

**NATURAL RESOURCES INSTITUTE, UK
In Collaboration with
TRANSPORT FORUM GROUP, UGANDA
&
TRANSPORT RESEARCH LABORATORY, UK**

**Kick-Start Workshop On Improved Food Crops
Marketing Through Appropriate Transport For
Poor Farmers In Uganda**

Sunset Hotel & Conference Centre, Jinja, Uganda 27-29th May 2002

By

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- Appendix 4 Transport Research Laboratory Inputs By Mr. M. Benmaamar, TRL, UK
- Appendix 5 Ergonomics by Mr. D. O'Neill, Silsoe Research Institute, UK.

Abbreviations

AEATRI	Agricultural Engineering and Applied Technology Research Institute
ART	Agricultural Rural Transport
ATNESA	Animal Traction Network for Eastern and Southern Africa
CBOs	Community base organisations
DAP	Draught animal power
DFID	United Kingdom Department for International Development
DAPCWI	Draught Animal Power Community Welfare Initiative
FABIO	First Africa Bicycle Information Office
FOKAPAWA	Forum for Kalongo Parish Women Association
IFRTD	Forum for Rural Transport and Development
IMTs	Intermediate Means of Transport
ITDG	Intermediate Transport Development Group
KADEFO	Sustainable Agriculture Network
KENDAT	Kenya Network for Draft Animal Technology
KICDI	Kangai Integrated Community Development Initiative
KPIU)	Karamoja Project Implementation Unit
NARO	National Agricultural Research Organisation
NFG	National Forum Group
NGOs	Non-government Organisations
NRIL	Natural Resources International Ltd
NRI	Natural Resources Institute
NRRD	Natural Resources Research & Development
PACODEF	Poverty Alleviation and Community Development Foundation
PMA	Modernization of Agriculture
PRA	Participatory Rural Appraisal
RTS	Rural Transport Services
RTTP	Rural Travel and Transport Programme
SAARI	Serere Agricultural and Animal Production Research Institute
SIDA	Swedish International Development Agency
SLU	Swedish University of Agricultural Sciences
SSATP	Sub-Saharan Africa Transport Program
TFG	Transport Forum Group
TRAP	Technology for Rural Animal Power
TRL	Transport Research Laboratory Inputs
UNATCA	Uganda Network for Animal Traction and Conservation Agriculture
UNFFE	Uganda National Farmers Federation
USAID	United States Agency for International Development
WFP	World Food Programme
YARFEW	Youth Action For the Renewal of Firewood Energies and National Wells
YWAM	Youth with A Mission Katakwi Design Centre

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1.0 INTRODUCTION

The United Kingdom Department for International Development (DFID) Crop Post-Harvest Programme started to fund the first phase of the project on “Improved Food Crops Marketing Through Appropriate Transport for Poor Farmers in Uganda” in April 2002. Subject to the results of a review by March 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:

- a) Baseline study,
- b) Validated technology for IMTs,
- c) 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. Their uptake will lead to an improvement of poor farmers’ livelihoods.

The main activities of the project are to be carried out in three phases as follows:

Phase 1 (12 months)

- a) Assisting NFG in installing a project office
- b) Workshop to kick off project
- c) Baseline study

Phase 2 (21 months)

- d) Workshop to present findings of baseline study and plan activities for phase 2 of the project.
- e) Participatory action-research activities to test and validate selected means of transportation. This also involves two Participatory Rural Appraisals (PRAs) and one statistical survey.

Phase 3 (3 months)

- d) Workshop to present research results
- e) Dissemination and publication activities

2.0 KICK-START WORKSHOP

The **Kick-Start Workshop** was held 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.

2.1 Objectives of Kick-Start Workshop

The specific objectives of the Kick-Start Workshop were to:

- a) Involve key stakeholders and all members of the core team in planning the baseline study
- b) Brief the stakeholders on the research background, objectives, activities and outputs
- c) Brainstorm on research site selection (district, community, project)
- d) Review the research methodology, instruments & Intermediate Means of Transport (IMTs) for testing and monitoring among poor rural farmers
- e) Work out collaboration arrangements with stakeholders for production, testing, distributing and monitoring of IMTs for poor rural farmers
- f) Share experiences on rural transport and exploring possibilities for networking

2.2 Workshop Programme

The workshop was held for a period of two days at the Sunset Hotel International in Jinja. The complete workshop programme is presented in **Appendix 1**. Mr. Kwamusi, the Chairman of the Uganda Forum Group, opened the workshop by welcoming all participants to Jinja, and emphasized the need for collaborative research between international and local institutions that can lead to capacity building for the local researchers. Ms. Agnes Nayiga, the representative of Dr. Dan Kisauzi, the Regional Coordinator, DFID East Africa Natural Resources, closed the workshop. She took the opportunity to brief the participants on the Crop Harvest Programme and advised the research team to make an elaborate literature review in order to capture information from past and ongoing research projects funded by DFID such as those by Serere Agricultural and Animal Production Research Institute (SAARI) and Agricultural Engineering and Applied Technology Research Institute (AEATRI).

2.3 Participation at the Workshop

The stakeholders came from a wide range of interests covering policy makers, funding agency, farmers, NGOs in agricultural production, draught animal power, IMT production, women groups, and micro-finance, and research institutions. A total of 21 participants attended the workshop representing the following stakeholder interests:

Stakeholder Interest	Number
Researchers:	
a) Natural Resources Institute	1
b) Transport Forum Group	3
c) Transport Research Laboratory Ltd	1
d) Kenya Network for Draught Animal Technology (KENDAT)	1
International Collaborator Institutions:	
e) International Forum for Rural Transport and Development	1
Funding Agency:	
f) DFID East African (DFIDEA), Natural Resources Research & Development Coordination Office; (NRRD)	1
Government Collaborator Institutions:	
g) Office of the President	1
h) Plan For Modernization of Agriculture (PMA) Secretariat	1
i) Serere Agricultural and Animal Production Research Institute SAARI, Draught Animal Power (DAP)	1
j) Karamoja Project Implementation Unit (KPIU)	1
Potential Collaborator NGOs:	
j) Uganda National Farmers Federation (UNFFE)	1
k) First Africa Bicycle Information Office (FABIO)	1
l) Poverty Alleviation and Community Development Foundation (PACODEF)	1
m) Design Centre, Youth with A Mission Katakwi	1
n) Technology for Rural Animal Power (TRAP)	1
o) KULIKA Charitable Trust Uganda	1
p) Youth Action For The Renewal of Firewood Energies and National Wells (YARFEW) in Uganda	1
q) Forum For Kalongo Parish Women Association (FOKAPAWA)	1
r) Draught Animal Power Community Welfare Initiative (DAPCWI) Project	1
s) Kangai Integrated Community Development Initiative (KICDI)	1

The list of participants with addresses including telephone, fax and e-mail are attached as **Appendix 2**.

2.4 Workshop Methodology

The two-day workshop consisted of plenary sessions and group discussions (**Appendix 1**). At plenary sessions papers were presented followed by discussions and brainstorming whenever necessary. The groups reported back to plenary and after discussions group reports were adopted with amendments.

3.0 BRIEF ON THE RESEARCH PROJECT

The Team Leader presented a paper on the research background, objectives, activities and the outputs. The presentation was aimed at bringing those participants who were not involved in the design of the research project on board. The full paper is attached as **Appendix 3**.

3.1 Research Background

Through research the lack of appropriate means of transportation in rural areas is a recognised fact in many countries of Sub-Saharan Africa. In particular, women bear the bulk of the burden (i.e. head loading) when it comes to activities such as transport of food crops to and from markets, and collection of water or fuel wood. Most of the agricultural produce is taken to markets through head loading by women and children. Although animal draught power technology has existed in Uganda since the early 20th Century, ox-carts and donkey carts are rarely used due to a number of reasons.

Means of transportation were identified as a major constraint to agricultural marketing during the course of a CPHP funded research project entitled “Community access to marketing opportunities”, which was carried out in Uganda between October 1998 and March 1999 by NRI in collaboration with the Agricultural Policy Secretariat (Kleih *et. al.* 1999). In particular, the need for improved rural transport was expressed by farmers consulted as part of this research and at District level workshops.

The need for appropriate rural transport was extensively analysed at a DFID sponsored East Africa workshop organised in 1997 by the Kenya Network for Draught Animal Technology (KENEDAT) in collaboration with Silsoe Research Institute and other organisations.

The World Bank and other development partners recognised the need for improved rural transport under the Sub-Saharan Africa Transport Program (SSATP). This gave birth to the Rural Travel and Transport Programme (RTTP), which has been taken up in numerous countries of Sub-Saharan Africa. It is expected that this research will feed into the RTTP in Uganda.

The project will improve the knowledge on means of transportation ultimately leading to improved decision-making in public and private organisations. Particular emphasis will be placed on up-take of intermediate means of transportation and how this can be improved.

The project, which will be conducted in three phases began from April 2002 and will end in March 2005, although funding for the first phase only had been assured.

3.2 Research Objectives

The project’s main objective is to identify which means of transportation are appropriate in different parts of rural Uganda, and to promote the resulting recommendations.

3.3 Research Activities

The main activities consist of baseline studies, action-research activities to test and validate Intermediate Means of Transportation (IMTs), and dissemination of results. Issues to be addressed include: transport needs in the agricultural marketing system, transport economics, aspects of mechanical engineering and ergonomics, community access roads, up-take of means of transportation and constraints to it.

