

Constraints and opportunities in the transfer of draft animal technologies in Zambia

by

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Abstract

Technological advancement proceeds in two stages: the technical and highly scientific design and construction or development of a technology; and the adoption and integration of that technology by the community or system for which it is meant. Different farmers react differently to new technological innovations, and promoters often have their own ideas of the value of innovations. This paper focuses on the adoption and integration stage. It broadly analyses and exposes various non-technical constraints and opportunities in the promotion (transfer) of agricultural technology in general, and animal draft technologies in particular, within the context of a Zambian smallholder subsistence farming system. Factors discussed include national agricultural policies, credit and marketing facilities, extension services and strategies, and support services, such as veterinary services.

Introduction

During the past decade there have been considerable changes in the orientation and priorities of Zambia's agricultural policies. One area where such policy changes have occurred is in the field of farm power and, hence, farm mechanisation. Agricultural engineering policies have drastically changed with regard to input innovations.

As a result of government policy on smallholder farmers' power sources, enormous human and financial resources have been mobilised, at various levels, to mount an integrated effort for the realisation of effective and efficient use of animal power in farm operations. In this pursuit, which has involved foreign and local funds channelled through government and non-governmental organisations, one important problem identified has been the actual transfer of the technology. Most of the strategies and methodologies employed to promote the sustainable transfer of the draft animal technology have been inappropriate.

Research work has mainly been directed towards design and manufacture of implements—perfecting the “technical element”. In general, this effort has been successful. Unfortunately, the same cannot be said when appropriateness of such technologies to

intended beneficiaries is considered. Getting a technology appropriate and acceptable in a given farming system is an issue often taken for granted or simply overlooked. Often design and manufacturing of technology and designing and planning of developmental innovations have been based on vague and over-simplified views on what beneficiaries require.

Unlike technical design and construction work, the “laboratory” and field for transfer of an agricultural technology are highly complex, dynamic and quite unpredictable, with some factors, such as climate, being completely uncontrollable.

Farmers' reality

For many small-scale farmers the bottom line of their activities is survival. This means that their decisions on cropping patterns, implement choice, etc, are essentially based on risk avoidance. Because they have very little control over either their economic or natural environments, extremely limited alternatives exist for them.

Production strategies and situations are highly community oriented. It is a highly vulnerable community. Farmers' lack of reserves for coping with crop failure, the death of an animal, sudden input price increases, etc, only serves to perpetuate their poverty and misery. These are people whose economic decisions operate mainly within the concept of what some scholars have referred to as the “economics of affection”. Farming and many other activities in these communities are family affairs. Most of these farmers are essentially agriculturalists, often with little or no incentive to grow more than for their own subsistence needs.

In Zambia, as in other Third World countries, the concept of a monetary economy is relatively new in the subsistence farming systems. The same applies to the use of commercial inputs, such as hybrid seed, inorganic fertilisers, etc.

There exist in these communities traditions and cultural practices to which their survival is

attributed. So anything that threatens this "base" without offering immediate tangible benefits and/or opportunities is viewed with much suspicion which can only guarantee its rejection.

Most farming households in the southern part of Zambia are traditional cattle keepers. However, until very recently, for many of these farmers cattle have primarily been kept for reasons other than draft.

The northern half of the country is traditionally a non-cattle-keeping area. Therefore, promotion of animal power in this area also entails introducing cattle keeping to these people.

Over the years, smallholder and subsistence farmers have been subjected to many "development efforts". Unfortunately, most of these efforts have been designed and implemented without the local peoples' consent, even less their participation.

Focusing on the farmer, and not on the technology *per se*, this paper broadly analyses the various parameters (subjective as well as objective) that hinder or offer opportunities for effective and sustainable transfer (integration) of draft animal technology in a Zambian small-scale subsistence farming community.

Accessible technology

One area that has to be addressed in a discussion on planning for transfer of a technology is farmers' accessibility to that technology. There are two aspects to this issue:

- physical supply and distribution (availability of the technology)
- monetary accessibility (credit).

Physical availability means the supply of implements and cattle and all other support services needed, such as blacksmiths, veterinary services, marketing systems, etc.

For many of Zambia's smallholder subsistence farmers, especially those in the northern half of the country where cattle keeping is a new phenomenon, it is becoming increasingly difficult to find animals (steers). In Mpika district of Northern Province, close to 40% of the approved oxen loans in the 1990/91 season could not be taken up because of the scarcity of steers in the area.

