

Draft animal power technologies: their scope and relevance to women farmers in Tanzania

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Introduction

Long hours labouring on farms using hand tools, and such related labour intensive technologies, to grow food for home consumption and local markets, cash crops, tending livestock and transporting, mainly head loading trekking from homes and farms, are basic tasks in the lives of rural women.

The level of mechanisation in Tanzania is still very low. It is estimated that 75% of the total agricultural labour is done manually, mainly by hand tools; while 15% is by draft animal power (DAP), mainly oxen ploughs, and 10% cultivated by tractors. DAP and tractors are mostly used in primary tillage and occasionally used for other farm operations. As a result planting/transplanting, weeding and transportation remain the limiting factors to increased farm productivity. Consequently, harvesting and post-harvesting activities such as processing are negatively affected.

The introduction of improved farming technologies has tended to bypass women. An attempt to encourage and increase access to use of and control of agricultural mechanisation technologies to alleviate women's workload is usually met by a number of setbacks. The most critical one, is the myth that women, especially from rural areas, are afraid of and have nothing much to contribute in terms of developing and spreading improved technologies.

Besides, in many traditions, women are not owners of big livestock such as donkeys and oxen which provide DAP for cultivation, processing and transportation. Lack of information and knowledge on existing technologies in the market, their operation and maintenance coupled with women's low purchasing power; seem to imply that "women" will remain to be a major source of "farm power" if no immediate interventions are advocated.

The commitment of the Government to improving the positions and conditions of women has led to widespread improvement more in some sectors than in others, particularly so in health. However, the burden of domestic work for most women combined with the need to engage in income generating activities and farming has negated the positive effect of these improvements. Women have less time for education, relaxation or for taking part in social and political activities, not to mention the time for making use of the available resources for health and development.

Calls for more attention to rural women activities have not been matched with the adequate priority and resources to the "Women's Desk" or even the Mechanisation Unit: itself within the Ministry of Agriculture! Many programmes designed for women are impractical particularly when they neglect to provide efficient technologies which minimise women's working days and encourage them to participate in other productive ventures.



Women with donkey cart carrying forage, Tanga, Tanzania

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The kind of DAP technologies needed for the development of women's capabilities and their full involvement in such technologies as those employed in agriculture are the main concerns of this discussion.

The scope of DAP technologies in Tanzania - The current situation

Though it is estimated that Tanzania has about three million oxen, only 870 000 are used, mostly for ploughing. It is also estimated that a total of 250 000 donkeys existing are mostly used for transportation, as pack animals and to a lesser extent for pulling carts. Their carrying capacity however, is more in pulling carts than when used as pack animals. Donkeys can also be used in carrying out other operations than just transportation.

Recently, water buffaloes have been introduced in the Usangu plains for paddy ploughing and puddling. The few horses existing are mainly used for riding and polo; their use in farming, if any, is not yet documented. There are 85 Animal Traction Centres in the country. It is expected that by the year 2 000, these centres will be strengthened and that each region will have a centre which is fully rehabilitated, serving as a resource base for other centres in the region. Land cultivated by DAP is expected to increase to at least 35% against the present percentage and hand cultivation reduced to 50%.

A total of about 290 000 animal plows are in operation. The yearly distribution of new plows in the country does not exceed 10 000 ploughs. In Usangu Village Irrigation Project, use of animal powered rotary paddlers has just been initiated. Likewise there are tillers, ridgers and cultivators. Given all these figures, one will have an impression that the use of DAP in Tanzania is quite advanced; although in regions such as Rukwa and Singida up to 75% DAP use, has been recorded. The actual situation is that DAP is limited largely to primary tillage only.

Mbeya region for example, has a total of 238 175 oxen that can be trained for farm work. However, a report from the Animal Traction Project at the Usangu Village (op. cit) cites only 5 700 trained oxen, 19 000 ploughs working only 35% of the total cultivated area. The implications of these statistics from a project with a "Women Component" - like the Usangu Irrigation Project, to women farmers are intriguing! It might be a matter of research to find technologies are utilised. If the deployment of DAP in such a project is insignificant, then this forum needs to propose ways of how to reduce women's workload through DAP, and how to popularise its use even outside project areas. Introducing technology to few groups is of little help, if the process fails to disseminate beyond the project itself.



Women riding single donkey cart, Tanga, Tanzania

Access to and use of DAP technologies by women

Ownership of big livestock by women is not very common, although in some projects such as Heifer Project International, women, individually or in groups own cattle mainly under "zero grazing".