In addition the project will assist the Transport Forum Group to install a project office, support exchange visits for farmers to Kenya, train blacksmiths and workshop owners and lastly distribute selected IMTs at village level.

The project activities are to take place in three districts although links with other districts where there is a demand for IMTs by poor farmers will be ensured.

3.4 Research Outputs

The project outputs include a baseline study, validated means of transportation and promotional material. The target audiences for project outputs include decision makers in ministries and local government institutions, the National Agricultural Research Organisation (NARO) and its research institutes, NGOs, networks such as IFRTD and Animal Traction Network for Eastern and Southern Africa (ATNESA), Uganda Network for Animal Traction and Conservation agriculture (UNATCA), private sector companies dealing in rural transport and members of the donor community in Uganda and other regions.

3.5 The Research Team

Participants were informed that a consortium of researchers led by the Natural Resources Institute in collaboration with the Transport Forum Group of Uganda and the Transport Research Laboratory Ltd would carry out this research project. Staff from Uganda government organization such as the Plan for Modernization of Agriculture (PMA) Secretariat, Agricultural Engineering and Applied Technology Research Institute (AEATRI), and Serere Agricultural and Animal Production Research Institute (SAARI) among others will be involved at both the field and policy level. Involvement of NGOs in IMTs production, distribution and testing will be sought. There will be collaboration with similar projects in Kenya and Ghana. KENDAT will provide an IMT specialist and an Ergonomist from Silsoe Research Institute.

Issues arising out of discussions

- a) Crop marketing is a problem in Uganda and needs to be addressed.
- b) Farmers are practicing economists who have to be enticed to adopt improved crop marketing through using appropriate transport. Towards this end, the Updated Road Sector Development Programme (2002-2011) which covers the community roads through the District, Urban, and Community Access Roads (DUCAR) component will ease access to communities for evacuation of agricultural produce. It was noted that 50% of farmers own bicycles but do not use them for marketing produce and only use them for pleasure rides and going to funerals and other related social activities. It was also pointed out that most of the ox-carts are metallic and if one breaks down, a farmer abandons it because he cannot repair it. This is one of the major reasons why ox-carts have not been successful in Teso.
- c) Involvement of farmers in projects should be carried out because if this is not done then there is a high rate of failure. An example of the extension services was cited. It was noted that farmers' attitudes should not be changed but it is the technocrats who have to change their attitudes first before changing those of farmers.
- d) There is an information gap between government and NGOs. Consequently, if any project is to succeed, a baseline study has to be carried out because in this way NGOs can be incorporated and

not left out of activities. It is also very important to consult elders at the onset of a project so as to ensure community ownership and participation

4.0 PLANNING THE BASELINE STUDY

Through plenary discussions after paper presentations, brainstorming exercises and group discussions, the participants were fully involved in the planning of the Baseline Study. Details are elaborated in the following sections.

4.1 Baseline Study Objective

The objective of the baseline study is to assess the farming system and the need for rural transport, including the role of intermediate means of transportation, constraints to up-take, and potential implications for agricultural production and marketing. The fieldwork for the baseline study will be designed so that it allows a comparison of the situation before and after the introduction of selected means of transportation.

4.2 Research Site Selection By Dr. Charles Kaira, Local Project Coordinator, Transport Group Forum.

Dr. Kaira elaborated on the criteria to be used in selecting three districts for research sites. The criteria included but 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.

Dr. Kaira requested participants to provide other criteria necessary in assisting in site selection and the following were added:

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

A total of sixteen districts were nominated by participants based on the farming condition/system as shown in the table below.

Teso Farming System	Lango Farming System	Mountainous Farming System	Banana Farming System
Lira	Pader	Rukungiri	Kibaale
Katakwi	Kitgum	Kapchorwa	Mpigi
Kumi	Gulu	Kasese	Iganga
Soroti		Kamwenge	
Tororo		Bundibugyo	

After lengthy discussions, a select committee of four participants streamlined the cluster of districts to only eight districts namely: Katakwi, Kumi, Soroti, Tororo, Pader, Kapchorwa, Kasese and Kamwenge. These districts fall within three farming systems namely Teso, Lango and mountainous areas and were selected on the basis of being able to serve as control, providing virgin ground and having terrain which

favours use of IMTs. Then the participants were requested to award points to each district clustered according to the farming system criterion using the other three criteria as shown in the table below.

Selecting districts for research sites

Districts clustered according to Criterion (1)	Criterion (2) ^a Points (0-5)	Criterion (3) Points (0-5)	Criterion (4) (Points (0-5))	Total
Teso Farming System				
Lira	2	3	3	7
Katakwi	4.5	5	5	15
Kumi	3	3	4	10
Soroti	1.5	3	4	8.5
Tororo	1	3.5	3	7.5
Lango Farming System				
Pader	5	5	5	15
Mountainous System				
Kasese	5	4.5	5	14.5
Kamwenge	4	3	3	10

^a Criterion (1): Farming system

Criterion (2): Relative potential demand for IMTs by poor rural farmers

Criterion (3): On going projects that require IMTs to enhance their socio-economic impacts, poverty eradication and sustainability

Criterion (4): Adequate local collaborative capacity to allow for cost-effective monitoring over the research period

The three districts that scored better than others in their category and therefore selected as research sites were Katakwi for the Soroti farming system, Pader for the Lango farming system and Kasese for the mountainous farming system. The participants observed that:

- a) In Katakwi, there are a number of NGOs such as Action Aid, TRAP and YWAM, which are involved in IMTs projects and the demand for IMTs is high including their production.
- b) In Pader, there are many on-going projects carried out by AVIS, World Food Programme (WFP), United States Agency for International Development (USAID), FOKAPAWA, World Vision and OXFAM. Yet none of these projects deals in transport. Also, there are strong women organizations available at various levels having potential to monitor the project.
- c) For Kasese, there is a strong network of NGOs such as Sustainable Agriculture Network, KADEFO and others, which will ably provide effective monitoring. In addition, there are projects dealing in IMTs especially donkeys.

4.3 Baseline Fieldwork

Mr Kleih informed the participants that the fieldwork for the baseline study would start in mid-September 2002 for three weeks. The Transport Forum Group local Project Coordinator will lead the survey. It is envisaged to use a combination of participatory and quantitative survey techniques in three Districts representing different farming conditions of Uganda.

4.3.1 Participatory Rural Appraisal (PRA)

The fieldwork will start with a **Participatory Rural Appraisal (PRA)** to be undertaken by a team of researchers including a sociologist, marketing specialist, gender specialist, an economist and engineering specialist, a PMA representative, and local contact persons from District Administration Offices and NGOs. In the initial phases of the PRA, training of collaborators and testing of techniques would be done. Sustainable livelihoods approach will be used on key aspects such as human, social, natural, physical resources including trends (market prices) and shocks (drought). The hypotheses to be tested will be based on the findings of the PRA.

4.3.2 Questionnaire Survey

A Questionnaire Survey in the same Districts where the PRA has taken place will follow the PRA. Given that the latter will have covered the majority of qualitative questions, it is envisaged that the statistical survey will be highly focused. It is envisaged that 300-400 households will be interviewed (15 households in 8 villages in 3 Districts each) to get more details on household assets, farm production, crop marketing, IMT use, income, and food security. In each District, villages will be stratified according to criteria such as remoteness and farming potential. Random sampling of households will take place in the villages themselves.

In order to assess the most appropriate transport interventions to assist with food crop marketing in the project area it will be important to understand the main characteristics of both the rural transport system and the pattern of agricultural marketing.

Consequently, information will be collected on how goods are transported from house to field, field to house, house to market and field to market. Data would be collected on the types of load, load sizes, load perishability, trip distances, trip frequencies, together with information on the types of transport used, their respective frequencies, their hire charges and their main cost characteristics. Estimates would be made of the total load moved per household and per village for the main harvest seasons and the scope for consolidating loads at particular times and locations.

Information would also be collected on how transport relates to the marketing system such as:

- Where are crops currently sold (on farm, at house, village market, urban market)?
- Who are the major purchasers, are they wholesalers, retailers or consumers.
- Who pays for storage and transport?
- What are the typical costs and revenues involved in each stage of the marketing process?
- Are there key constraints on changes in marketing patterns such as credit relationships between wholesalers and farmers?
- Can farmers easily sell crops directly in urban markets?
- The nature of the organisation of transport services would be assessed: Are local transport cartels operating and how are transport fares and tariffs set? Are farmers (with small loads) at a particular disadvantage?
- The types of transport most suited to the local situation would be assessed. Are paths, tracks, and roads suitable for the different forms of transport?
- Can small-scale measures be taken to improve and increase the types of transport?
- Is animal transport suitable, and do people have experience of work animals?
- Is tsetse-fly a problem?
- Is animal feed and fodder freely available or is it purchased at certain times in the year?
- What mechanical experience and skills are locally available?

The identification of key technical, economic, social/cultural, credit facilities and infrastructure constraints will also be dealt with.

