59%
Rice	0%	-	-	-
Cassava	36%	11%	30%	59%
Beans	28%	3%	35%	62%
Sweet Potato	0%	-	-	-
Ground nuts	7%	11%	33%	56%
Green Grams	2%	0%	33%	67%
Banana	0%	-	-	-
Irish Potato	14%	0%	44%	56%
Pineapple	1%	100%	0%	0%
Passion Fruit	38%	22%	27%	51%
Coffee	85%	53%	12%	36%
Cotton	25%	66%	13%	22%
Other	7%	11%	22%	67%

Table A8: Katakwi - Crops Marketed; Responsibility for Sale, by Gender

	Crops Marketed (% of households)	Men responsible	Women responsible	Both responsible
Maize	11%	79%	7%	14%
Rice	4%	80%	0%	20%
Cassava	13%	82%	6%	12%
Beans	0%	-	-	-
Sweet Potato	7%	89%	11%	0%
Ground nuts	8%	80%	20%	0%
Green Grams	15%	50%	20%	30%
Banana	0%	-	-	-
Irish Potato	0%	-	-	-
Pineapple	0%	-	-	-
Passion Fruit	0%	-	-	-
Coffee	2%	67%	0%	33%
Cotton	1%	100%	0%	0%
Other	12%	56%	25%	19%

NB: The percentage related to gender adds up to 100 for the households which actually cultivate the crop.

Table A9: Iganga - Buyers of Majority of Crop (from Farmers)

	Village Agent	Non-local trader	Group	Private company	Neighbours	Others
Maize	34%	57%	2%	1%	1%	6%
Rice	0%	90%	0%	0%	0%	10%
Cassava	8%	85%	0%	0%	0%	8%
Beans	26%	62%	0%	2%	2%	8%
Sweet Potato	60%	40%	0%	0%	0%	0%
Ground nuts	25%	75%	0%	0%	0%	0%
Green Grams	17%	50%	0%	0%	0%	33%
Banana	36%	50%	0%	0%	0%	14%
Irish Potato	-	-	-	-	-	-
Pineapple	14%	79%	0%	7%	0%	0%
Passion Fruit	0%	0%	0%	0%	100%	0%
Coffee	30%	58%	2%	2%	3%	5%
Cotton	23%	67%	7%	0%	0%	3%
Other	20%	40%	3%	20%	10%	7%

Table A10: Kasese - Buyers of Majority of Crop (from Farmers)

	Village Agent	Non-local trader	Group	Private company	Neighbours	Others
Maize	18%	82%	0%	0%	0%	0%
Rice	-	-	-	-	-	-
Cassava	15%	70%	0%	0%	13%	2%
Beans	15%	74%	0%	0%	12%	0%
Sweet Potato	-	-	-	-	-	-
Ground nuts	22%	78%	0%	0%	0%	0%
Green Grams	0%	0%	0%	0%	67%	33%
Banana	-	-	-	-	-	-
Irish Potato	6%	89%	6%	0%	0%	0%
Pineapple	0%	0%	0%	0%	100%	0%
Passion Fruit	18%	74%	4%	0%	4%	0%
Coffee	8%	90%	1%	1%	0%	0%
Cotton	3%	25%	59%	13%	0%	0%
Other	0%	67%	11%	11%	11%	0%

Table A11: Katakwi - Buyers of Majority of Crop (from Farmers)

	Village Agent	Non-local trader	Group	Private company	Neighbours	Others
Maize	36%	57%	7%	0%	0%	0%
Rice	40%	60%	0%	0%	0%	0%
Cassava	47%	53%	0%	0%	0%	0%
Beans	-	-	-	-	-	-
Sweet Potato	33%	67%	0%	0%	0%	0%
Ground nuts	36%	64%	0%	0%	0%	0%
Green Grams	45%	55%	0%	0%	0%	0%
Banana	-	-	-	-	-	-
Irish Potato	-	-	-	-	-	-
Pineapple	-	-	-	-	-	-
Passion Fruit	-	-	-	-	-	-
Coffee	33%	67%	0%	0%	0%	0%
Cotton	0%	100%	0%	0%	0%	0%
Other	31%	69%	0%	0%	0%	0%

NB: The percentages refer to households that sold at least some of the crop

Agricultural Marketing

Table A12: Farmers' reasons for selling to stipulated buyer

District	only known buyer	always sell to this person	Believe this buyer offers better price	Because he provides inputs	Due to lack of own transportation	Because can't wait any longer to sell
Iganga	17%	23%	68%	3%	37%	2%
Kasese	39%	24%	85%	8%	6%	4%
Katakwi	1%	39%	68%	0%	25%	1%

NB: Two answers were possible

Table A13: Distance to main market, and months p.a. without access to market

District	Sub-Counties	Mean # kms to main market	Mean # months p.a. without access to market using transport
Iganga	Ivukula	10	4
	Bukanaga	12	4
	Makutu	10	3
	Total	11	4
Kasese	Kyabarungira	17	11
	Mahango	14	11
	Nyakiyumbu	8	8
	Total	13	10
Katakwi	Asamuku	11	5
	Orungo	12	4
	Kapujan	25	3
	Total	16	4

NB: Questions were posed as follows:
- How many kilometres is your main market ?
- How many months of the year do you not have access to the nearest market using transport (e.g. bicycle, motorcycle, pick-up)?

Table A14: Domestic and Service Transport Use

	Iganga	Kasese	Katakwi
Water Carriage			
% using FOOT as main mode	83%	100%	98%
Trips per day (No)	2.5	1.2	2.1
Average trip time (mins)	53	118	41
% using BICYCLE as main mode	15%	0%	1%
Trips per day (No)	1.9		1.0
Average trip time (mins)	41		20
% using WHEELBARROW as main mode	2%	0%	2%
Trips per day (No)	4.0		2.5
Wood Collection			
Trips per day (No)	1.3	1.1	1.0
% using foot as main mode	100%	100%	100%
Average trip time (mins)	89	131	74
Buying Consumer Goods			
% using FOOT as main mode	70%	96%	66%
Trips per month (No)	4.3	1.9	1.0
Average trip time (mins)	46	368	163
% using BICYCLE as main mode	30%	2%	34%
Trips per month (No)	4.7	1.0	1.1
Average trip time (mins)	71	163	99
% using PICK-UP as main mode	0%	2%	0%
Trips per month (No)		2.5	
Average trip time (mins)		300	
Healthcare			
% using FOOT as main mode	13%	96%	65%
Trips per month (No)	2.5	1.7	1.1
Average trip time (mins)	191	327	158
% using BICYCLE as main mode	85%	2%	35%
Trips per month (No)	2.5	1.5	1.6
Average trip time (mins)	215	210	93
% using PICK-UP as main mode	0%	2%	0%
Trips per month (No)		1.3	
Average trip time (mins)		180	
% using TAXI as main mode	2%	0%	0%
Trips per month (No)	2.5		
Average trip time (mins)	390		
Education			
% using FOOT as main mode	100%	100%	100%
Average trip time (mins)	52	158	52
Social Reasons			
% using FOOT as main mode	5%	98%	70%
Trips per month (No)	3.2	1.2	1.1
Average trip time (mins)	206	322	37
% using BICYCLE as main mode	90%	1%	30%
Trips per month (No)	3.4	1.0	1.1
Average trip time (mins)	344	260	36
% using PICK-UP as main mode	0%	1%	0%
Trips per month (No)		1.0	
Average trip time (mins)		200	
% using TAXI as main mode	5%	0%	0%
Trips per month (No)	1.8		
Average trip time (mins)	480		

Transportation from Field to Home / Store

Table A15: Transportation to Store – Iganga (% of households)