Importation of machinery is possible through Open General Licence (OGL) and loans. As has been pointed out earlier on, these and other related terms like Letters of Credit (LC), are all "Greek" to many small-scale farmers - not just women. Therefore machinery imported into the country this way, remains to be private property and is disposable by dealers as desired.

Credit for the purchase of farm machinery is available with lending instructions; however the terms are commercial. Machinery is sold at an interest rate of 25%. Government subsidy is available in form of waiving of import duty and sales tax for all agricultural implements and related spare parts.

The Cooperative and Rural Development Bank (CRDB) which is the major credit supplier in rural areas; has a line of credit for the rehabilitation of agricultural exports. The Agricultural Export Rehabilitation Project administers credit for both traditional and non-traditional crops and considers both new and on-going projects. From its nature, the project is beneficial to those with foreign reserves, since its payment is in "convertible" currencies. Unless women engage themselves in export marketing, then they are not going to be the beneficiaries of this project.

Hiring of DAP even in cattle rearing areas is very low, currently (1992) - like tractor power it stands at Tanzania shilling (Tsh). 4 000 per acre (USD 4).

Machinery imported through grants are usually after project write-ups or project profiles. The Government sells project machinery to individuals, companies or cooperatives, thereby establishing a "Counterpart Fund" to ensure project sustainability. Grants also exist to few well organised groups by religious organisations mostly. In these revolving fund systems operates to enhance project sustainability.

Other factors affecting the use of DAP by women, is the time of operation by draft animals. The most convenient time for animals to perform, particularly primary cultivation is from 3 am. to 10 o'clock in the morning, after which the animals will be too tired to perform efficiently because of the heat. Considering women's daily chores, this timetable, especially the starting time, is not ideal to most of them. Women are found using DAP in puddling

and other operations in Mwanza and Shinyanga which do not necessarily have to adhere to the above timetable.

Masai women have proved an exception in the sense that they perform a number of operations using DAP. Some are known to cope up even with the 3 am. starting time routine. They also use donkeys for transportation - as pack animals though. Perhaps this deviation, might be due to the fact that, Masai are mainly pastoralists - so they are much more used to big animals.

Training and Extension

Support services such as management training and agricultural extension influence access to and adoption of DAP technologies by women.

Female participation in the 85 Animal Traction Centres is negligible. In cattle rearing areas, participants are those who own animals or those engaged in DAP projects. According to the preceding discussion, these are mostly male farmers. Women have access to DAP mainly by hiring, so some do not consider ox-training necessary although they are the ones feeding and taking care of these animals. Ignorance of the existence of such centres and projects also influences their use of this technology. Social factors including permission from husbands, influence women's attendance to training. Consider the fact that all trainers in these centres are invariably male.

The ten year Animal Traction Centres Project intends to intensify training in its centres and village demonstration plots to complement the mobile training and the training of 50 000 pairs of animals a year. These coupled with the proposed activities of the newly established Animal Traction Steering Committee, might perhaps bring an accelerated DAP technology development in the country by the end of its phase in 1995/96.

In the same vein, extension services are inadequate; save for special projects where women organise themselves and own DAP technologies such as Mbeya Oxenization Project and Korogwe - Wanyama Kazi to name only a few. Ways need to be proposed of the most appropriate solutions to technological constraints women encounter in the field. While at present emphasis is more on production and transportation; diversification of DAP to include such tasks as fertiliser and pesticides application, processing as grain milling and oil expelling, conservation and water pumping would benefit more women.

Extension is responsible for the dissemination and popularisation of these technologies and which animals are to be used for which tasks. Soil

degradation has occurred in some areas because oxen have been used to pull sledges for transportation instead of improved designs of animal carts. Farmers need to know the relationship between ecological factors and the use of animals. Like for example, it is more appropriate to use donkeys in hilly areas than oxen because of climate and their difference in draft power.

Training and visit and women's DAP technology projects

The sustainability of DAP technology projects depends on a number of factors. For the purpose of this discussion, only the level of skills i.e. (education and training) and stable forms of organisations will be considered as sociological and ethnological factors. Adequate infrastructural support such as credit and/or subsidy programmes marketing services, the supply of agricultural inputs and acquisition of production resources such as land and animals will fall under economic and institutional considerations. In an attempt to increase their productivity, women are confronted with a number of constraints including social customs that restrict their ability to undertake certain productive ventures and limit their access to production resources, lack of technical and business education among many others.

Various forms of knowledge on how to gain access to production resources, increase their productivity and engage in income-generating activities. These range from legal education, skills development, managerial awareness to training in proper husbandry practices which is product centred and encourages better production. Such training however, must involve a package of actions that should ensure learning, stimulate motivation, reinforce creativity, improve women's ability to take risks and instil confidence in themselves. Women therefore, need multidimensional training in order to fulfil the above prerequisite. This will inevitably have to impact organisational techniques, management training and education for consciousness raising.