4.3.3 Discussions on Baseline Fieldwork

Contributing to the discussion on the fieldwork baseline study methodology, participants identified the following checklist issues for the fieldwork study:

Agricultural Rural Transport Services

- Inventory of different means of intermediate modes of transport.
- Assessment of manufacturing capacity
- Cultural relationship to the use of IMTs
- Levels of utilization & management of existing IMTs
- Cost-benefit analysis of the utilization of IMTs
- Existing and potential use of IMTs
- Sources of information for IMTs
- Previous attempts to introduce IMTs: failures & successes
- Use of IMTs by people with disabilities
- Role of children in using IMTs by age groups
- Types of draught animals used for transport
- Affordability & credit facilities for acquisition of IMTs
- IMT accessibility vs ownership
- Sustainability of rural transport services in general and IMTs in particular
- Role of youths in relation to IMTs and income generating activities
- Influence of topography and terrain including distance with regard to use of IMTs
- Level of indigenous knowledge about IMTs & practices
- Awareness and support for (IMTs) by local authorities
- IMTs per household, ownership & use
- No of existing projects promoting IMTs.
- Security / Safety for IMT use
- The role of IMT in rural development
- Number of artisans engaged in IMTs including level of efficiency, number of workshops for service and spare parts
- Availability of training facilities
- Gender issues in agricultural production and use of IMTs
- Ergonomics
- State of infrastructure (roads, tracks & paths including stream crossings)

Marketing of Crops

- Types of crops plus level of production in the area
- Structure of marketing system
- Distances from and to markets
- Population & ownership of the assets

4.4 IMT Testing & Monitoring

Mr. Kleih informed the participants that IMTs that are already well known in the region such as ox-carts or donkey- carts would be introduced on a small scale into selected farming communities. This is in order to gain time for testing and validating means of transportation. On the other hand, it is acknowledged that other IMTs, which do not exist in Uganda as yet, such as certain types of Asian utility-vehicle, will need to be tested prior to dissemination. Funds are available to test the IMTs in selected villages. Indicators to be monitored for IMTs at household level include:

- Level of use
- For hire or own use
- Credit facilities for acquisition
- Incentives for users
- Maintenance costs
- Safety issues
- Sustainability
- Design/ergonomics issues including the lessons from other projects in Busitema, Tororo Nalweyo, Kitgum

Mr. Kleih emphasized the need for a strong link with the NGOs to equipment production, supply and maintenance chains. Testing of selected IMTs will start in December 2002.

4.5 Training of Artisans

Phase 1 of the Project has funds for training of artisans for IMTs. During the PRA field exercise, the team will identify artisans to be trained for particular IMTs mainly carts. The Triple W. Engineering Ltd facility in Kenya has opportunities for training artisans in production and maintenance activities. The modules run for periods of up to three months. Also, SAIMMCO Ltd in Soroti, manufacturers of farm and animal traction equipment including carts, will be requested to train some artisan from the research districts. Placing of artisans for training will start in November 2002.

5.0 GROUP DISCUSSIONS TO GAIN INSIGHT ON IMT USE IN UGANDA

In order to gain insight in the level of use of IMTs in Uganda, participants were divided into two groups and requested to discuss in detail issues related to use of IMTs in Uganda. The Groups and issues for discussion were as follows:

Discussion Group

Manufacturers:

1. B. Wanzira
2. T. L. Ayolo
3. P. Kayemba
4. G. Etongu
5. S. Olido
6. D. Wekesa
7. P. Obuo
8. J. Mugagga

Facilitator: Kleih

Users:

1. Dr. J.J Otim
2. V Oyela
3. A. Nayiga
4. J. Mulumba
5. P. Kwamusi
6. A.M. Moki
7. H. Iga

Facilitator – Benmaamar

Issues Discussed

- Approximate number of IMTs used in their respective areas
- Their manufacturing capacity.
- How many carts or other implements have they manufactured, over what period? Includes oxen / donkeys trained.
- Their main constraints, and suggestions on how to overcome them; should be related to their business!
- Means of transportation used in their areas
 - Around the village
 - Long – distance
- What would be the main purpose of IMTs in their respective area?
- Constraints to up-take of IMTs and suggestions on how to overcome them.

5.1 Discussion Group: Manufacturers

The manufacturers Group discussed the issues on IMT use in the various Uganda regions, capacity for their production and constraints for their use and made suggestions to overcome the constraints as shown in the matrixes below.

Use of IMTs in various regions of Uganda

Region	Use of IMTs
Western:	Main: <ul style="list-style-type: none"> - Head loading / back loading Others: <ul style="list-style-type: none"> - Bicycles - A few donkey carts - Pack – loading donkeys - About 10 ox-carts - Motor cycles - Boats
Eastern:	Main: <ul style="list-style-type: none"> - Back-loading - women - Head loading – men + women - Shoulders

<i>Iganga:</i>	<ul style="list-style-type: none"> - Dominantly bicycles - Also motor cycles - Donkeys introduced and abandoned
<i>Katakwi:</i>	<ul style="list-style-type: none"> - Loading donkeys - Sledges (wooden)
Northern	<ul style="list-style-type: none"> - Donkey panniers

IMTs Manufactured

	Ox-carts	Donkey-cart	Sedges	Wheelbarrows	Bicycle Trailers
Kamwenge	10	0	60	5	
Katakwi	2	10			
Jinja – FABIO					5
Tororo	15				
Pallisa	6	4			
SAARI	Animal training (15 per week)				
SAIMMCO, PECO	Manufacturers of farm and animal traction equipment including bicycle- and animal carts				
Village black smith, Patete	Blacksmith for tools & farm implements				

Constraints to use of IMT and suggested remedies

Constraints to IMT Use	Suggested Remedies
<ul style="list-style-type: none"> • Lack of tools for production & maintenance • Insufficient knowledge and skills. • Lack of flow of information from farmers to manufacture and vice versa • Few oxen trained • Negative attitude • Inadequate facilitations. • Lack of resource center for learning • Lack of effective network of IMTs. • Poor infrastructure especially (Roads) • Limited government commitment in IMT promotion. 	<ul style="list-style-type: none"> • Provide credit to manufacturers • Encourage collaboration among the manufacturer e.g. use of machines. • Provide training opportunities • Intensify training for all persons and oxen drawn carts • Sensitization and demonstration of usage. • Encourage farmers to have savings. • Advocacy for rural (community) roads. • Conducive policy to be included by government • Identify the people dealing with IMTs and encourage networking.

The plenary recommended that emphasis should be put on public private partnership whereby the mandate of the private sector and the role of government are clearly defined.

5.2 Discussion Group: Users

The Users Group discussed issues of IMT use according to distance/load moved and purpose such as domestic, agricultural and marketing activities and constraints faced by users. The matrixes below provide lists of IMTs used in Uganda according to distance moved and purpose as well as priority choice of IMT by users.

IMT Use in Uganda

IMT	Activity				Typical District
	Domestic	Farm to House	House/Farm to Market	Local Central to Urban Market	
	0-1 km	<3 km	Up to 5 km	>15 km	
Head loading	X (1) ^a	X (1)	X (1)		Soroti/Iganga
Back loading	X (1)	X (1)	X (1)		Mbale / Soronko/Kasese/ Bundibugyo
Bicycle	X (2)	X (2)	X (2)	X (1)	Iganga/Mbale/Soroti/ Katakwi
Stretchers	X (3)	X (3)	X (8)		Pader
Donkeys	X (5)	X (5)	X (4)	X (4)	Kapchorwa, Kasese
Oxen	X (4)	X (4)	X (3)		Katakwi Soroti/Kumi/ Katakwi
Wheelbarrow	X (6)	X (7)	X (7)		All
Carts	X (7)	X (6)	X (5)		Teso/Kumi/ Katakwi
Pick-up				X (2)	
Bodaboda (Motor Cycles)			X (6)		

^a x (1): Priority IMT number one for that activity

Constraints to use of IMTs and suggestions on how to overcome them

IMT	Constraints	Suggestions
Head loading / Back loading	Drudgery	Discourage use by encouraging use of more cost effective IMTs carts, donkeys, oxen
Bicycles	<ul style="list-style-type: none"> Short supply Expensive Maintenance cost Attitudes/Cultural issues Needs of persons with disabilities not addressed Limited to flat terrain 	<ul style="list-style-type: none"> Sensitizing people to maintain bicycles Improve payload capacity Adding bicycle carts credit Encourage where most appropriate Make cost effective by adding bicycle carts
Stretchers	Drudgery	<ul style="list-style-type: none"> Improve payload capacity
Donkeys / oxen	<ul style="list-style-type: none"> Low availability Expensive Lack of training Cultural issues Attitudes (sacred) refusing to use 	<ul style="list-style-type: none"> Training / sensitization Multiplication & credit support Change cultural attitude only bulls can be used Introduce where they are not

IMT	Constraints	Suggestions
Wheelbarrows	<ul style="list-style-type: none"> • Expensive • Maintenance • Short supply • Limited load • Drudgery – not suitable for women 	<ul style="list-style-type: none"> • Encouraging local production through training of local fabricators / artisans • Diversify models to suit different loading / gender needs • Credit support
Carts	<ul style="list-style-type: none"> • Limited production & supply • Lack of awareness • Expensive • Maintenance costs • Lack of training for local artisans • Attitude / gender • Narrow infrastructure 	<ul style="list-style-type: none"> • Training local artisan • Credit support • Sensitization with regard to gender • Encouraging local production through training of local fabricators / artisans • Train draught animals
Motorcycle Bodabodas	<ul style="list-style-type: none"> • Expensive • Maintenance costs • Poor Infrastructure • Limited loading capacity 	<ul style="list-style-type: none"> • Improve on and maintain infrastructure to increase access • Credit support
Pickups	<ul style="list-style-type: none"> • Too expensive • High maintenance costs • Poor infrastructure 	<ul style="list-style-type: none"> • Improve on and maintain infrastructure to increase access • Credit support • Collective ownership

In the plenary session it was noted that lobbying Government to reduce taxes on bicycles and access to credit could make more poor farmers afford acquisition of bicycles. A breeding program for donkeys would also make them available for introduction to other areas.