	On Foot	Wheel-barrow	Bicycle	Bicycle & trailer	Ox cart	Lorry
Maize	78%	1%	21%	0%	0%	0%
Rice	39%	0%	61%	0%	0%	0%
Cassava	95%	1%	3%	1%	0%	0%
Beans	95%	1%	4%	0%	0%	0%
Sweet Potato	97%	1%	2%	1%	0%	0%
Ground nuts	99%	1%	0%	0%	0%	0%
Green Grams	64%	0%	36%	0%	0%	0%
Banana	98%	1%	1%	0%	0%	0%
Irish Potato	-	-	-	-	-	-
Pineapple	85%	5%	5%	5%	0%	0%
Passion Fruit	100%	0%	0%	0%	0%	0%
Coffee	69%	0%	32%	0%	0%	0%
Cotton	97%	0%	3%	0%	0%	0%
Other	78%	0%	20%	0%	0%	2%

Table A16: Transportation to Store – Kasese

	On Foot	Wheel-barrow	Bicycle	Bicycle & trailer	Ox cart	Lorry
Maize	95%	0%	5%	0%	0%	0%
Rice	-	-	-	-	-	-
Cassava	100%	0%	0%	0%	0%	0%
Beans	99%	0%	1%	0%	0%	0%
Sweet Potato	100%	0%	0%	0%	0%	0%
Ground nuts	95%	0%	5%	0%	0%	0%
Green Grams	100%	0%	0%	0%	0%	0%
Banana	100%	0%	0%	0%	0%	0%
Irish Potato	100%	0%	0%	0%	0%	0%
Pineapple	100%	0%	0%	0%	0%	0%
Passion Fruit	100%	0%	0%	0%	0%	0%
Coffee	98%	0%	2%	0%	0%	0%
Cotton	91%	0%	9%	0%	0%	0%
Other	100%	0%	0%	0%	0%	0%

Table A17: Transportation to Store – Katakwi

	On Foot	Wheel-barrow	Bicycle	Bicycle & trailer	Ox cart	Lorry
Maize	89%	5%	3%	0%	3%	0%
Rice	90%	0%	10%	0%	0%	0%
Cassava	87%	4%	6%	0%	3%	0%
Beans	100%	0%	0%	0%	0%	0%
Sweet Potato	92%	5%	2%	0%	2%	0%
Ground nuts	90%	2%	4%	0%	4%	0%
Green Grams	93%	2%	4%	0%	2%	0%
Banana	100%	0%	0%	0%	0%	0%
Irish Potato	-	-	-	-	-	-
Pineapple	100%	0%	0%	0%	0%	0%
Passion Fruit	-	-	-	-	-	-
Coffee	67%	17%	0%	0%	17%	0%
Cotton	86%	0%	0%	0%	14%	0%
Other	90%	2%	5%	0%	4%	0%

NB: Percentages refer to households that have grown at least some of the crop

Agricultural Marketing during the last 12 Months – Means of Transportation to Village Market

Table A18: Transport to Village Market – Iganga

	Foot	Bicycle	Lorry
Maize	0%	100%	0%
Rice	0%	100%	0%
Cassava	0%	100%	0%
Beans	0%	100%	0%
Sweet Potato	-	-	-
Ground nuts	100%	0%	0%
Green Grams	0%	100%	0%
Banana	0%	100%	0%
Irish Potato	-	-	-
Pineapple	-	-	-
Passion Fruit	-	-	-
Coffee	0%	100%	0%
Cotton	0%	100%	0%
Other	0%	100%	0%

Table A19: Transport to Village Market – Kasese

	Foot	Bicycle	Lorry
Maize	93%	7%	0%
Rice	-	-	-
Cassava	97%	3%	0%
Beans	100%	0%	0%
Sweet Potato	-	-	-
Ground nuts	100%	0%	0%
Green Grams	100%	0%	0%
Banana	-	-	-
Irish Potato	100%	0%	0%
Pineapple	-	-	-
Passion Fruit	100%	0%	0%
Coffee	96%	5%	0%
Cotton	88%	13%	0%
Other	100%	0%	0%

Table A20: Transport to Village Market – Katakwi

	Foot	Bicycle	Lorry
Maize	25%	25%	50%
Rice	33%	67%	0%
Cassava	43%	29%	29%
Beans	-	-	-
Sweet Potato	57%	29%	14%
Ground nuts	36%	64%	0%
Green Grams	69%	15%	15%
Banana	-	-	-
Irish Potato	-	-	-
Pineapple	-	-	-
Passion Fruit	-	-	-
Coffee	0%	100%	0%
Cotton	100%	0%	0%
Other	27%	36%	36%

NB: Percentages refer to households that have sold at least some in the village market

Means of Transportation to District Market

Table A21: Transport to District Market – Iganga

	Foot	Bicycle	Pick-up	Lorry	Taxi
Maize	0%	38%	25%	25%	13%
Rice	-	-	-	-	-
Cassava	-	-	-	-	-
Beans	0%	50%	33%	0%	17%
Sweet Potato	-	-	-	-	-
Ground nuts	-	-	-	-	-
Green Grams	0%	100%	0%	0%	0%
Banana	0%	50%	0%	50%	0%
Irish Potato	-	-	-	-	-
Pineapple	-	-	-	-	-
Passion Fruit	-	-	-	-	-
Coffee	0%	20%	40%	40%	0%
Cotton	-	-	-	-	-
Other	-	-	-	-	-

Table A22: Transport to District Market – Kasese

	Foot	Bicycle	Pick-up	Lorry	Taxi
Maize	-	-	-	-	-
Rice	-	-	-	-	-
Cassava	-	-	-	-	-
Beans	-	-	-	-	-
Sweet Potato	-	-	-	-	-
Ground nuts	-	-	-	-	-
Green Grams	-	-	-	-	-
Banana	-	-	-	-	-
Irish Potato	100%	0%	0%	0%	0%
Pineapple	-	-	-	-	-
Passion Fruit	100%	0%	0%	0%	0%
Coffee	73%	0%	27%	0%	0%
Cotton	100%	0%	0%	0%	0%
Other	-	-	-	-	-

Table A23: Transport to District Market – Katakwi

	Foot	Bicycle	Pick-up	Lorry	Taxi
Maize	0%	100%	0%	0%	0%
Rice	-	-	-	-	-
Cassava	-	-	-	-	-
Beans	-	-	-	-	-
Sweet Potato	-	-	-	-	-
Ground nuts	-	-	-	-	-
Green Grams	-	-	-	-	-
Banana	-	-	-	-	-
Irish Potato	-	-	-	-	-
Pineapple	-	-	-	-	-
Passion Fruit	-	-	-	-	-
Coffee	-	-	-	-	-
Cotton	-	-	-	-	-
Other	-	-	-	-	-

NB: Percentages refer to households that have sold at least some in the District market

Modes of Transport Used by Occupation (other than crop sales)

Table A24: Modes of Transport Used – Iganga

	Foot	Wheel-barrow	Bicycle	Bicycle - trailer	Pick-up truck
Farming – animal produce sale	33%	0%	67%	0%	0%
Traditional processing	0%	0%	100%	0%	0%
Trade in primary produce	0%	0%	100%	0%	0%
Retail trade	14%	0%	86%	0%	0%
Crafts	100%	0%	0%	0%	0%
Services	67%	0%	33%	0%	0%
Waged or Salaried Work	44%	0%	56%	0%	0%

Table A25: Modes of Transport Used – Kasese

	Foot	Wheel-barrow	Bicycle	Bicycle - trailer	Pick-up truck
Farming – animal produce sale	100%	0%	0%	0%	0%
Traditional processing	88%	13%	0%	0%	0%
Trade in primary produce	100%	0%	0%	0%	0%
Retail trade	50%	0%	25%	0%	25%
Crafts	100%	0%	0%	0%	0%
Services	80%	0%	20%	0%	0%
Waged or Salaried Work	100%	0%	0%	0%	0%

