

Constraints to utilization of draft animal power technology at farm level in Uganda

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Abstract

Animal traction utilisation in Uganda dates back to 1909 when it was introduced in the then Bukedi district in eastern Uganda. Despite its long stay in the country, the technology is still only being used for land opening, and is to this day being extensively used only in the Teso farming districts east of the country. A study was undertaken among known experts in animal traction as well as selected draft animal power practicing farmers in each of the districts of Katakwi, Soroti and Kumi to identify and define constraints, causes and effects, gaps, opportunities on Draft Animal Power (DAP) utilisation and chat a way forward. The study broadly categorized the constraints in DAP utilization as technical, animal health and nutrition-related, economic, social and environmental related. On ranking these constraints, farmers' main concerns (highest to lowest) were: inadequate knowledge and skills on the use and management of DAP implements and work animals, lack of appropriate DAP implements for row-cropping, weeding, rural transport and for harvesting and processing of selected crops and finally inadequate availability of DAP implements spares, repair facilities and services in rural areas. Farmers' proposals for the way forward therefore included massive training of trainers and farmers on DAP utilization and management, and of local artisans on fabrication of spares for the DAP equipment. The systematic training would result in both technical and managerial skills enhancement and also provide required repair service capacity in rural areas. A range of DAP implements for different farm operations as prioritized by farmers are vital for enhanced productivity of labour, land and livestock at smallholder level. The above challenges are currently receiving systematic redress by the national agricultural research system and other partners in Uganda.

Key words: Artisans, farm implements, farm power, trainers

Introduction

Some 400 million beasts of burden throughout the world, still work for man today. They contribute more than half the energy the Third World uses for agriculture and provide some developing countries, especially the semi-arid and highland zones, with as much as 90% of their agricultural power. However, in addition to providing energy to farm operations (primary input function) work animals also fulfill an important output function by providing meat, milk, hides, manure and income. They are therefore a vital asset in enhancing the productivity and stability of smallholder farming systems.

An appraisal report by a committee of experts in Agricultural mechanisation in Africa (Mrema, 1992) shows that the African region is the least mechanised in the world, with only 16% of farm power available provided by draft animals. In Uganda, the contribution of animal power is estimated at only 8-9% (Odogola and Kibalama, 1997). The low deployment of mechanised power in farming explains the current low cultivation of only 5.2 million hectares (30%) of the 17 million hectares classified as potential agricultural land in the country, (MAAIF/MFPED, 2000).

In Uganda, the use of draft animal power started as early as 1909 in the then Bukedi (Tororo) district east of the country (Akou, 1974). Despite its long stay, the technology is still only being used for land opening, and is to this day being extensively used only in the Teso farming districts east of the country. Earlier attempts to introduce a range of implements for different farm operations through demonstrations, giving out as prizes at agricultural shows and ploughing matches did not yield much. At smallholder level, farm operations countrywide have continued to be carried out largely using human power based on rudimentary tools and contribute over 90% of the farm power needed (Odogola, 2001). This investigation provides useful information for the enhanced reduction of drudgery, improvement of the quality and timeliness of various farm operations and performance of agricultural tasks with a view to improving productivity.

The study was carried out in the districts of Katakwi, Soroti and Kumi among known experts in animal traction as well as selected Draft Animal Power practicing farmers. The purpose of this study was to identify and define Draft Animal Power (DAP) constraints, their causes and effects, gaps, utilisation opportunities and chat a way forward.

Methodology

The sample in this study was selected from among known experts in animal traction as well as DAP practicing farmers in each of the three target districts above. Grass root DAP farmers (male and female), expert DAP farmers (male and female), civic leaders, farmers with disabilities, youth, district extension staff responsible for DAP, DAP experts from various organizations (NGOs and CBOs), rural blacksmiths, researchers and manufacturers on DAP technologies formed the target group for the study. Multistage and purposive sampling techniques were used to select the respondents. The sample included 90 DAP experts, 30 (20 men and 10 women) per district.

The instruments used in the study to gather information included participatory methods through working groups, group interviews, visualization with cards, scoring, ranking, iteration, moderated dialogue and plenary session. The meetings were guided by well planned and defined tasks coupled with good moderation and facilitation.

Two days expert diagnostic and planning meetings were conducted twice in each of the three districts in 2003 to discuss DAP utilization constraints at farm level, causes and effects of problems and their impact on DAP utilization, gaps, opportunities and way forward. Tasks were set out to the participants in smaller groups and to complement the group discussions, plenary sessions were held to review progress and discuss group findings.

Participatory methods through working groups and visualization techniques were used to analyze DAP resource constraints of farmers and opportunities at household level. Cause-effect relationship of problems (problem tree) was used to clearly understand their impact on DAP utilisation. Overall ranking was used to analyze priority crops and main production constraints by priority crops.

Results and Discussions

Priority crops grown by districts

Participants first identified five priority crops in their respective districts. The most important crop by the community was scored 5 while the fifth important crop scored 1. Fig 1 shows details of the scores per district per priority crop. The overall priority crops for the three districts were obtained by summation of individual district score for a particular crop. From the synthesis, the overall rankings of priority crops grown in order of importance, for the three districts were groundnuts, cassava, sorghum and millet and sweet potatoes.