6. COLLABORATION ARRANGEMENTS & NETWORKING OPPORTUNITIES

As the research project will involve efforts of several research institutions, Government institutions and NGOs, each participating institution was given an opportunity to present itself to the participants and also to highlight its expected inputs and collaborative activities.

6.1 Transport Forum Group

6.1.1 Brief on the Transport Forum Group by Mr. Paul Kwamusi, Chairman, TFG

A group of Ugandans with the objective of fostering rural transport and development founded the Transport Forum Group in 1997. TFG is affiliated to the International Forum for Rural Transport and Development (IFRTD) in the United Kingdom. The IFRTD is a network of individuals and institutions interested in transport and development issues. The mission of the TFG is to contribute to development of a sustainable transport system in rural areas through networking, information sharing, advocacy and research. The TFG has been involved in gender and transport research projects. Presently, the TFG is involved in inland water transport, crop marketing research projects. Other projects in the pipeline include HIV/AIDS and poverty factors in transport.

6.1.2 Transport Forum Group inputs to the Project by Dr. C.K. Kaira, Local Project Coordinator

The TFG is managing the ART project locally. An Administrative Assistant, Mr. Mitala, who is the only full-time staff on the Project, mans the local project office. Dr. Kaira, the Local Project Coordinator, will only put in one day a week over the life of the project. The TFG will also provide a local Sociologist, Mr. Kwamusi, and a Gender and Field Researcher, Ms Iga, for the Project. Dr Kaira, Mr. Kwamusi and Ms. Iga will participate in the participatory rural appraisal and the questionnaire administration. Other Government institutions and NGOs located in the research districts will carry out monitoring of the IMTs. Coordination will be done by the TFG with support from the international team. The TFG will organise the workshops, training of the artisans, production of the IMTs and farmer exchange tours between Kenya and Uganda. The local Project Coordinator will visit the Ghana Agricultural Rural Transport (ART) project to learn good and bad lessons from the project, which is ending in September 2002. Lastly, the TFG will participate fully in report writing and dissemination.

6.2 Transport Research Laboratory Inputs By Mr. Mustapha Benmaamar, TRL

Mr. Benmaamar started by describing what TRL is, its functions and contributions to the project, and this included learning from Ugandan experiences, contribution to the rural participatory appraisal (market research) and analysis of the costs and benefits in development and promotion of IMTs. The full presentation is **Appendix 4**.

Mr. Benmaamar then outlined the factors contributing to transport costs and these comprised of type of commodity, load and distance traveled, nature of marketing system and efficiency of transport system. He gave a comprehensive comparison of both the African and Asian farmers' transport costs, distance to markets and storage, market access and transportation of own produce. He finally concluded with a scope of reducing transport costs and an outline of the benefits of IMTs.

Issues arising out of discussions

- In Uganda, farmers are not organized and therefore intermediaries take advantage.
- Transport inputs in Asia are cheaper compared to Africa.
- In Uganda, drivers do not maintain their vehicles to a satisfactory level, fuel is very expensive and not everyone has access to the market. The critical mass in Pakistan has a big advantage as compared to Uganda.
- It is better for IMTs to be managed by groups because they can easily amalgamate markets as compared to individuals.

6.3 Collaboration With KENDAT Project, By Dr. Pascal Kaumbutho

Dr. Kambutho expressed his gratitude in being able to present his paper and linking both projects. He pointed out that the ART / Rural Transport Services (RTS) project is being managed by a consortium led by KENDAT in association with Silsoe Research Institute, University of Warwick, Swedish University of Agricultural Sciences (SLU), IFRTD, ITDG and the Kenyan National Forum Group (NFG). The Swedish International Development Agency (SIDA), DFID/IUDD and Natural Resources International (NRIL) Ltd fund the projects.

The NRIL supported project is mainly interested in key data generation and transport interventions and research for the small agricultural sector operations including marketing. This is the area in which KENDAT will be collaborating with the Ugandan project. He enumerated other projects being implemented by KENDAT and also pointed out the project composition.

The Kenyan Project concerns include among others definition of structural conditions, capturing vulnerability context, assessment of livelihoods, assets and development of the emerging picture. The approach to the Kenyan project consists of literature review, PRA, key informant interviews to capture ingredients such as District generated data including policy, institutional structures and support, social structures, marketing systems (choices), transport and IMTs, financial and environmental impact, etc.

Emerging picture reveals that national development has not favoured micro-enterprises support to transport services: hence high social and human capital exploitation in a low finance and physical capital environment. However, the ART project can learn from Asian models which employ community-based support interventions with relatively low central control of transport services. There are also several ongoing government project which can provide the required information and support for the ART project. He emphasized the need for exchange visits by farmers, as well as users and entrepreneurs of IMTs. Consideration of ergonomics for IMTs, marketing of horticulture produce as well as, new and underutilized crops such as jackfruit are areas that can be looked into in this research. The need to collaboration with local DFID offices cannot be over emphasized.

Issues Arising out of Discussions

- Animal traction started in 1909 but has taken off slowly and therefore the need to implement good innovations quickly.
- There is need to provide households with means to transport surplus produce to the markets.
- Importance of involving leaders and elders in projects, and also involvement of all beneficiaries including among others women, children and donkey users cannot be overemphasised.
- Appreciation of available schemes carried out by Global 2000 aimed at affirmation of beneficiaries.

6.4 Ergonomics by Mr. Dave O'Neill, Silsoe Research Institute

Since Mr. Dave O'Neill of the Silsoe Research Institute could not attend the workshop, Dr. Kaumbutho of KENDAT presented the paper (**Appendix 5**) on his behalf.

Ergonomics is defined as the effective and efficient use of human and animal energy, together and separately. It was pointed out that effectiveness of use of the machine depends on the compatibility of the person with the machine. In fact, ergonomics is designing for people and includes performance, safety comfort and livelihoods. Regarding performance, emphasis is on productivity and output influenced by availability and appropriate application of energy, time, knowledge and other resources. Concerning safety, he elaborated on accidents, injuries and diseases as factors considered in the design of human-machine interface and effects on the environment. Comfort is achieved through appropriate size and shape as well as user-friendliness. These cover issues pertaining to anthropometrics, biomechanics and gender differences.

Regarding livelihoods, the main concerns are human and physical capital (and their interactions). However, social capital is relevant for management issues while natural and financial capitals are for resource issues. In this respect, the presenter decried the culture of people not maintaining their property, which is prevalent in Africa.

For the Agricultural Rural Transport Project, the application of ergonomics concepts will concentrate on portage, draught animal power (DAP), IMTs, marketing and packaging within the context of the prevailing farming systems. It is important to note that human, animal and engine power sources complement one another and are not in competition.

Issues Arising out of Discussions

- There was mention of a practical way of using radios to improve on the way donkeys are being treated as opposed to beating them.
- There is need to include prisoners in development of modernization of agriculture (animal traction applications) instead of relying on hand hoes.
- On bodaboda operators, participants wanted to know what was being done on the diminishing returns of cyclists after riding bicycles for at least three years.
- Concrete research should be carried out so as to design appropriate IMTs. An example was given of the Bahima cattle keepers who sing for their cows, although research has not been carried out to find why they do so. Local institutions were called upon to carry out research in these areas.
- On cruelty meted to the animals, it was suggested that mechanisms should be devised to protect them.
- Social issues within the community should be taken into consideration when implementing projects.

6.5 Reflections On SAARI Collaboration, By Mr. Peter Obuo

Mr. Obuo informed the participants that SAARI conducts research on cotton, millet and a few other crops and animal production. SAARI also has an animal traction section dealing mainly in harnessing.

On animal traction, he pointed out that designing used to be carried out, although currently this is done by AEATRI while SAARI only inspects what has been designed. SAARI is mainly involved in dissemination which involves community participation and drawing of plans. NGOs, community based organisations (CBOs) and other beneficiaries such as students do training in animal harnessing. He affirmed SAARI's willingness to participate in the project although they have been mainly dealing with

transportation from the field to the farmers' household. He concluded by expressing his happiness on the project's objective of wanting to improve farmers' means of transporting produce to the markets.

Issues Arising out of Discussions

- There was disappointment on the way animal traction had been promoted to the beneficiaries, and an example of Busoga region was given where there is favourable conditions for animal traction but nothing has been done.
- A plan on animal traction has been developed although implementation has not been effected yet.
- On the rate of oxen use and limitations, it was pointed out that this has variations, for example in Katakwi, the adoption rate is 60% while in western Uganda the adoption is low. This was mainly attributed to the culture of loving animals and the mountainous terrain of the community. Examples from Teso, and Lango farming systems where farmers favour some transport means were highlighted.
- Carrying out a successful survey depends on involvement of stakeholders at the grassroots and this is the major way of ensuring adoption of research recommendations. This also ensures that the beneficiaries come up with priorities based on the research findings.
- Adoption of technology is usually low in the beginning although the trend changes with time as was evidenced with animal-carts in Tororo.
- Examples of NGOs and CBOs interested in acquiring better means of transport were identified, and these included FOKAPAWA, which is using ropes to transport firewood.

6.6 International Forum for Rural Transport and Development By Peter Njenga

Mr. Njenga started by giving a background of IFTRD, and mentioned that it has a membership of 2000 members supported by the Secretariat in London UK with 4 regional offices located in South Asia, Latin America, West Africa, and Eastern and Southern Africa. He outlined the reason for decentralization as stemming from the growth of projects especially in the South and gave an example such as inland water transport, HIV/AIDS and poverty and transport including the current project.