Table A26: Modes of Transport Used – Katakwi

	Foot	Wheel-barrow	Bicycle	Bicycle - trailer	Pick-up truck
Farming – animal produce sale	76%	0%	19%	5%	0%
Traditional processing	86%	0%	14%	0%	0%
Trade in primary produce	100%	0%	0%	0%	0%
Retail trade	67%	0%	33%	0%	0%
Crafts	89%	0%	11%	0%	0%
Services	69%	0%	31%	0%	0%
Waged or Salaried Work	20%	0%	80%	0%	0%

NB: Percentages refer to households that have indicated these occupations

Household Travel and Transport Priorities

Table A27: Household Travel and Transport Priorities – 1st Priority

	Iganga	Kasese	Katakwi
Crop transport – home to farm to store	24%	11%	56%
Crop transport – store to market	6%	14%	6%
Transport of water	0%	0%	2%
Fuelwood transport	0%	0%	2%
Transport of Agric. Inputs	6%	63%	0%
Travel to work (profession)	4%	2%	3%
Transport for other IGAs	14%	7%	30%
Travel to clinic	13%	0%	1%
Travel to school	1%	1%	0%
Travel for social reasons	22%	3%	1%
Other travel reasons	11%	0%	0%

Figure A3: Household Travel and Transport Priorities – 1st Priority

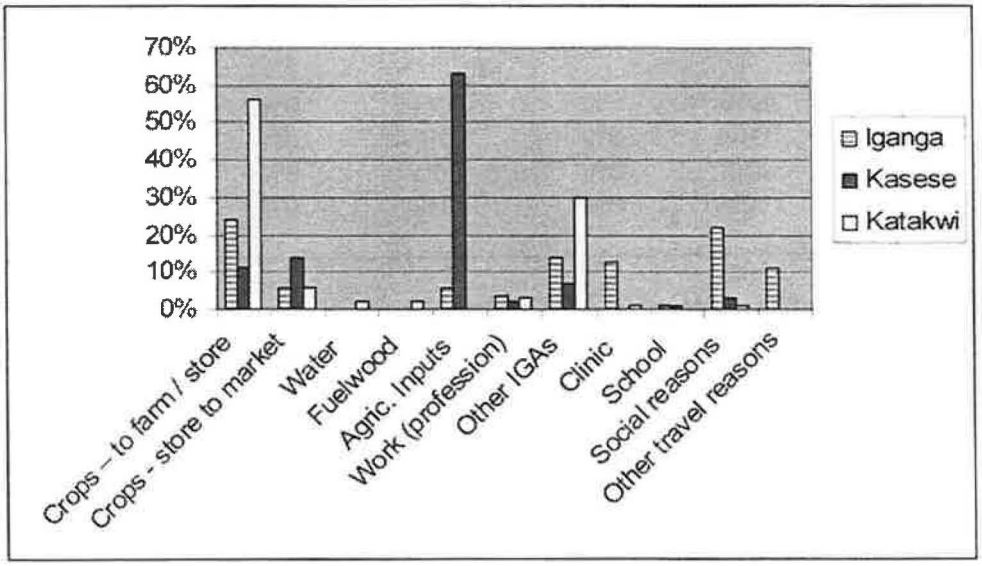


Table A28: Household Travel and Transport Priorities – 2nd Priority

	Iganga	Kasese	Katakwi
Crop transport – home to farm to store	5%	32%	18%
Crop transport – store to market	3%	42%	3%
Transport of water	2%	4%	28%
Fuelwood transport	0%	1%	13%
Transport of Agric. Inputs	4%	13%	0%
Travel to work (profession)	2%	1%	0%
Transport for other IGAs	7%	5%	36%
Travel to clinic	32%	0%	2%
Travel to school	2%	0%	0%
Travel for social reasons	36%	4%	1%
Other travel reasons	7%	0%	0%

Figure A4: Household Travel and Transport Priorities – 2nd Priority

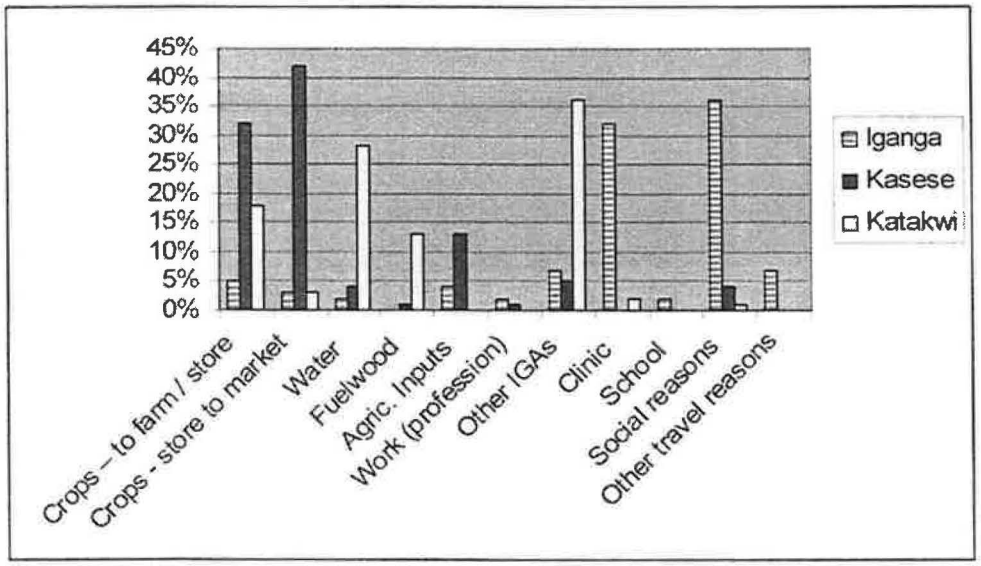
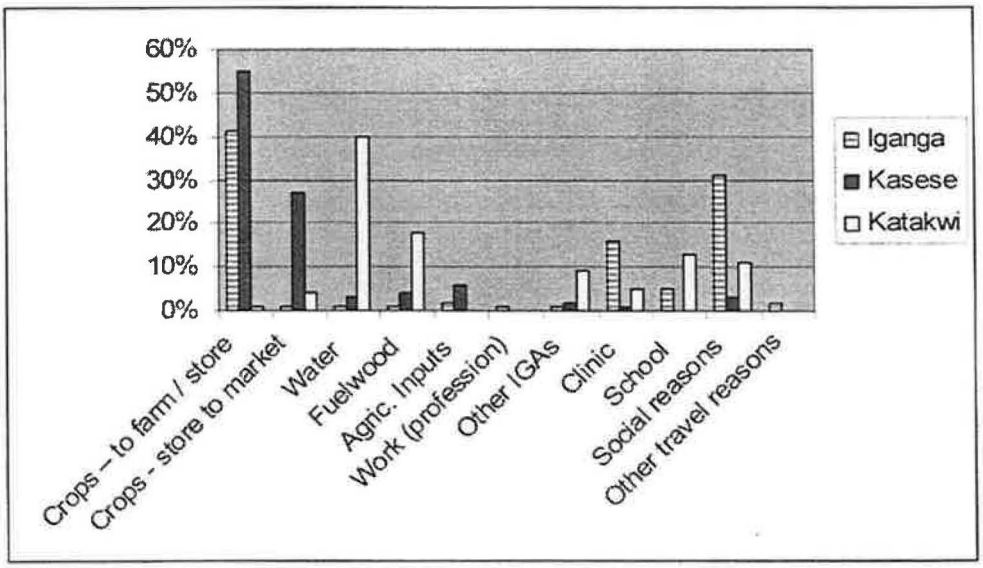