Main production constraints by priority crops

Table 1 below shows the ranked production constraints of various agricultural operations according to their level of severity and by major crop types. In this respect, the most strenuous and time consuming operations in groundnuts production were hand planting in rows followed by harvesting, land preparation and transportation and processing within the farm. Main constraints in cassava production in the three districts were in transportation and processing. For millet the most strenuous operation was opening-up of land (considering the absence of cotton in the farming system), followed by weeding using tiny hand held tools. The other labour intensive operations shared by both millet and sorghum were harvesting, transportation and processing. For sweet potatoes land preparation, transportation and storage posed biggest problems to farmers. For the five priority crops in the three districts production was heavily based on rudimentary hand tools save for animal traction technology used only in opening – up of land.

Current practices and proposed technologies for farm activities

Analysis of current farming practices by priority crop enterprises within the three districts revealed that production was heavily based on rudimentary hand tools save for animal traction technology used only in opening–up of land. Storage of priority crops was mainly in bags as this was so because of fear of loosing the crops through theft. Marketing of priority crops was mainly done individually. Table 2 below shows current and proposed technologies for farm activities.

Proposed improved technologies by the three districts indicated the desire to move full blast towards diversified use of animal traction in various agricultural production operations. The pair-wise ranking conducted by the three teams prioritized DAP technologies for weeding as top priority followed by technologies on-farm transportation, planting cereal, legume and oil crop seed and harvesting of groundnuts, millet and sweet potatoes in that order.

Main constraints in DAP Utilization

Using the constraint analysis tool, the overall main constraints in utilisation of draft animal power technology were identified and categorized as technical; animal health and nutrition related, economic, social and environmental related. The following are the details.

a) Technical

- Unavailability of appropriate DAP equipment
- Inadequate skills and knowledge on DAP utilization
- Inadequate manufacturing and fabrication capacity
- Lack of sustainable repair and maintenance services

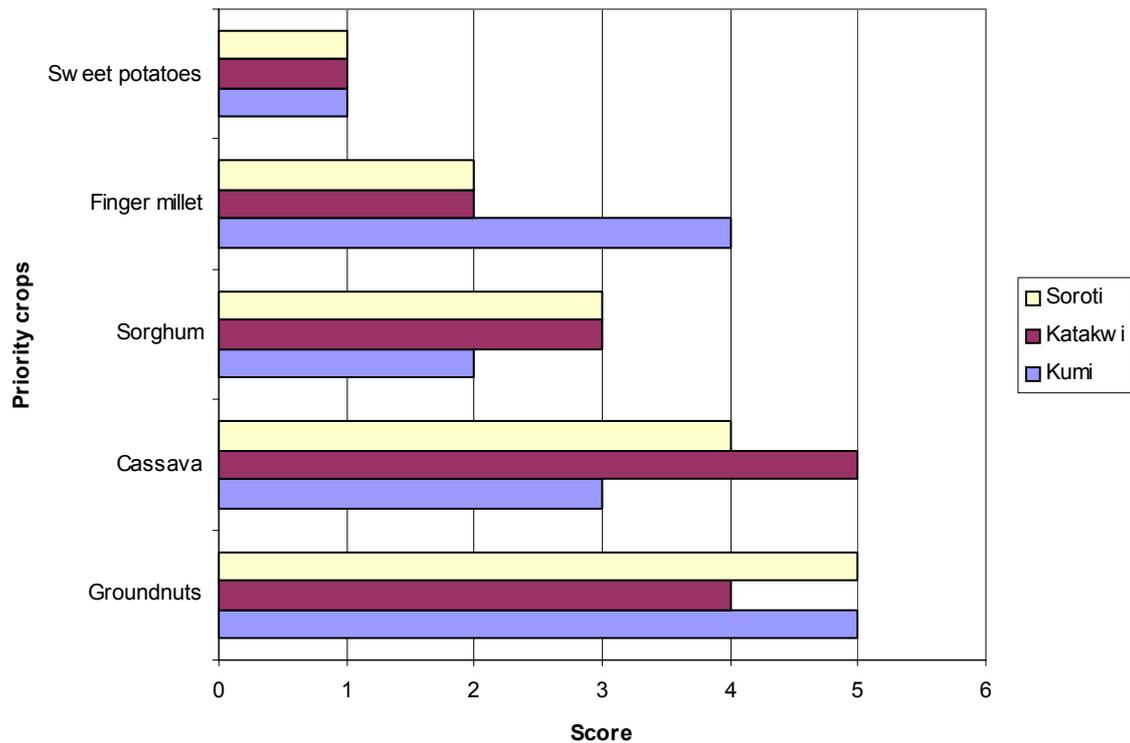


Figure 1: Priority crops by districts

Table 1. Main production constraints by priority crops, ranked

Ground nuts	Cassava	Sorghum	Finger millet	Sweet potatoes
❖ Hand planting in row	❖ Transporting bulky tubers	❖ Opening up of land	❖ Opening up of land	❖ Land preparation
❖ Harvesting	❖ Processing	❖ Row cropping	❖ Row cropping	❖ Hipping mounts
❖ Land preparation		❖ Weeding	❖ Weeding	❖ Transportation of tubers
❖ Transportation		❖ Harvesting	❖ Harvesting	❖ Damage by storage pests
❖ Shelling		❖ Transportation	❖ Transportation	
		❖ Threshing	❖ Threshing	