The supply and distribution of animal-drawn implements has been highly chaotic to say the least. Some efforts have been made (mainly by non-governmental organisations and project institutions such as the Smallholder Development Projects in Kabwe and Mpongwe) to "provide" the farmer, not only with the steers, but also with veterinary services, drugs and implements. Where

veterinary services have been part of the oxenisation programme, mortality has been greatly reduced. However, the sustainability of these projects (in the reality and circumstances in which they are operating) has yet to be assessed.

A technology transfer programme should, as a prerequisite, ensure that essential facilities are available and some practices such as dipping of animals, implement supply and repair are integrated in that community's system.

Extension staff and farmer training

Another factor that any technology transfer programme should address is appropriate training for both farmers and extension workers. Although there is no alternative to experience, training still remains indispensable. Lack of, or inadequate, knowledge and skills in draft animal technology among extension workers has slowed down and sometimes misdirected efforts aimed at promoting the technology.

The training of extension staff in Zambia, especially at higher levels (diploma/degree), is divorced from reality, making graduates unable to appreciate and realistically analyse the farmers' environment, especially its non-technical elements. Training of extension workers seems to centre more on changing the farm; they learn about soil use, plant varieties, fertilisers and animal nutrition. The farmer is only another "object". Also, agricultural training is so segmented that the notion of analysing farmers' problems in a holistic multidisciplinary manner is defeated. For those already in the field it is hoped that in-service courses, such as that being offered by Palabana Animal Draft Power Training Project, will help to redress the situation.

Transfer of draft animal technology will demand a perception and treatment of the farmers' reality as one system with various technical and non-technical factors interacting in a complex and dynamic manner.

On the other hand, we want farmers with "local" initiative and participation to appreciate and define their problems—in this case, farm power related problems (farm power limitations, the role and demands of animal power, etc). In the end it is the farmers who have to decide. Therefore, farmers' training should be characterised by extensive awareness campaigns which aim to "place the farmers" in consciously critical confrontation with their reality, to make them the agents of their own advancement.

Whereas short intensive courses are sometimes adequate, it is important to develop a continuous learning process in the field, with the integration of the technology in the socio-cultural fabric of the people with their full involvement and participation.

The extension system

The Zambian agricultural extension system, with all the characteristics of a government public service organisation—huge size, confused priorities, bureaucratic red tape, unmotivated staff, etc—struggles more to sustain itself than to address farmers' issues. Zambia has mainly used the training and visit system. It becomes obvious, from the operation of this system, that, as a system, it only vaguely understands the farmer reality. A lot of the recommendations promoted are more technically oriented, with very little regard for the farmers' needs and aspirations and other internal and external factors that influence the farming system. Identification of farmers' needs is often heavily biased towards donor and/or implementer preferences.

Promotion of animal power will be more realistic and effective when all such factors are given due consideration, in an integrated manner. This also entails supervision and back-up support for field extension workers.

Human resource development is often ignored in agricultural extension. Human resource development (community development, institution building, leadership development, mobilisation, organisation, etc) focuses on developing people themselves and not "developing farms through people" (Roling, 1988). The extension agents, and indeed their recommendations, must be oriented primarily towards the farmers' perceived problems, and not towards agricultural technology.

The strategies and methodologies employed in promoting draft animal technology messages and recommendations should take into account the fact that one is not starting with a "blank" farmer; the target group already has certain ideas and practices that should be acknowledged and respected.

Agricultural credit and marketing

Transfer of animal power technologies in the Zambian system would require a sound credit scheme and a stable and adequate marketing infrastructure. As mentioned above, the main target group for the transfer of draft animal technology is farmers whose farming has predominantly been subsistence; the money economy is a relative new phenomenon, with survival as the bottom line for all

the farmers' activities and decisions. Financial (cash or material) assistance should then be taken as essential, especially in the initial acquisition of the technology (animals, implements, drugs, etc).

The important word here is "initial", because although huge sums of money have in the past gone into loans to smallholder/peasant farmers, the general impact of these loans has largely been insignificant: farmers become perpetually dependent on loans.

Sound design, planning and execution of a small-scale agricultural credit scheme are essential if such a scheme is to be effective and successful for both the farmer and the lender. Ill-conceived, hastily planned and poorly implemented credit programmes not only lead to their own collapse, but also reduce the farmers to a state of dependence associated with loss of integrity and confidence in themselves and their system.