Table A29: Household Travel and Transport Priorities – 3rd Priority

	Iganga	Kasese	Katakwi
Crop transport – home to farm to store	41%	55%	1%
Crop transport – store to market	1%	27%	4%
Transport of water	1%	3%	40%
Fuelwood transport	1%	4%	18%
Transport of Agric. Inputs	2%	6%	0%
Travel to work (profession)	1%	0%	0%
Transport for other IGAs	1%	2%	9%
Travel to clinic	16%	1%	5%
Travel to school	5%	0%	13%
Travel for social reasons	31%	3%	11%
Other travel reasons	2%	0%	0%

Figure A5: Household Travel and Transport Priorities – 3rd Priority



Household Travel and Transport Problems

Table A30: Household Travel and Transport Problems – 1st Priority

	Iganga	Kasese	Katakwi
Transport not available	44%	56%	12%
High cost	27%	42%	85%
Lack of speed	5%	0%	1%
Lack of safety	3%	2%	0%
Other	21%	0%	2%

Figure A6: Household Travel and Transport Problems – 1st Priority

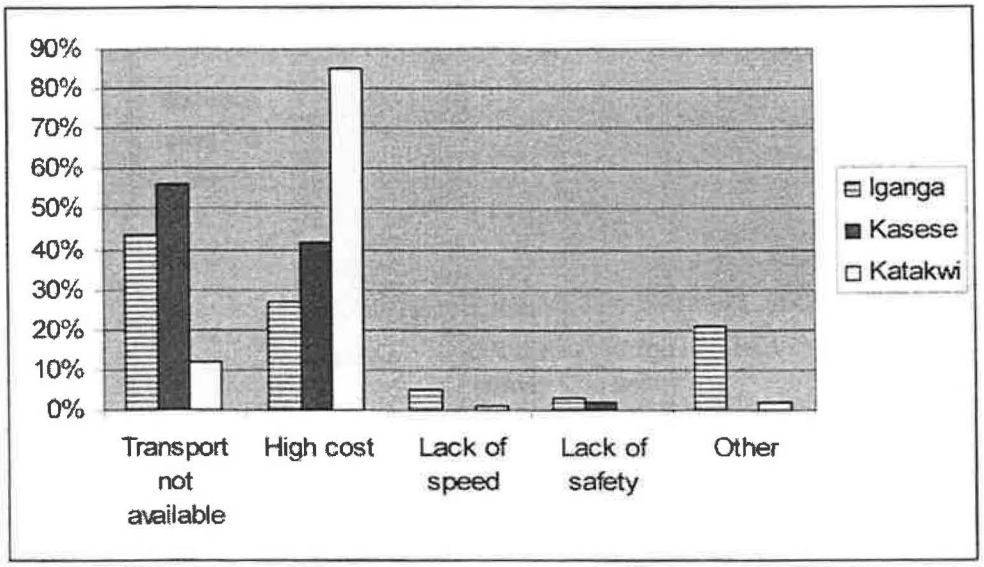


Table A31: Household Travel and Transport Problems – 2nd Priority

	Iganga	Kasese	Katakwi
Transport not available	10%	12%	83%
High cost	38%	56%	15%
Lack of speed	20%	1%	0%
Lack of safety	2%	9%	2%
Other	30%	23%	0%

Figure A7: Household Travel and Transport Problems – 2nd Priority

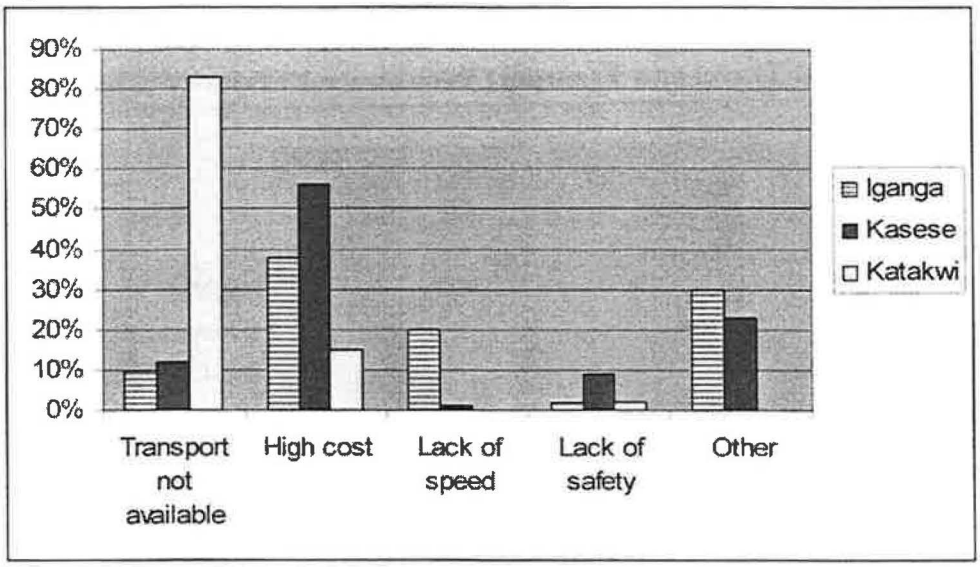


Figure A8: Household Travel and Transport Problems – 1st Priority, by Gender of Respondent

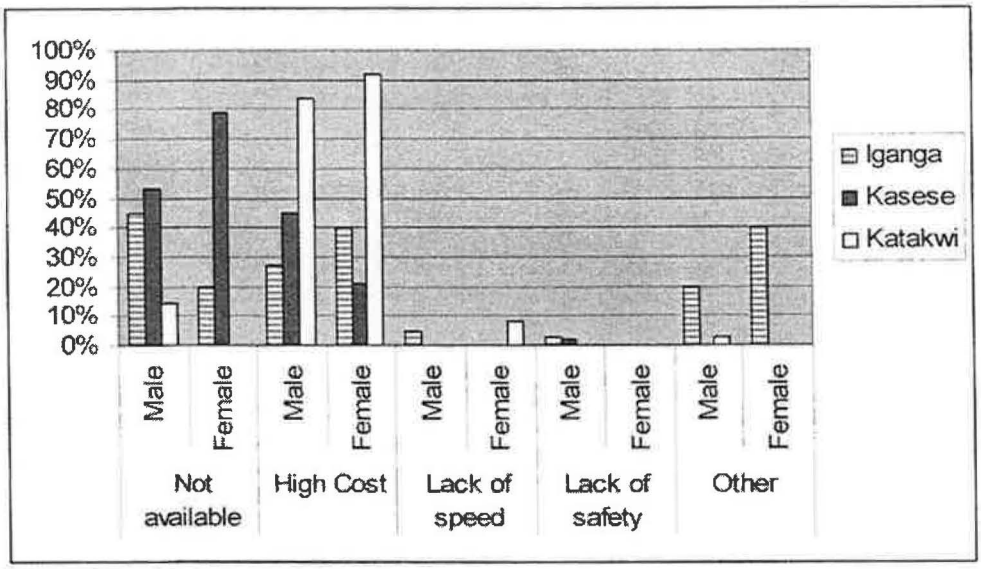
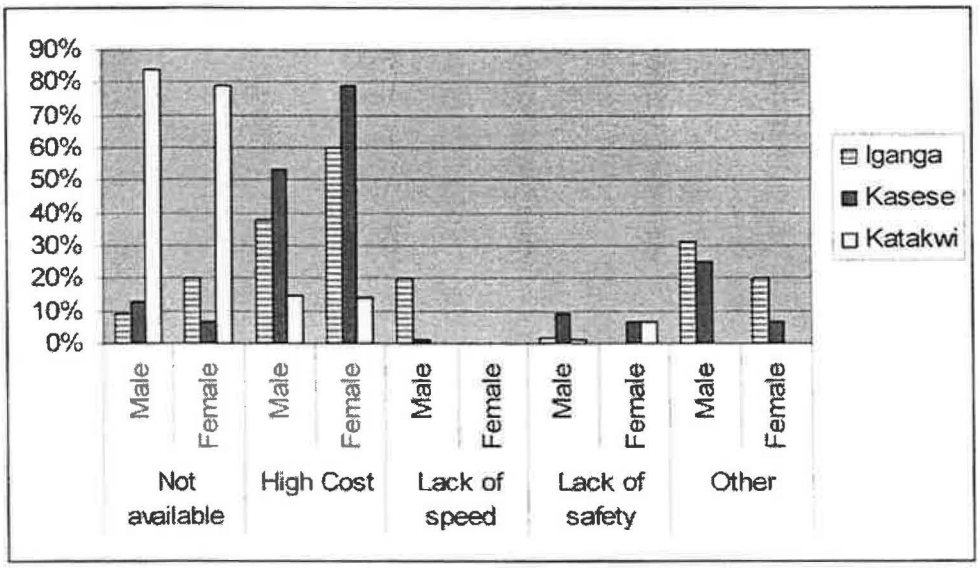