Table 2: Current practices and proposed technologies for farm activities

Farming activities	Current practices	Proposed technologies
Opening up of land	Hoe & ox-plough	Animal-drawn plough
Planting/sowing	Hoe, broadcasting	DAP planter, CA planter
Weeding	Hand-held knives, hoes	DAP weeder
Pest management	Applying with leaves, Knapsack sprayers	Hand-push or DAP sprayer
Harvesting	Hoe, knives, sticks	DAP-drawn harvesters
Transportation	Carrying on head or back	Hand-pushed & DAP carts
Processing	Manual & hand tools	Improved ph equipment
Storage	Bags	Improved granary, silo, crib, ware house
Marketing	Individually	Marketing groups

b) Animal health and nutrition

- Poor management and care of work animals
- Prevalence of livestock diseases and pests
- Poor medical attention to animals
- Inadequate water and pasture for DAP animals

c) Economic

- High cost of DAP implements, spares and work animals
- Lack of credit facilities for acquiring DAP inputs
- Low household incomes to effectively handle DAP requirements

d) Social

- √ Inadequate awareness of the benefits of DAP utilisation
- √ Negative cultural norms by some communities on DAP use
- √ Low attitude to change to new methods like DAP use
- √ Cattle rustling and theft in some districts

e) Environment

- √ Tall vegetation with tough roots
- √ Rocky and hilly areas making DAP use rather difficult
- √ Heavy soils calling for large and specialized animals
- √ Severe drought & diseases, narrowing areas for DAP utilisation

Main stakeholders in DAP and their Roles

The main stakeholders in DAP identified include among others farmers, service providers, Non Governmental Organizations (NGOs) and Community Based Organizations (CBOs), manufactures (formal and informal), financial institutions, policy makers, extensions agents and researchers. Table 3 below show respective stakeholders and their roles.

Ownership, use and management of DAP implements is the major role of farmers. Training in DAP technology is one of the roles of private service providers, NGOs, CBOs, Extension agents and researchers. Dissemination and promotion of DAP technology is carried out by NGOs, CBOs, agricultural extension agents, other private service providers and researchers. Policy Makers have a sole role for development of policies related to DAP. Researchers in partnership with farmers and extension agents develop and disseminate appropriate DAP technologies.

Farmers immediate concerns

In light of the above-identified constraints, farmers' immediate main concerns were:

- a) Inadequate knowledge and skills on the use and management of DAP implements and work animals
- b) Lack of appropriate DAP implements especially for weeding, row-cropping, rural transport, and for harvesting and processing
- c) Inadequate trained personnel to train farmers and their work animals
- d) Inadequate availability of DAP implements, their spares, and repair facilities and services in rural areas

Table 3: Major roles of stakeholder in DAP

Main stakeholder in DAP	Major roles of stakeholder
Farmers	◆ Own, use and manage DAP implements & animals.
Service Providers	◆ Provide Grants to farmer fora for technology development and transfer, Training, purchase of Agric inputs including implements and for contracting priority services.
NGOs & CBOs	◆ Disseminate DAP and other technologies through training
Financial Institutions	◆ Provide loans to farmers, rural blacksmiths and monitor proper utilisation of funds.
Extension Agents	◆ Disseminate and promote DAP technologies through training.
Researchers	◆ Develop and disseminate appropriate technology in partnership with farmers and extension workers
Manufacturers	◆ Manufacture/fabricate appropriate implements and their spares
Policy Makers	◆ Marketing and distribution of the implements and spares
	◆ Develop and implement policies related to DAP.
	◆ Monitor implementation and resource use.

- e) Inappropriate policies in promoting DAP-technology

Proposed interventions

Farmers' proposals for the way forward included massive:

1. Training of Trainers on DAP utilization and management
2. Training farmers on DAP implement utilisation and maintenance
3. Training rural artisans on fabrication of spares & repair of implements
4. Research to develop and chan out a wide range of appropriate DAP implements
5. Research linkages with manufacturers for technology scaling-up

Conclusion

The findings provide evidence that the constraints to utilization of draft animal power at farm level are diverse. However farmers immediate main concerns include inadequate knowledge and skills on the use and management of DAP implements and work animals, lack of appropriate DAP implements especially for weeding, row-cropping, rural transport, and for harvesting and processing, inadequate trained personnel to train farmers and their work animals, and inadequate availability of DAP implements, their spares, and repair facilities and services in rural areas. Systematic training of trainers, farmers, and rural artisans would result in both technical and managerial skills enhancement and also provide required repair service capacity in rural areas. A range of DAP implements for different farm operations as prioritized by farmers are vital for enhanced productivity of labour, land and livestock at smallholder level. The above challenges are currently receiving systematic redress by the national agricultural research system and other partners in Uganda.

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