Mr. Njenga informed participants that there are a number of websites that are useful and encouraged them to log in whenever possible. The websites are:

www.iftrd.org; www.nida.ug; www.livelihoodtechnology.org (see the transport page); www.transport-links.org; www.transport-links/rcs/html/

7.0 THE WAY FORWARD

7.1 Visit by Dr. Kaira to Action Research Project on Intermediate Means of Transport In Ghana in July 2002

Between 10th and 17th July 2002, Dr. Kaira & Dr. Mutua of KENDAT visited the sister ART project in Ghana carried out by the Department of Anthropology, University of Durham, UK in collaboration with the Village Infrastructure Project, Rural Infrastructure Coordinating Unit, MOFA Agricultural Engineering Services Department, Ghana Ministry of Food and Agriculture (MOFA). This project, based in five villages in Central Region, is concerned with assessing the potential for Intermediate Means of Transport (IMTs) to improve farm to market access in coastal Ghana. It aims at assessing IMT potential through action research.

The trip to Ghana was rewarding in terms of experience regarding project methodology. The village workshops are equivalent to the PRAs to be conducted in September/October 2002. With regard to supply and monitoring IMTs of the beneficiaries, the Uganda ART project should not put conditions that limit the beneficiary from using the IMTs as he/she sees fit. The credit scheme to be introduced to the beneficiaries should be paged on income generating activities that need the support of IMTs to be successful.

7.2 Participatory Rural Appraisal September – November 2002)

The PRAs will take place in the three districts that were selected namely Kasese, Katakwi and Pader. Preparations for the PRAs are ongoing and the fieldwork will start on 22nd September and end on 26th October 2002, staying two weeks in each district.

7.3 Questionnaire Survey (October – November 2002)

Design of the questionnaire on transport services is ongoing and by 8th September 2002 the questionnaire should be ready for testing. The questionnaire format will be based on the computer software that will be used for analysis. Administration of the questionnaire will follow the PRAs immediately after the PRAs in each village.

7.4 Analysis of Survey Results (December 2002 – January 2003)

Analysis of the data from the questionnaire will be analysed using the selected computer software for analysis. The data from the questionnaire will be entered in the computer as soon as returns from the covered villages reach the TFG Office starting from the second week of October 2002. Analysis of the baseline survey will start in December 2002 and continue into January 2003.

7.5 Training of Ugandan Blacksmiths in Kenya (November – December 2002)

As the Team conducts the PRAs, training needs for the blacksmiths identified in the three districts will be assessed and a selected few from each district will be sent to the Triple W. Engineering Ltd facility in Kenya and SAIMMCO Ltd in Soroti for training in production of carts and their spares, and maintenance. Placing of artisans for training will start in November 2002.

7.6 Purchase of Selected IMTs to Start Action Research Activities in Two Districts (November – December 2002)

After the PRAs, the Team will decide on which IMTs to supply or introduce in each surveyed villages. The modalities for acquisition of the IMTs by the beneficiaries will be decided on in collaboration with micro-finance NGOs based in the districts. Once the beneficiaries have acquired the IMTs, testing and monitoring the use of the IMTs will start by January 2003.

7.7 Synthesis of Information and Data Involving Visit to UK (February – March 2003)

During February 2003, Dr. Kaira will visit TRL in UK for one week to join the Team Leader and other UK based researchers in synthesising the survey information and to complete production of the baseline study report.

Appendix 1

Kick-Start Workshop On Improved Food Crops Marketing Through Appropriate Transport For Poor Farmers In Uganda Programme

Monday, May 27th, 2002	
08:00 - 9:00	Arrival and Registration
TECHNICAL SESSION I: Chairman, Mr. Paul Kwamusi, Transport Forum Group (TFG)	
09:00 – 9:20	Introductions, Workshop Objectives and Outputs - Dr. Kaira, Local Project Coordinator TFG
09:20 – 10:00	Overview of the Rural Transport Project - Mr. Kleih, Team Leader NRI
10:00-10:30	Discussions
10:30 – 11:00	COFFEE/TEA BREAK
11:00-11:45	Reflections on TRL inputs – Mr. Benmaamar, Transport Economist, TRL
11:45 – 12.15	Reflections on TFG inputs – Dr C Kaira, Local Project Coordinator TFG
12.15-12.30	Reflections on areas of collaboration with KENDAT - Dr. Kaumbutho, KENDAT
12:30 – 12:45	Project & Reflections on Ergonomics inputs to NRIL work - Dr. Kaumbutho, KENDAT
12:30-13.00	Reflections on SAARI Collaboration
13:00 – 14:00	LUNCH BREAK
TECHNICAL SESSION II: Chairman, Mr. Njenga, IFRTD Coordinator, East and Southern Africa	
14.00 – 14.15	Brief On International Forum On Rural Transport And Development (IFRTD) - Peter Njenga
14.15 -14.30	Research districts selection – Dr. Kaira, Local Project Coordinator, TFG
14.30-17:30	Brainstorming on research site selection
Tuesday, May 28th, 2002	
8:30 – 9:00	Introduction to Group Work
9:00 – 10:00	Group Discussions: (Manufacturers Group & Users Group II)
10.00 – 10:30	TEA/COFFEE BREAK
TECHNICAL SESSION III: Chairman, Mr. Peter Njenga, IFRTD Coordinator, East and Southern Africa	
10:30-11.30	Presentation of Group Discussion Recommendations – Group Reporters
11.30-12.00	Summary of Day 1 and issues arising – Dr. Kaira, Local Project Coordinator, TFG
	Presentation of Plan for Modernization of Agriculture (PMA) Secretariat - Dr. Odwongo, Director PMA
13.00 –14.00	LUNCH
TECHNICAL SESSION III: Chairman, Dr. Odwongo, Director, Plan for Modernization of Agriculture (PMA) Secretariat	
14.00 – 14:15	Presentation of Research Methodology– Mr. Kleih, Team Leader, NRI
14:15 – 16.00	Brainstorming on Research Methodology
16:15 - 16:30	COFFEE/TEA BREAK
CLOSING SESSION: Chairman, Dr. JJ Otim, Presidential Advisor on Agriculture & Animal Industry	
16:30 - 16:45	Concluding remarks – Dr. Kaira, Local Project Coordinator
16.45-16.50	Vote of Thanks – Mr. Paul Kwamusi, Chairperson, TFG
14:45 –	Discussion
16:50-17.00	Closing Remarks – Ms. Agnes Nayiga representing Dr.. Kisauzi, Regional Coordinator, NR International
18:00	COCKTAIL

Appendix 2

Kick-start Workshop On Improved Food Crops Marketing Through Appropriate Transport For Poor Farmers In Uganda Held On 27th – 28th May, 2002 At Sunset Hotel International

	Name	Designation	Institution	Telephone/Fax/ E-mail
1.	Peter Njenga	Coordinator Eastern & Southern Africa	International Forum for Rural Transport and Development (IFRTD)	254-2-883323 254-2-722360
2.	Kayemba Patrick	Program Manager,	First Africa Bicycle Information Office (FABIO) Plot 9 Main Street PO Box 1537, Jinja, Uganda	077-469156
3.	Basil W. Wanzira	Program Director	Poverty Alleviation and Community Development Foundation (PACODEF) Plot 3 Buyobo Close PO Box 2594 Mbale, Uganda	077-487938 256-45-35334
4.	Loumo Ayolo Teddy	Project Engineer	Karamoja Project Implementation Unit (KPIU) Post Office building Kitante Road PO Box 5244 Kampala, Uganda	045 – 35077 077-540306 Tel/Fax: 041-258439 omuolte@yahoo.com
5.	Dr. W. O. Odwongo	Director	Plan For Modernization of Agriculture (PMA) Secretariat Plot 2-4Lugard Avenue Road PO Box 102 Entebbe, Uganda	041 – 235459
6.	Dr. John J. Otim	Advisor to H.E the President of Uganda & Interim President Agricultural Council of Uganda	Office of the President 1 st Floor, Baumann House Parliament Avenue PO Box 7038, Kampala, Uganda	Tel: 041-236473/4 or 041-347291/3 Fax: 041-345560 077 – 430978 jjotim@hotmail.com
7.	Harriet Iga	Treasurer/ Researcher/ Gender Specialist	Transport Forum Group 5 Edinburgh Avenue Kyambogo Lower Estate PO Box 20 Kyambogo, Uganda	Tel/Fax: 256-41-286218 077 – 436515 045 - 73070 intransport@yahoo.com
8.	Olido Simon	Artisan	Design Centre	256—045-73070