Figure A9: Household Travel and Transport Problems – 2nd Priority, by Gender of Respondent



NB: These figures should be taken with caution. Whilst in the cases of Iganga and Kasese, the respondents were in the majority (>85%) of cases the household head (and thus this represents their views – whether male or female), in the case of Katakwi – only roughly half of the respondents were household heads. Thus, in the case of Katakwi, these figures represent the views of other family members. However, it is noteworthy that 49% of the respondents in Katakwi were female.

Appendix 4: Methodologies Used in PRA

Methodology	Details
Transport Knowledge and Use (TKU) PRA	*Who:* whole group/ village meeting *Materials:* big cards, pens, beans *Time:* about 1-1.5 hours *Procedure:* A. Ask the amassed group to call out all the types of transport that they know of. Note each down on a separate card – in the local language (and below in english for our purpose) B. Give each person a few beans, and ask them to come up and place a bean on each form of transport that they used in the last 24 hours. Count up beans, count up total number of people. C. Repeat the exercise twice more: once for the type of transport used last month, once for the last year. Count up beans. On a A1 sheet list the types of transport and the total 'bean' count for last day, month, year. Feedback the most used and least used D. Get new cards. Take the first form of transport and ask the crowd the following question: (a) What is this transport mainly used for? Write down answers on cards and stick next to transport type (b) Who uses this transport? Write down on cards (c) Who doesn't use this transport? And why? Review all the answers, and feedback to crowd E. Write each type of transport on a separate card. Lay them out. Hand out one bean each. Ask everyone to come up and put a bean on the kind of transport they use the most. Count up and remove. Hand out another bean, and ask people to indicate which type of transport they use the second most. Count up both – write the results on a flip chart and feed back
Key Informant (KI) Discussion	*Who:* Village chief, CAO, LC1, elders, others identified with detailed knowledge and experience from the village *Materials:* Checklist, pen and paper *Time:* 1 hour+ *Procedure:* A. Open interview with small group or individuals B. Checklist questions: 2. Farming Systems Questions (see last section) 3. Village and regional infrastructure and services Questions

Seasonal Calendar	*Who:* Village chief, CAO, LC1, elders, others identified with detailed knowledge and experience from the village *Materials:* paper/ stick, beans *Time:* 20 minutes per calendar *Procedure:* A. Draw line on the floor (or paper) representing the last year. Say what the topic is (start with crop production then rainfall) and ask the scriber to mark when the events of importance. B. Ask them to place the number of beans representing intensity (e.g. rainfall, or harvest etc) Go through each topic like this – so should end up with two graphs. Investigate the linkages between them.
Daily Activity Profile	*Who:* selection of representative individuals (old women, old men, young women, young men) – indicative sample (say 2 from each category – total 8) *Materials:* stones, sticks, seed, beans, chalk or pen and paper *Time:* 20 mins each *Procedure:* A. Draw a line on the floor (or paper) symbolising the day. B. Ask for one to help scribe. Start with waking up, what they do, where they do it. If it is away from their previous location – ask how they got there- how long it took – if transport – what type & how much. Follow through the day, asking the volunteer to mark with different items the different activities
Transect Walk	*Who:* Team members (2) with village members who need (a) to be able to translate, and (b) know the village very well *Materials*: large piece of paper/ A4 notebook, pencil (as you will have to keep changing the proportions!) *Time:* depends on size of village – 1.5 to 3 hours *Procedure:* A. Identify the route for several teams to conduct the transect walks – go in pairs – preferably spanning out from a central point. Focus on discovering things that are new – or likely to be less obtainable through the other methodologies B. Identify physical features – topography, main crops and natural resources, roads, paths etc – can be used to confirm other supporting PRA info. Identify patterns- spread of housing, size of village. Informal discussions to learn about the history of the village

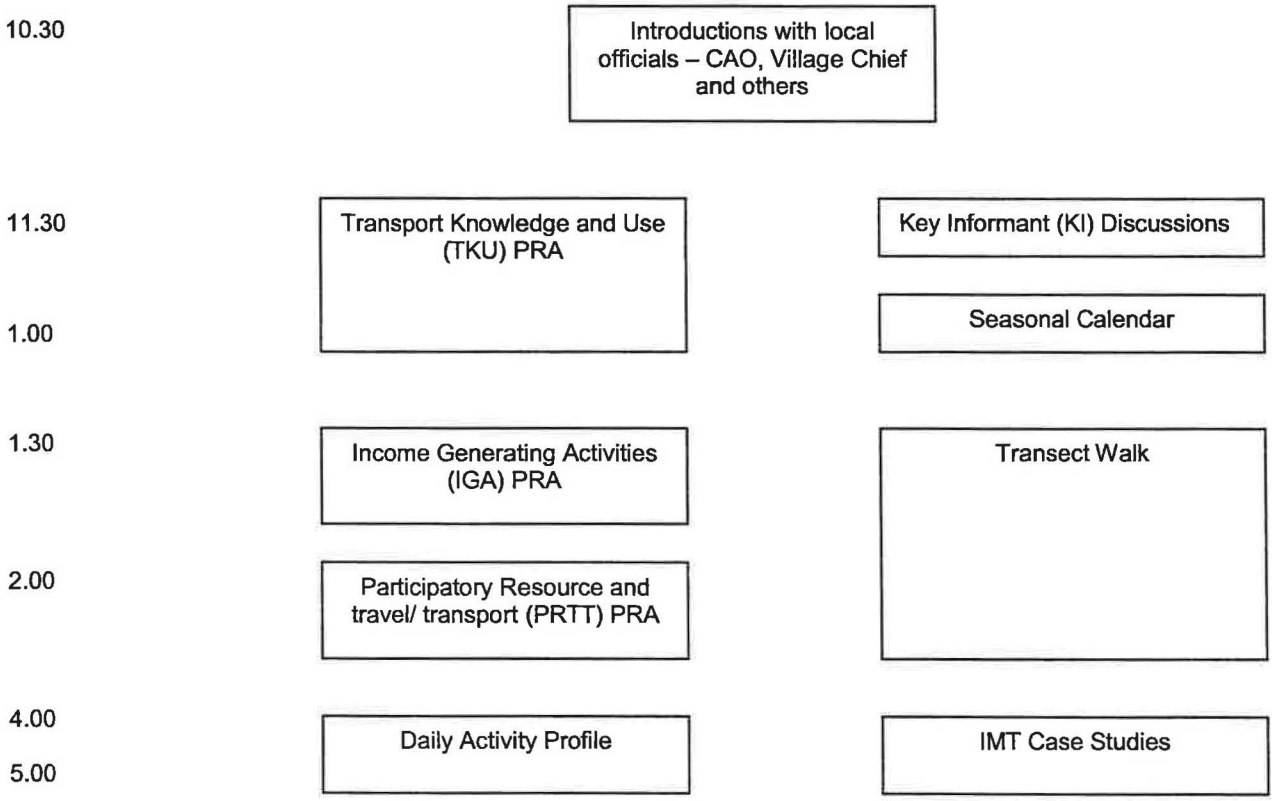
Income Generating Activities (IGA) PRA	*Who:* whole group/ village meeting *Materials:* big cards, pens, beans *Time*: about 20 minutes *Procedure*: A. Ask the group to volunteer a list of IGA activities conducted in the village. Write these down as they're called out on cards – in the local language and english. If people don't read too well- use icons B. Ask who in the group is involved in which activities. Separate these in groups *Example of categories of groups likely to be found:* - traditional processing of primary products (charcoal, beers, bark cloth etc) - trade in primary produce - retail trade in household goods, second-hand clothes, petrol - crafts such as carpentry, brick-making, construction of water tanks, pottery, basket-making and weaving, crochet, knitting, making brooms, baking, tailoring - services, including repairs and mechanics, preparation and sale of cooked food, running a bar, health care and midwifery, carrying water - waged or salaried work, in government or NGO service (in the village or in the district headquarters).
Participatory Resource and travel/ transport (PRTT) PRA	*Who:* each IGA group (or the main ones deemed relevant in IMT terms) *Materials:* small stick, sandy patch of ground, some stones (or big piece of paper and pens – better, but depends on appropriateness) *Time* 1-2 hours *Procedure:* A. Lead by asking people (with one scriber- the best drawer) to put on the main features, starting with where they are now. Best to start with biggest things – church, market etc followed by paths etc. B. Ask them to put on the key features of their activity – e.g. if brickmaking – where the materials are from, where they live, where they bake the bricks, where they get the water from etc. C. List each of the sources of activity/ resource on a piece of paper. Take one at a time. Asking: (a) how do you get there? (b) How often do you go there? (c) How long does it take? (d) If you use transport, do you pay, how much? D. Review each of these answers – checking consistency