An appropriate draft animal technology credit scheme, like any other agricultural credit scheme, should be productive, appropriate, accessible to as many farmers as possible, cheap, self-sustaining and capable of being managed in the long term on local resources.

One of the greatest constraints for smallholder/peasant farmers in Zambia in the adoption of draft animals is the lack of capital or credit to buy the animals and implements, combined with lack of profitability of farming in general. For the smallholder farmer this has further been exacerbated in that the promotion of draft animal technologies has been more or less exclusively associated with the growing of maize which, for political reasons, has been the worst hit crop in terms of producer price.

On the other hand, credit programmes, in addition to their management and organisation problems, also suffer economic problems. Loan interest rates only go up to 50%, while inflation is well over 100%. This means that, in a given period, the lender makes a loss, even with all the loans recovered. This is especially so for medium-term loans; ox package loans are normally medium term.

This problem is complex, especially when factors that influence interest rates on one hand, and inflation on the other, are taken into consideration, particularly in Third World countries where inflation is very high and unstable.

Agricultural marketing infrastructure is another factor that can in itself greatly motivate farmers to adopt draft animal technologies. Apart from the supply and distribution of inputs, the farmer should

have the purchasing power (probably through credit) to acquire the inputs. The use of purchased inputs is closely linked with the availability of credit (Francis, 1988).

On the other hand, the farmer should be able not only to sell his or her produce, but to sell it at economically competitive prices. Because of the marketing arrangement and incoherent price policies that prevail in Zambia, what could have been the farmers' profit ends up in other peoples' pockets (middle men, consumers). Hence the farmer remains with no capital to re-invest in the farm, let alone repay the loans.

An agricultural technology transfer programme should ensure marketing efficiency. Apart from giving farmers a good price for their produce, better transport and handling facilities, cutting out some intermediaries, etc. are prerequisites. The broader aim should be to give farmers "power" to negotiate a fair price for their produce.

Policies

National agricultural policy has greatly influenced the advancement or non-advancement of the agricultural industry in Zambia. A major factor has been the pricing of agricultural produce and associated inputs. Unfavourable price ratios have rendered farming generally unprofitable.

One crop seriously affected has been maize. This is the crop that most small-scale farmers are growing, and so promotion of draft animal technologies has, consciously or unconsciously, been based on this important (staple food) but unfortunately commercially unprofitable crop.

In transferring animal power technologies we should be aware of the implication and consequences this might have on the community and its people. It is very possible that the consequences could out-weigh the advantages in using animal power. For instance, in cropping systems, destumping becomes essential (labour demand); it entails integration of crop and livestock farming and this may create tensions—increased plowed area, hence increased planting, weeding and harvesting jobs, etc.

Finally, it is increasingly being noted that factors hindering promotion and adaptation of animal power technologies lay primarily in the socioeconomic, cultural and political areas rather than in the technical elements of the technology. In particular, because the supply of implements is very limited, farmers have to take any implement that is

available, with little regard to its quality, construction, etc.

Animal power technologies, like any other agricultural technology, should be appropriate to the beneficiaries or users, and directly address the problem they are meant to solve.

Summary

For an animal draft power technology transfer programme to be effective, and to ensure increased agricultural production through appropriate and sustainable use of animal traction, it should fully involve the beneficiaries. The designing, planning and implementation strategies should fully acknowledge and address the situation and circumstances of the beneficiaries' reality.

Factors such as farmers' ability to understand and use the technology, management and organisation of agricultural credit schemes, training of both extension staff and farmers, organisation of the extension system, economic and political factors, etc. need serious consideration.

Agricultural and overall economic policies in Zambia have not been favourable for the farmers to appreciate and adopt more efficient and effective means of production.

The extension system has been more oriented to the delivery of technical messages (some of which even the extension workers themselves do not fully understand), with little or no regard for the needs and aspirations, let alone the reality, of these farmers.

Particularly for Zambia, there are broadly two main classes of farmer to which technology needs to be transferred. For those in the northern half of the country, strategies that stimulate and facilitate introduction of the technology could be most appropriate, while in the south the need is to improve the efficiency and effectiveness of the technology. However, each farming system should be assessed individually; for some farmers in the south, although they are traditional cattle keepers, the use of animals for draft is just as new a concept as it is for those in the north.

References

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