	Name	Designation	Institution	Telephone/Fax/ E-mail
	(Chadborn Alan)	(Leader)	Youth with A Mission Katakwi Design Centre (YWAM) PO Box 50, Katakwi, Uganda	work@ywam.or.ug
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9.	Nayiga L. Agnes	Assistant Regional Coordinator (Regional Natural Resources Coordinator)	DFID East African (DFIDEA) Natural Resources Research & Development Coordination Office (NRRD) Plot 29A Kanjokya Street, Kamwokya PO Box 22130, Kampala, Uganda @ Nkoola Institutional Development Associates Ltd.	077-518554 256-41-530696 Fax: 256-41-342082 dfidnr@nida.or.ug or agnesnayiga@nida.or.ug
10.	Obuo J. E. P.	Coordinator Draught Animal Power – animal Traction	Serere Agricultural and Animal Production Research Institute SAARI, Draught Animal Power (DAP) PO Soroti, Uganda	077-691307 077-702553 Fax: 077 250553 saaridir@infocom.co.ug corusu@infocom.co.ug
11.	Wekesa David	Director/Trainer/Specialist	Technology for Rural Animal Power (TRAP) PO Box 1441, Kamwenge, Uganda	077256077603669 forud@yahoo.com
12.	Joseph Mugagga	Tutor	KULIKA Charitable Trust Uganda	077-609515 041-266260 041-266260 yarfew@yahoo.com
13.	Mulumba Jude M.	Chairman	Youth Action For The Renewal of Firewood Energies and National Wells (YARFEW) in Uganda	077-681055 077-310842 071-845904
14.	Sr. Veronica Oyela	Chairperson	Forum For Kalongo Parish Women Association (FOKAPAWA) PO Box 7038, Kampala, Uganda	077-495024 077-430978 256-41-221566 256-41-347291/3
15.	Etongu Geoffrey	Project Coordinator	Draught Animal Power Community Welfare Initiative (DAPCWI) Project P.O. Box 187, Katakwi, Uganda	256-045-61292 etongugeoffrey@yahoo.com

	Name	Designation	Institution	Telephone/Fax/ E-mail
16.	Abubakar M. Moki	Director Planning & Technical Services	Uganda National Farmers Federation (UNFFE) PO Box 6213, Kampala, Uganda	Tel: 256-41-340249 unifa@starcom.ug
17.	Obote Richard	Chairperson	Kangai Integrated Community Development Initiative (KICDI) PO Box 749, Lira or PO Box 1173, Kampala, Uganda	
18.	Kleih, Ulrich	Team Leader	Natural Resources Institute, Enterprise, Trade, and Finance Group, University of Greenwich, Central Avenue, Chatham Maritime, Kent ME4 4TB, UK	44-1634-883065 Fax: 44-1634-883706 U.K.Kleih@greenwich.ac.uk
19.	Benmaamar, Mustapha	Transport Economist	Transport Research Laboratory Ltd (TRL), Old Workingham Road, Crowthorne, Berkshire, RG45 6AU, UK	01344 -770066 Fax: 01344 – 770356 mbenmaamar@trl.co.uk
20.	Kwamusi, Paul	Chairperson/ Sociologist ART	Transport Forum Group (TFG), 5 Edinburgh Avenue, Kyambogo Lower Estate, PO Box 20 Kyambogo, Uganda	Tel/Fax: 256-41- 286218 077-405503 paulkwamusi@yahoo.com
21.	Dr. Kaira, Charles K.	ART Project Coordinator	Transport Forum Group (TFG), 5 Edinburgh Avenue, Kyambogo Lower Estate, PO Box 20 Kyambogo, Uganda	Tel/Fax: 256-41- 286218 cckkaira@africaonline.co.ug
22.	Mitala, Timothy	Admin. Assistant	Transport Forum Group (TFG), 5 Edinburgh Avenue, Kyambogo Lower Estate, PO Box 20 Kyambogo, Uganda	Tel/Fax: 256-41- 286218 cckkaira@africaonline.co.ug

**KICK-START WORKSHOP AT SUNSET HOTEL
JINJA 27-28 MAY 2002**

**Improved Food Crops Marketing through
Appropriate Transport for Poor Farmers in Uganda**

**Research Project funded by the Crop Post-Harvest Research Programme
of the UK Department for International Development (DFID)**

**Natural Resources Institute
University of Greenwich, UK
(NRI)**

**Transport Forum
Group of Uganda
(TFG)**

**Transport Research
Laboratory, UK
(TRL)**

IMPROVED FOOD CROPS MARKETING THROUGH APPROPRIATE TRANSPORT FOR POOR FARMERS IN UGANDA¹

Project Summary

The lack of appropriate means of transportation in rural areas is a recognised fact in many countries of Sub-Saharan Africa. In particular, women bear the bulk of the burden (i.e. head loading) when it comes to activities such as transport of food crops to and from markets, and collection of water or fuelwood.

The project's main objective is to identify which means of transportation are appropriate in different parts of rural Uganda, and to promote the resulting recommendations. The main activities consist of baseline studies, action-research activities to test and validate Intermediate Means of Transportation (IMTs), and dissemination of results. Issues to be addressed include: transport needs in the agricultural marketing system, transport economics, aspects of mechanical engineering and ergonomics, community access roads, up-take of means of transportation and constraints to it.

Project Team

- Natural Resources Institute (NRI), University of Greenwich, UK
- Transport Forum Group of Uganda (TFG), Kampala
- Transport Research Laboratory, Crowthorne, UK

In addition, it is intended to involve staff from Ugandan Government organisations such as PMA Secretariat, the Agricultural Engineering and Appropriate Technology Research Institute (AEATRI), and the Serere Agricultural and Animal Production Research Institute (SAARI) during the course of the research. Collaboration with the private sector, and NGOs such as Sasakawa Global 2000, Forum for Kalongo Parish Women Association (FOKAPAWA), World Vision, and Actionaid will be sought.

Also, collaboration with similar projects in Kenya and Ghana will take place.

Project Starting and Finishing Dates

- Phase I: 1 April 2002 – 31 March 2003
- Phase II: 1 April 2003 - 31 December 2004
- Phase III: 1 January 2005 – 31 March 2005

As yet, funding has been assured for Phase I. Subject to a review in March 2003, the project will be extended into Phases II and III.

¹ This is a research project funded by the Crop Post-Harvest Research Programme of the UK Department for International Development (DFID). The views expressed here are not necessarily those of DFID.

Geographic Focus

It is intended that the main project activities will take place in three Districts in Uganda, which are to be identified as part of this workshop. However, this will not preclude links with other Districts where there is a demand for Intermediate Means of Transportation (IMTs) by poor farmers.

Project Outputs

The main outputs of the project will be:

- Baseline study (Phase I);
- Validated means of transportation, which are appropriate for poor farming communities in Uganda and other parts of Eastern Africa (Phase II);
- Promotional material (Phase III).

Target Audiences for Project Outputs

- Decision makers in relevant GoU Ministries (e.g. MAAIF) and Local Government institutions.
- National Agricultural Research Organisation (NARO), and its research institutes dealing with agricultural mechanisation.
- UNATCA, NGOs, such as Sasakawa Global 2000, Forum for Kalongo Parish Women Association (FOKAPAWA), World Vision, Actionaid, etc.
- Networks such as the International Forum for Rural Transport and Development (IFRTD) and ATNESA (Animal Traction Network for Eastern and Southern Africa).
- Private sector companies dealing directly and indirectly with rural transport, such as manufacturers of means of transportation (e.g. SAIMMCO Ltd).
- Those members of the donor community in Uganda and other parts of the region, who have an interest in rural transport (e.g. DFID, World Bank, European Union).

Background Information

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

Means of transportation were identified as a major constraint to agricultural marketing during the course of a CPHP funded research project entitled “Community access to marketing opportunities”, which was carried out in Uganda between October 1998 and March 1999 by NRI in collaboration with the Agricultural Policy Secretariat (Kleih *et. al.* 1999).

“Rural people in Africa devote a significant amount of time and effort to transport, much of which involves walking in and around the village and is geared to domestic and subsistence needs” (Barwell, Summary of Discussion Paper no. 344, 1996; World Bank web-site January 1999). Women are often the ones who are responsible for the bulk of the transport burden in

rural areas, and in many cases this is aggravated by male migration to urban centres. (Ellis, 1997).

The situation in Uganda is not different to this general picture of Sub-Saharan Africa. Head-loading, in particular by women, is a common feature of rural transport in remote areas of the country. This includes transport of produce from the field to the farm, and from there to markets. According to a study by Barwell (1996, cited in Akidi et al 1997) in Mbale District, domestic transport – mainly for water and firewood collection - constitutes 73% of household transport demand. Travel and transport for farming activities and marketing made up only 18% and 6%, respectively. The latter figures are likely to reflect a high degree of subsistence production in the farming system studied. It can be assumed that agriculture related travel and transport would occupy a larger share in a more commercial farming system. At the same time, there remains the question to what extent improved rural transport leads to a higher degree of commercialisation of agricultural production and marketing.

According to Akidi et al (1997), at the national level, about 70% of the agricultural produce sold at local markets are transported by head-loading (i.e. mostly by women and children). Bicycles, which are mainly used by men, account for 20%, motorised transport for 8% (i.e. mainly pick-up trucks), and donkeys for 2%. The use of ox-carts or donkey-carts is very limited, due to lack of technical know-how on their fabrication, high initial cost and lack of traction animals. 93% of transport of produce between the farm and homestead takes place by head-load.

Although the need for motorised transport over long distances is recognised, it appears important to improve the use of Intermediate Means of Transportation² at village level. It is important to recognise the contribution that IMT's can make to an efficient rural transport system, particularly for the shorter and lower demand routes. These vehicles are essential for rural communities to reach economic and social facilities. They are also an essential element in the transport system because they perform the collection role that enables goods to be amalgamated and larger vehicles to operate effectively.

One way of increasing the availability of transport and increasing competition in the market place would be to encourage and establish the use of new vehicle types. Bicycle, rickshaw and motorcycle stations are common in both urban and rural areas of many Asian countries for shorter distance movements. Agricultural tractors, power tillers, locally manufactured farm vehicles, motorcycles with side cars and a range of human or animal powered vehicles such as back packs, hand carts, bicycle technology and a range of animal powered vehicles could all be used to carry heavier loads, further, and on routes with a low density of demand. The exact vehicle to be chosen would be dependent on a whole range of factors including demand, infrastructure constraints, cost, cultural factors and the nature of farming systems.