IMT Case Studies	*Who:* selection of IMT owners – one by one *Materials*: checklist of questions, pen and paper *Time:* 30 minutes each *Procedure:* A. Take one IMT owner at a time (assuming different IMTs – if several people own the same, interview them together) B. Ask questions according to checklist (7. IMT ownership) – keep open and follow other lines of conversation if deemed relevant
Household Questionnaire	**See Appendix 5 for questionnaire**

Appendix 4.2 – Rapid PRA schedule

- One day per village
- Arrive at 10AM

Time	Activity	Length	Responsible
10.30-11am	Introductions with local officials – CAO, Village Chief and others	15-30mins	Whole Team (H, P, D, Cr, U, Ch)
11.30am-1pm	Transport Knowledge and Use (TKU) PRA	60-90mins	H, P, D
11.30am-12.30pm	Key Informant (KI) Discussions	60mins	Cr, Ch, U
12.30-1pm	Seasonal Calendar	30mins	Cr, Ch, U
1.30-2pm	Income Generating Activities (IGA) PRA	60mins	H, P, D
2pm-3.30pm	Participatory Resource and travel/ transport (PRTT) PRA	90mins	H, D, U
1.30-3.30pm	Transect Walk	120mins	Cr, P, Ch
4-5pm	Daily Activity Profile	60mins	H, D, U, P
4-5pm	IMT Case Studies	60mins	Ch, Cr



Appendix 5

Questionnaire Used for Household Livelihoods and Transport Survey

Improved Food Crops Marketing through Appropriate Transport for Poor Farmers in Uganda

Household Livelihoods and Transport Questionnaire Survey

Transport Forum Group (Uganda), in collaboration with Natural Resources Institute (UK), and Transport Research Laboratory (UK).

Name of interviewer _____

Date of interview _____

Interview start time _____

Date of revision _____

A. GENERAL INFORMATION

A1. District _____ No. [____]

A2. Sub-County _____ No. [____]

A3. Village _____ No. [____]

A4. Questionnaire Number _____

(Greeting). I am representing the Uganda Transport Forum Group, working on a project that aims to support the Government of Uganda's Programme for the Modernisation of Agriculture. We would very much like you to participate in this discussion, but your participation is entirely voluntary. The purpose of the questions are to help us, and therefore the government, to understand better your situation, so it can focus its support more carefully. All of the information from this conversation is entirely confidential- in no circumstances will your name be associated with the responses you give. Are you happy to participate?

B. HOUSEHOLD COMPOSITION

B1. Sex of interviewee [1] Male [2] Female

B2. Are you the head of the household? [1] Yes [2] No

B3. If no, what sex is the household head? [1] Male [2] Female

B4. What age is the household head? _____

B5. Which of the following is the household head? [1] Married [2] Single [3] Widowed [4] Separated [5] Divorced

B6. How many male adults live in this house (including HH Head)**?** _____

B7. How many female adults live in this house (includ. HH Head)**?** _____

B8 How many male children live in this house (less than 19yrs)**?** _____

B9 How many female children live in this house (less than 19yrs)**?** _____

B10. How many members of the family are currently in school (primary and secondary)**?** _____

B11. How many years have you lived in this district? _____

B12. If you moved to this district, where did you live before? _____

District [_____] Village [_____] Interview No. [_____]

C. GOODS, PROPERTY AND HOUSEHOLD EXPENDITURE

TRANSPORT

[C1] Type of transport	[C2] How many does your household own?	[C3] Where did you purchase it/ them?	[C4] Who owns it/ them? 1=Man 2=Woman
1. Donkey			
2. Donkey-cart			
3. Oxen			
4. Ox-cart			
5. Bicycle			
6. Bicycle-trailer			
7. Wheel-barrow			
8. Tractor and trailer			
9. Car			
10. Pick-up truck			
11. Other _____			
OTHER GOODS			
12. Radio			
13. Paraffin Lamp			
14. Production equipment (hoe, panga, etc)			
15. Ox plough			

PROPERTY

C5. Including all of your crops, how many gardens/ fields did you and your family cultivate during the last 12 months? _____

C6. Please estimate the total acreage of your cultivated area during the last 12 months? _____

HOUSEHOLD EXPENDITURE

Which of the following expenditures have you made over the last 6 months?

C7. School fees/ equipment	[1] Yes	[2] No	**C10. New clothes**	[1] Yes	[2] No
C8. Hospital/ clinic fees	[1] Yes	[2] No	**C11. Production inputs**	[1] Yes	[2] No
C9. Second-hand clothes	[1] Yes	[2] No	**C12. Labour**	[1] Yes	[2] No

D. DOMESTIC AND SERVICE TRANSPORT USE

[D1] Transport Use	[D2] Number of trips made in this period?	**Modes of transport used, and the time taken for a return trip for this purpose** (minutes). Key for transport modes: 1=on foot 2=wheelbarrow 3=bicycle, 4=bicycle-trailer, 5=ox-cart, 6=donkey, 7=donkey-cart, 8=tractor-trailor, 9=power tiller, 10=pick-up, 11=lorry, 12=taxi, 13=bus.					
Domestic		**[D3_1] Most used mode**	**[D3_2] Time taken**	**[D3_3] Cost** shillings	**[D4_1] Second most used**	**[D4_2] Time taken**	**[D4_3] Cost** shillings
1. Water carriage	[per day]						
2. Wood collection	[per day]						
3. Buying consumer goods	[per month]						
Services							
4. Healthcare	[per month]						
5. Education							
6. Social reasons	[per month]						

District [____] Village [____] Interview No. [____]