Extension systems fare well in increasing productivity and efficiency, but they can not give people land for example. How then can training and visit (T&V) cater for animal provision and implement acquisition by women? In order to operate within economies of scale, DAP technologies have to be used communally or in groups. Another issue at stake is who should formulate these groups. Should extension form them or should it work with existing groups - lest they should turn into pressure groups! Has the extension, the time and the techniques to impart education for consciousness skills for example? An extension agent is supposed to be a friend to the farmer. The question of loan repayment

by farmers is contrary to that attitude. Apart from lack of awareness of credit acquisition procedures by most agents; due to nature of their training - the basics of T&V do not encourage credit and input provision to farmers. Not to mention marketing of surplus produce resulting from the efficiency of the system. In order to bring a favourable balance in female DAP technology projects, a "mixed grill" of extension methodologies need to be adopted. Such that T&V for animal and fodder production and veterinary services; group-participatory extension methodologies for other remaining activities. Groups need to be self-sustaining and permanent to have an identity which is the first stage to obtaining legal status and societal protection. Group sustainability and viability effectively increase women's bargaining power and influence which are necessary to meet credit requirements of lending institutions and increase women's credibility. Another concern is how to develop within groups a leadership potential capable of leading, of seeking membership interests and of acting as spokesperson when need arises. An extension-training programme with such complementarity of extension methodologies might prove successful in bringing sustainability and institutionalisation of DAP technologies in the country.

Conclusions and suggestions

In view of the difficult situation of women in farming, it is deemed urgent to improve their condition by decreasing their drudgery. Substituting the use of hand tools and other inefficient production, processing and transport technologies by the more advanced, functional, adaptable, accessible and controllable ones, should be given a top priority.

This will involve the promotion of technologies that women need and are mostly likely to use; those which are geared towards improving family living conditions and those directed towards income generation. DAP, drainage and irrigation techniques, the facilitation of access to improved production inputs and other proper husbandry practices will have to go "hand in hand".



Women weeding, Zimbabwe

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DAP technology projects should therefore diversify their range of activities. It is meaningless to expand acreage by DAP and applying fertiliser in the same field using a 10 gram match box for example. At the same time to expect the same members of the household to trek distances in search of water and firewood after having bent their backs up and down, countless times in the process of fertilising.

Weeding is a critical constraint to maize production in the southern highlands. However, when done timely twice or thrice, hand weeding has controlled weeds effectively. This task is mainly done by women, although it is said that in Tanzania weeding requires 300 to 400 "man" - hours per hectare (sic!). The use of DAP in weeding will significantly reduce one obnoxious drudgery in farming.

The issue at stake however, will still be **ownership** and **control** of DAP technologies. If these will still be male dominated or taken over completely as is usually the case with newly introduced, easily operated, efficient technologies - a number of undesirable repercussions will have to be anticipated. Unequal distribution of net - benefits, an increased acreage to be hand-weeded and the deprivation for wage labour in farms for those who will own and control DAP technologies are among the few consequences worth mentioning.

On-Farm Research (OFR) aimed at identifying viable technologies adoptable to local conditions is therefore recommended. The adaptive research should reveal technologies geared towards eliminating constraints with target groups; i.e. male vs. female, small vs. large-scale farmers, and urban vs. rural communities.

Effects on labour patterns in households or projects should be established as these might have some important bearing on DAP technologies. The use of cultivators for example, reduce the labour input in the hand-hoe system by 80%. However, in order to maximise yield, these cultivators need to be supplemented by the hoe. In such a system - both male and female labour patterns should be clearly understood.

Management of DAP technologies involves both risk and big capital expenditure. Research needs to establish the economic viability of their use under different farming conditions. The profitability of animal traction has to be quantified and its long term economic benefit should be known. If this is not done, hiring charges for DAP will be a bottleneck thus hindering women's access to it and affect the distribution of net benefits.

Protection of land worked and livestock tended by women and more fundamentally a revision of

culture and civic law of those tenure systems which exclude women from ownership of production resources, is one issue very pertinent to the accessibility to DAP which need to be redressed.

It is in this regard that, Animal Traction is recommended to utilise a "Package versus Isolation" approach. A farming system multi-disciplinary strategy whereby researched objectives and target groups are clearly singled out within each ecological zone need to put into practice. These and other issues discussed above need to be addressed; lest we should have a number of well written projects doomed to failure.

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