Due to their low cost, Intermediate Means of Transportation are the most affordable means of transportation for poor farmers. However, the fact that head-loading still dominates rural transport suggests that a better understanding of the constraints to a more wide-spread up-take of IMTs are required. In this context, issues such as gender roles, economics of means of

² E.g. Wheelbarrow, bicycle, pack animals, and animal drawn carts. In some cases small, motorised vehicles such as motorcycles, single-axle tractors and so-called Asian utility vehicles are also included.

transportation, existence of relevant manufacturing and repair facilities, road infrastructure, institutional constraints, cultural attitudes, availability of credit, and the link between research and extension all play a role.

Success in the introduction and promotion of new IMT's will be largely dependent on creating a favourable enabling environment. There are a range of measures that might assist with providing cheaper and more frequent rural transport services. In practice each location will require a different combination of measures. For each study area surveys will need to be carried out and the results analysed to identify where the key constraints reside. Local discussions will also be required in order to provide some feedback as to which measures can be successfully implemented and which might cause the most problems.

Training for operators, drivers and mechanics may be very worthwhile to help reduce maintenance costs and the risk of accidents. Credit is likely to be required if new types of vehicle services are to be introduced. New IMT services may require new credit facilities.

The success of this type of initiative will be dependent on a strong entrepreneurial culture which will actively seek new opportunities to maximise the use of assets. To foster this culture training may be required to teach basic accounting skills and to highlight the types of opportunity that might be available. This training should not be confined to vehicle operators but also to people providing vehicle repair facilities, importers of vehicles and spares and the rural industries, which the vehicle service providers serve.

However, policy makers sometimes view IMT's in an unfavourable light and so legislation often acts against the successful use of these types of vehicles. The project will recognise the contribution made by this part of the transport sector and assess the extent to which government legislation or commercial practise inhibits the use of IMT's.

The project will also examine the role of demand management in the provision of IMT's. The types of intervention that will be examined are the optimum positioning of markets to maximise demand for services and the use of modern communications to aid in the matching of demand and supply.

It is important to shed more light on on-going activities such as the research carried out by NARO Institutes (e.g. AEATRI, SAARI), or NGO projects. The NGO ACT in Nalweyo County of Kibaale District has two components related to oxen traction (i.e. ploughing and ox-carts). Although their work represents an important contribution to agricultural mechanisation, it appears that their efforts are largely unknown in Kampala. Given that there are lessons to be learnt, a better integration of their activities into the extension and research services seems important.

Rural roads engineering is important in assessing the types of interventions that would be most appropriate for ensuring access of IMT's on market access roads, community roads and village level infrastructure such as paths and tracks. Engineering, in the context of this project, concentrates on measures that ensure year round passability and traffickability and not those that are purely improving road roughness.

The main purpose of many rural road interventions is not to reduce road roughness but to improve the passability and traffickability of roads, particularly in the wet season. Passability refers to the absolute ability of any vehicle to pass a difficult spot. Traffickability refers to the ease with which vehicles of different types can pass. In much of rural Africa absolute impassability is relatively rare while traffickability problems are more common. Research carried out in Tanzania found that during the wet season, traffic volumes fell as drivers refused to risk getting bogged down, while walking actually rose in volume during the wet season. Overall, the indications were that there was substantial suppressed demand for transport services during the wet season.

Spot problems are often found to represent only a small proportion of the total network (typically 10%) and that problem areas extend for upto 200 metres. By addressing infrastructure shape, drainage, and basic structures there can be significant improvements in road traffickability without the need for the costly total rehabilitation of the whole network.

Table 1: Performance of intermediate means of transportation

Mode	Max load (kg)	Max speed (km)	Max range (km)	Topography 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.

Table 2: Pros and cons of selected non-motorised means of transportation

Bicycles

Pros	Cons
<p>Don't require fuel</p> <p>Relatively fast</p> <p>Cheap</p> <p>Can be used on narrow paths</p> <p>Local manufacturing and repair capacity exists in many countries</p> <p>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.</p>	<p>Often not used by women, owing to cultural attitudes, or lack of appropriate equipment (i.e. bikes without cross-bars)</p> <p>Pay load is limited to about 100 kg.</p> <p>Difficult to use in hilly terrain, in particular if paths/tracks are not sufficiently smooth</p>

Ox-carts

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

Donkeys

Pros	Cons
Due to the animals' size, they can be used by women and even children	Donkeys survive best in arid or semi-arid regions. Disease prevalence and mortality rate increase if annual rainfall is above 700 – 1000 mm.
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	If used as pack animals, carrying capacity is limited to about 70 – 100kg.
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 rustling	

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

Project Activities

The following summarises the main activities to be carried out:

Phase 1 (12 months)

- a) Assisting Transport Forum Group in installing a project office
- b) Workshop to kick off project
- c) Baseline study

Phase 2 (21 months)

- d) Workshop to present findings of baseline study and plan activities for phase 2 of the project.
- e) Participatory action-research activities to test and validate selected means of transportation. This also involves two PRAs and one statistical survey.

Phase 3 (3 months)

- f) Workshop to present research results
- g) Dissemination and publication activities

Phase 1

- a) Assisting the Transport Forum Group (TFG) to install an office. This would involve the purchase of computer equipment (i.e. computer, printer, e-mail connection), telephone connection, stationary and contribution to rent. In addition, the project would fund an Administrative Assistant over the three-year life of the project.

- b) The **kick-off workshop** will be organised in Jinja immediately following the international workshop on Animal Traction and Conservation Agriculture. The main purpose of the workshop is to involve key stakeholders and all members of the core research team in planning the project activities in detail. Members of the KENDAT led project in Kenya and the International Forum for Rural Transport and Development will join the workshop.
- c) The **baseline study** will start immediately after the workshop. It is envisaged to use a combination of participatory and quantitative survey techniques in three Districts representing different farming conditions of Uganda. The survey will be led by the TFG based project co-ordinator.

Fieldwork will start with a **Participatory Rural Appraisal (PRA)** to be undertaken by a multi-disciplinary four-person team in three Districts. In the initial phases of the PRA, training of collaborators and testing of techniques is likely to be required.

The PRA will be followed by a **questionnaire survey** in the same Districts where the PRA took place. Given that the latter will have covered the majority of qualitative questions, it is envisaged that the statistical survey will be highly focused. The hypotheses to be tested will be based on the findings of the PRA. It is envisaged that 360 households will be interviewed (i.e. 15 households in 8 villages in 3 Districts each). In each District villages will be stratified according to criteria such as remoteness and farming potential. Random sampling of households will take place in the villages themselves.

The **objective of the baseline study** is to assess the farming system and the need for rural transport, including the role of intermediate means of transportation, constraints to up-take, and potential implications for agricultural production and marketing. The baseline study will be designed so that it allows a comparison of the situation before and after the introduction of selected means of transportation.

In order to assess the most appropriate transport interventions to assist with food crop marketing in the project area it is important to understand the main characteristics of both the rural transport system and the pattern of agricultural marketing.

Information needs to be collected on:

information on the types of transport used, their respective frequencies, their hire charges and their main cost characteristics. Estimates should be made of the total load moved per household and per village for the main harvest seasons and the scope for consolidating loads at particular times and locations.

Information needs to be collected on how transport relates to the marketing system. E.g.

- Overview of the marketing system, including crops sold, and points of sale (e.g. on farm, at house, village market, urban market)?
- Type of transport from both field to house, house to market and field to market
- Types of load, load sizes, load perishability, trip distances, trip frequencies,
- Who pays for storage and transport?
- The nature of the organisation of transport services need to be assessed. Are local transport cartels operating and how are transport fares and tariffs set? Are farmers (with small loads) at a particular disadvantage?

The types of transport most suited to the local situation need to be assessed. Will the paths, tracks, and roads be suitable for the different forms of transport? Can small scale measures be taken to improve and increase the types of transport? Is animal transport suitable, and do people have experience of work animals? Is tsetse fly a problem? Is animal feed and fodder freely available or will it need to be purchased at certain times in the year? What mechanical experience and skills are locally available?

The likely costs and suitability of different transport solutions might be indicated using the "Silsoe Rural Transport Planner". The RTP gives an indication of vehicle operating costs for a wide range of IMT's and also looks at constraints to effective up-take of vehicles such as the availability of credit facilities. The identification of these key technical, economic, social/cultural and infrastructure constraints will also be dealt with.

It is envisaged that IMTs that are already well-known in the region such as ox-carts or donkey-carts will be introduced on a small scale into selected farming communities. This is in order to gain time for testing and validating means of transportation. On the other hand, it is acknowledged that other IMTs, which do not exist in Uganda as yet, such as certain types of Asian utility vehicles need to be tested prior to dissemination.

Phase 2

- d) The first activity of Phase 2 will consist of a **workshop**, where findings of the baseline survey will be presented and a framework will be developed for this phase of the project.
- e) Phase 2 will be led by an **action-research approach** to test and validate the most appropriate means of transportation in the three Districts. This will draw as much as possible on on-going activities at the Agricultural Engineering and Appropriate Technology Research Institute (AEATRI) and Serere Agricultural and Animal Production Research Institute (SAARI), which are both members of the National Agricultural Research Organisation.