E. AGRICULTURAL PRODUCTION DURING THE LAST 12 MONTHS

[E1] Crop	[E2] Have you planted this crop? 1=Yes 2=No	[E3] Who is responsible for planting this crop? 1=Man 2=Woman 3=Both	[E4] Where did you store this crop? 1=home 2=village store 3=private company store 4=other	[E5] How did you transport your crop to the store? 1=on foot 2=wheelbarrow 3=bicycle, 4=bicycle-trailer 5=ox-cart, 6=donkey, 7=donkey-cart, 8=tractor-trailor, 9=power tiller, 10=Pick-up truck, 11=Lorry, 12=Taxi, 13. Bus	[E6] How long does it take to transport your crop to the store by the transport you used (minutes)	[E7] If you had to pay for this transportation, how much did it cost per load? (Shillings)
1. Maize						
2. Rice						
4. Cassava						
5. Bean						
6. Sweet Potato						
7. Groundnut						
8. Banana						
9.. Irish Potato						
10. Pineapple						
11. Passion fruit						
12. Coffee						
13. Sugar Cane						
14. Cotton						
15. Other (major)						

E. (continued) AGRICULTURAL MARKETING DURING THE LAST 12 MONTHS

[E1] Crop	[E8] How many kgs did you sell?	[E9] Who is responsible for selling this crop? 1=Man 2=Woman 3=Both	[E10] Where did you sell the majority of your crop? 1=from home 2=village market 3=district market 4=village store 5=private store 6=other	[E11] To whom did you sell the majority? 1=village agent 2=non-local trader 3=group 4=private company 5=neighbour 6=Press owner 7=other	[E12] Why did you sell to this buyer? 1=only buyer known, 2=always sell to this person, 3=he offers a better price 4=he provides inputs 5=lack of transportation 6=can't wait any longer E12_1	E12_2	[E13] If you sold your crops at market, what transport did you use? *(see code list from E6 above)*	[E14] How long did it take to transport your crop to the market by the transport you used (minutes)	[E15] If you pay for this transportation how much did it cost per load? Shillings
1. Maize									
2. Rice									
4. Cassava									
5. Bean									
6. Sweet Potato									
7. Groundnut									
8. Banana									
9.. Irish Potato									
10. Pineapple									
11. Passion fruit									
12. Coffee									
13. Sugar Cane									
14. Cotton									
15. Other (major)									

District [_____] Village [_____] Interview No. [_____]

[E16] How many kilometres is your main market? _____

[E17] How many months of the year do you <u>not</u> have access to the nearest market using transport (e.g. bicycle, motorcycle, pick-up)? _____

F. USE OF AND ACCESS TO INPUTS

[F1] Inputs	[F2] Use? 1=Yes 2=No	[F3] Where do you get these inputs? 1=local market 2=family/friends 3=NGO 4=Government 5=private company 6=other	If you travel to purchase inputs... Modes of transport used, and the time taken for a return trip for this purpose (minutes). Key for transport modes: 1=on foot 2=wheelbarrow 3=bicycle, 4=bicycle-trailer, 5=ox-cart, 6=donkey, 7=donkey-cart, 8=tractor-trailor, 9=power tiller, 10=pick-up, 11=lorry, 12=taxi, 13=bus.					
			[F4_1] Most used mode	[F4_2] Time taken	[F4_3] Cost shillings	[F5_1] Second most used	[F5_2] Time taken	[F5_3] Cost shillings
1. Purchased seed								
2. Fertilisers								
3. Insecticides/ Herbicides								
4. Production equipment (hoes, panga, etc)								

G. LIVESTOCK OWNERSHIP

[G1] Type	[G2] How many?	[G1] Type	[G2] How many?
1. Ox		**5. Pig**	
2. Donkey		**6. Goat**	
3. Horse		**7. Sheep**	
4. Cow/ Bull		**8. Poultry**	

H. OCCUPATION/ INCOME-GENERATING ACTIVITIES (IGAs)

[H1] Occupation/ Income Generating Activity	[H2] Primary Occupation of household head? (tick <u>one only</u>)	[H3] Other IGAs of household head? (tick as many as are appropriate)	[H4] IGAs of other household members? (tick as many as are appropriate)	[H5] How much travel does this activity involve per month?		[H6] What form of transport do you use? (use code list from F4 above)	[H7] If you have to pay for this transport, how much is it? (Shillings)
				[H5_1] No. of days per week?	[H5_2] No. of hours per day?		
1. Farming – <u>Sale of crops</u>				Covered in Section E			
2. Farming – <u>Sale of animal produce</u>							
3. Traditional processing of primary products (charcoal, beers etc)							
4. Trade in primary produce							
5. Retail trade (in household goods, second-hand clothes, petrol, etc)							
6. Crafts (carpentry, brick-making, pottery, basket-making, tailoring)							
7. Services (including mechanics, preparation and sale of cooked food, running a bar, health care and midwifery, carrying water)							
8. Waged or salaried work (in government or NGO service, in the village or in the district headquarters).							

I. HOUSEHOLD TRAVEL AND TRANSPORT PRIORITIES		J. HOUSEHOLD TRAVEL AND TRANSPORT PROBLEMS	
[I1] JOURNEY	**[I2] Please indicate the 3 most important journeys that you make - in order of preference** 1=most important 2=second most 3=third most	**[J1] PROBLEM**	**[J2] If you do not used transport** (e.g. bicycle, m-cycle, pick-up etc)**, please indicate two main reasons why – in order of preference** 1=most important 2=second most
1. Crop transport – home to farm to store		**1. Not available**	
2. Crop transport – store to market		**2. High cost**	
3. Transport of water		**3. Lack of speed**	
4. Fuelwood transport		**4. Lack of safety**	
5. Transport of Agricultural inputs		**5. Other _____**	
6. Travel to work (profession)			
7. Transport for other IGAs			
8. Travel to clinic			
9. Travel to school			
10. Travel for social reasons (weddings, funerals, family visits)			
11. Other _____			

K. MEMBERSHIP/ LINKAGES

Are you, or is anyone in your family, a member of the following?

K1. Crop production/ marketing group	[1] Yes	[2] No
K2. Credit group	[1] Yes	[2] No
K3. Income Generating Activity Group (e.g. brickmaking, carpentry, handicrafts)	[1] Yes	[2] No
K4. Boda-Boda group	[1] Yes	[2] No

Have you, or any member of your family, ever received support from the following:

K5. Community-Based Organisation	[1] Yes	[2] No
K6. Non-Governmental Organisation	[1] Yes	[2] No
K7. Government Extension Services	[1] Yes	[2] No
K8. Private Company (input supply etc)	[1] Yes	[2] No