Selected means of transportation and animals will be introduced into villages visited during the course of the baseline survey. Given their role in rural transport, women in resource poor farming households will be particularly targeted. Concepts of Farmer Participatory Research will be used in design, implementation, monitoring, and evaluation of specific activities. This should also allow to make adjustments as the project progresses.

Certain types of IMT may have to be manufactured locally by the project, preferably using and improving technologies already in use in other parts of Africa and Asia. Other vehicle types will be imported at modest costs for trial purposes, and limited training may have to be provided for operators, farmers and mechanics.

The types of vehicles that may be assessed include different animal types and carts (e.g. donkeys, oxen), motorcycle technology (e.g. motorcycle sidecars, motorcycle trailers, motor-tricycles etc.), and agricultural vehicles (tractors, power tillers, E-tans/farm vehicles).

Research should focus on the multi-function aspects to these vehicle types. For example, animals and agricultural vehicles can be used for agricultural preparation, marketing, passenger transport and road works. This is important because keeping utilisation levels high for IMTs is an essential pre-requisite to their success. Success in projects seeking to introduce new vehicle technologies has been very mixed. This is very often because the vehicle, and associated training, have been focused on one activity e.g. agriculture. While the focus of this project will be on agricultural marketing, the use of vehicles for other purposes will not be ignored. In phase 2 of the project relationships with non-agricultural departments and organisations will be explored to maximise synergies.

Social and economic elements to be covered in this phase will concentrate on aspects such as:

- Use of additional time available as a result of improved transport technologies. For example, will women farmers spend more time with their families or on agricultural production and marketing?
- How to overcome cultural attitudes preventing up-take of certain technologies. This may include the design of a sensitisation campaign to raise the profile of IMTs.
- Economics of means of transportation. Here it ought to be remembered that even IMTs considered inexpensive usually represent an important investment for resource-poor farmers. As a consequence sufficient thought needs to be given to farmers' access to credit in rural Uganda. Different credit options will be assessed in more detail and recommendations presented.
- The role of local stakeholders in light of decentralisation.
- Other problems related to technological up-take and the link between research and extension.

Technical elements will include aspects such as:

- Mechanics of vehicles
- Ergonomics of the vehicles and their suitability for both women and men;
- Availability of spare parts and capability of supply industry (i.e. informal or formal)
- Road network and surface requirements, with particular emphasis on community access roads.

Two PRAs will be undertaken by the core research team during this phase in order to cover these aspects. The first one will be shorter in duration and have more the characteristics of a follow-up visit. (i.e. One week in three Districts each).

The second PRA will take place towards the end of Phase 2 and will be more detailed (i.e. 2 weeks spent in three Districts each) covering in detail the above points. This PRA will be followed by a **statistical survey** with households which have already been covered by the first survey and which have been exposed to newly introduced IMTs.

Some of the technical aspects of vehicles will require follow-up by engineers and other technical staff of SAARI and AEATRI. Mr David O’Neill of Silsoe Research Institute and Mr Colin Oram of Warwick University will provide inputs on these aspects into both the NRI and the KENDAT project.

Phase 3 (3 months)

- f) Stakeholder workshop jointly organised with KENDAT-led project to present research findings to private sector, Ministries, NGOs and donor community in East Africa.
- g) Dissemination and publication activities, including
 - Production of promotional material for validated IMTs. This will be in the form of technical briefs, issue papers, and policy briefs.
 - Networking with organisations in Uganda and other parts of the world, although this will take place throughout the project.
 - Promotion of validated means of transportation through international networks such as ATNESA (Animal Traction Network in Eastern and Southern Africa) and the IFRTD (International Forum for Rural Transport and Development).

Logframe: Agricultural Marketing and Appropriate Rural Transport in Uganda

Narrative Summary	Indicators of Achievement	Means of Verification	Risks and Assumptions
Goal			
Poor people benefit from new knowledge applied to food commodity systems	<ul style="list-style-type: none"> - By 2005, increased number of poor households, in two countries, who use improved storage and agro-processing techniques in an environmentally sustainable manner. - By 2005, increased numbers of poor households, in two target countries, benefit from improved marketing and credit systems. - By 2005, increased contribution to nutrition of poor households from own produced food. - By 2005, increase in income from the sale of fresh and processed crops by poor households, in two countries. 	National and local adoption rate surveys National food security data	Poor people invest benefits to improve choices and options for livelihood strategies.

Purpose			
<p>Strategies developed and promoted, which improve food security of poor households through increased availability and improved quality of food and better access to markets.</p>	<ul style="list-style-type: none"> - By 2005, cost-effective marketing and credit systems validated to enable small-scale producers to add value to harvested crops. - By 2005, new knowledge adopted by target institutions. - By 2005, end users in target countries are aware of knowledge programme outputs 	<p>Annual Research programme reports.</p> <p>External refereeing</p> <p>External O/P reviews</p> <p>Target institutions' reports</p>	<p>Resource managers, producers and processors are able to adopt new knowledge</p> <p>Enabling environment exists for widespread adoption of new knowledge.</p> <p>Capabilities of target institutions maintained at least at current levels.</p> <p>Food production constant or increasing</p>
Outputs			
<p>1. Baseline survey</p> <p>2. Action-research activities in three Districts</p> <p>3. Promotion of validated means of transportation</p>	<p>Baseline study completed 12 months after start of project</p> <p>Intermediate Means of Transportation introduced into communities in three Districts 18 months after start of project</p> <p>Production of technical brief, issues paper, and policy briefing paper produced by the end of the project</p>	<p>Workshop and survey reports submitted to CPHP Manager</p> <p>Reports submitted to the CPHP Manager</p> <p>Briefs and issues papers available on network websites</p> <p>Article published in peer reviewed journal</p>	<p>Target institutions invest in the uptake and application of research results.</p> <p>As above</p> <p>As above</p>
Activities	Inputs	Means of Verification	Important Assumptions
<p>1.1 Assistance to the Transport Forum Group of the International Forum for Rural Transport and Development to set up a local office</p> <p>1.2 Kick-off workshop jointly organised with Kendat-led project</p> <p>1.3 Baseline study using participatory and quantitative techniques</p>			<p>Counterpart organisations are willing to collaborate in research programmes.</p> <p>Extension services and NGOs assist with field surveys</p>

<p>2.1 Workshop jointly organised with Kendat-led project to present results of baseline study and select means of transportation to be tested and validated</p> <p>2.2 Action-research type Testing and validation of Intermediate Means of Transportation (this includes PRA)</p> <p>2.3 Study using participatory and quantitative techniques on social, technical and economic aspects (This includes PRA and statistical survey)</p>			<p>Counterpart organisations are willing to collaborate in research programmes.</p> <p>Counterpart organisations are willing to collaborate in research programmes.</p> <p>Extension services and NGOs assist with field surveys</p>
<p>3.1 Workshop jointly with Kendat-led project to present findings of the research</p> <p>3.2 Publication, dissemination, and networking activities</p>			

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Appendix 4

Mustapha Benmaamar

Transport Research Laboratory,
TRL Limited

TRL

- UK Transport organisation
- Established 60 years ago
- World leading organisation in transport research
- 550 employees
- 4 divisions
- I work for the International division with 50 other colleagues

Area of work

- More than half of our projects is funded by the Department for international Development (DFID)
- Low volume roads, transport services, mobility and livelihood and rural transport development research projects

TRL contribution to the project

- First of all learn from your experiences
- Contribute to the Participatory Rural Appraisal (Market research) and
- Analyse the cost and benefits of different scenarios for the development and promotion of IMTs

Factors contributing to transport costs

- Type of commodity (perishable or not, voluminous or not)
- Load and distance traveled
- Nature of marketing system
- The efficiency of transport system

Project background

- African farmers receive only between 30-50% of final market prices
- While
- 70-85% are received by Asian farmers with most of the difference going to transport costs

Characteristics of market and storage accessibility in Africa and Asia

	Ghana	Pakistan
Typical distance to the nearest market or storage	> 20 km	5- 20 km
Market access to farmers	Poor- market women have all marketing contacts	Good
Farmers ability to transport own produce	Farmers have little mobility	Good
Reliance on traders	Almost complete reliance	Very little

Scope for reducing transport costs

- One of the most effective ways that farmers have of getting the best price for their produce is for them to sell it themselves directly to final consumer at rural or urban market
- HOW?

Benefits of IMTs

- The use of animal cart instead of headloading plantains generate savings of 41 US/ha (72,000 UGSh). The use of ox cart increase income by 60 US\$/ha (110,000 UGSH.)
- IMT can increase the cultivated area (production) to a radius of 20 km around markets and depots (e.g. Zambia)

Ergonomics by Mr. Dave O'Neill, Silsoe Research Institute

Ergonomics

The effective and efficient use of human and animal energy (together and separately)

1. Designing for people:

- **Performance**
- **Safety**
- **Comfort**

Performance

- **Productivity**
- **Output**

Availability and appropriate application of energy, time, knowledge and other resources

Safety

- **Accidents**
- **Injuries**
- **Diseases**

Design of the human-machine interface, and effects of environment

Comfort

- **Size**
- **Shape**
- **User-friendly**

Anthropometry, biomechanics, gender differences

2. Livelihoods:

Main concerns are HUMAN and PHYSICAL capitals (and their interactions) but SOCIAL capital is relevant for management issues and NATURAL and FINANCIAL capitals for resources issues.

3. The application of these concepts to the ART Project:

- **Porterage**
- **DAP**
- **IMTs**
- **Marketing**
- **Packaging**

Within the context of the prevailing *farming system* considering human, animal and engine power sources as complementary (not in competition).