END OF INTERVIEW **[End Time_____]**

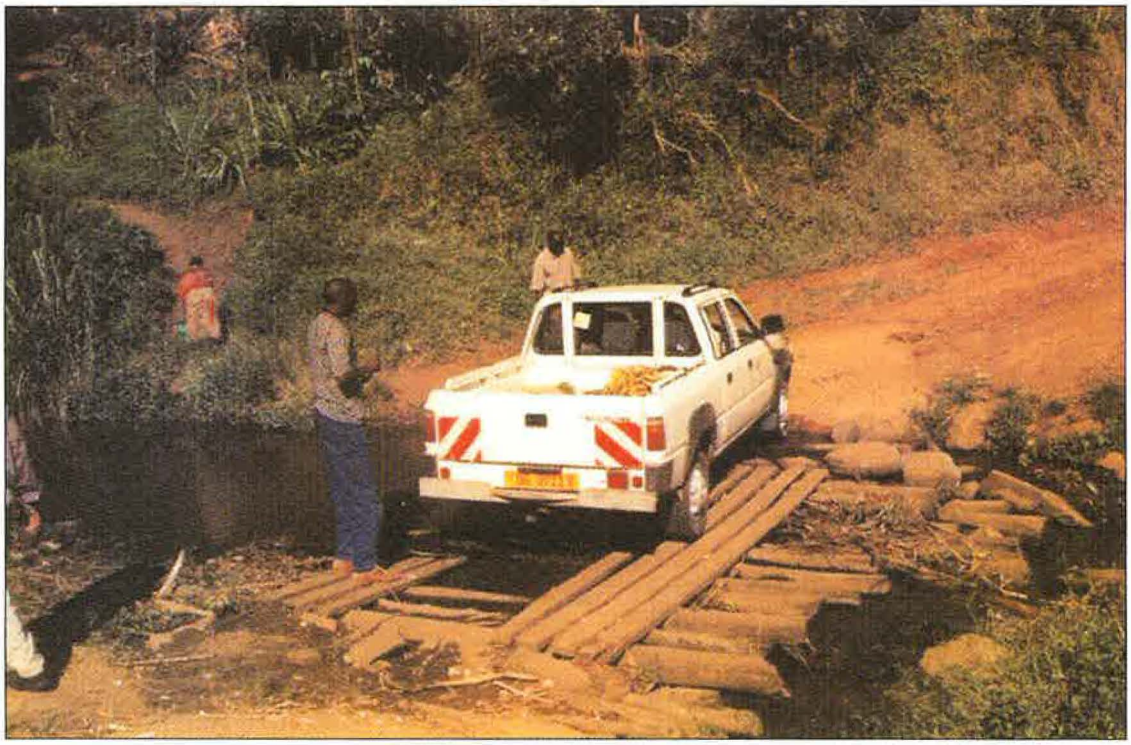
Please thank the interviewee for the time and information given

Appendix 6

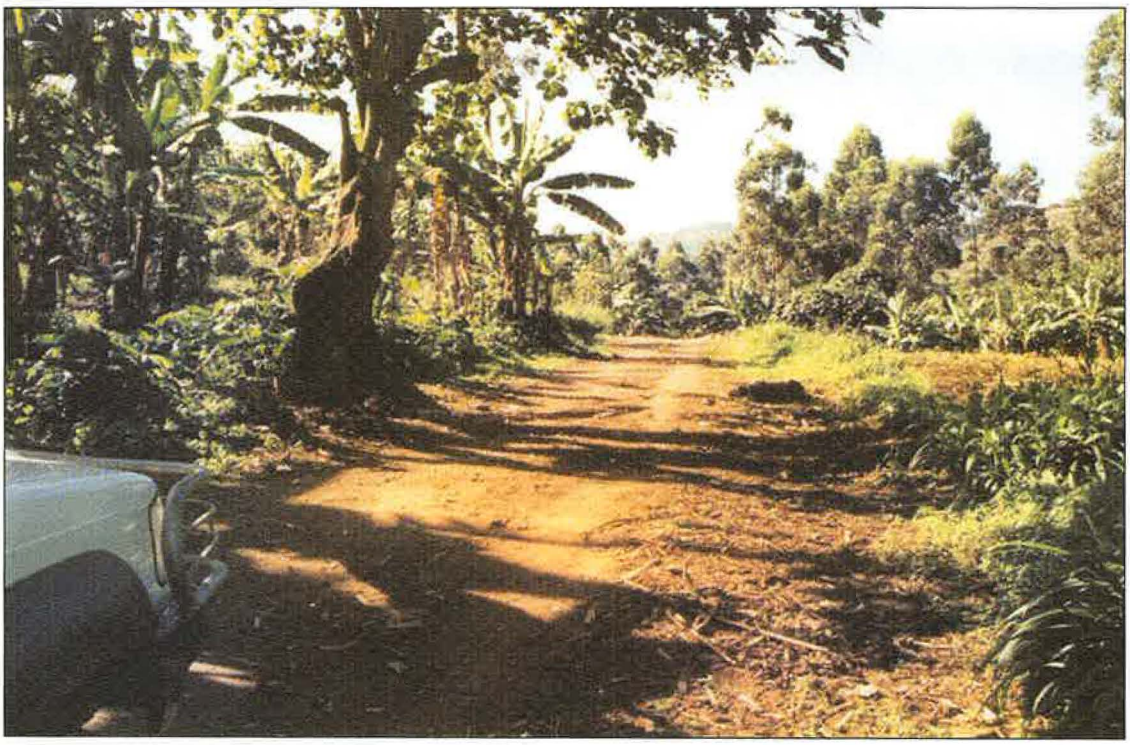
Selected photographs taken during the course of the PRA; courtesy of Christian Dunkerley (also cover page photograph), David O'Neill, and David Smith

Latest YWAM (donkey) cart design.

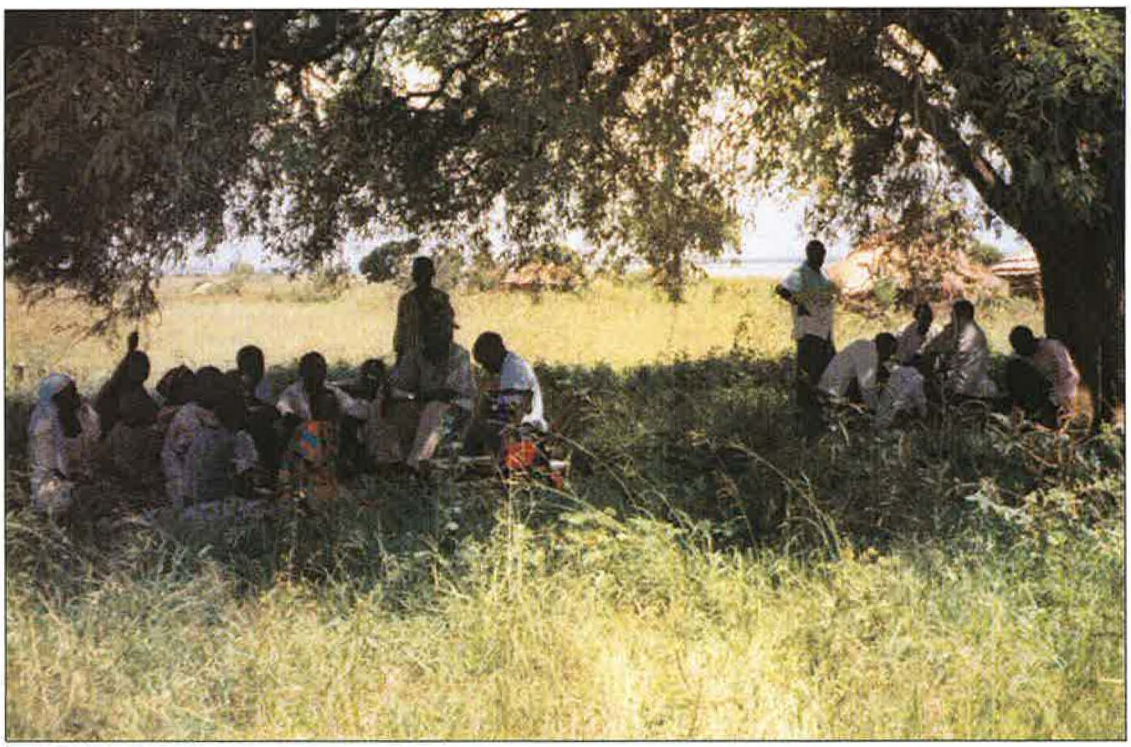
YWAM cart design.



Stream crossing in Kasese District. Most of these crossings are rudimentary and although they can barely support IMTs, vehicles are likely to use them and probably cause some damage.



Road in Kasese District. Most roads in Iganga, Kasese and Katakwi District are unsealed, like this one.



PRA exercise in Katakwi District.

PRA exercise in Iganga District.