

# Promoting the Adoption of Animal Traction Technology in Nigeria: Some Relevant Issues

Akinwumi Omotayo and Park P. Idisi\*

## Abstract

*There is a growing current interest in promoting the adoption of animal traction in Nigeria. While considerable energy is being expended on promoting the adoption, some fundamental issues that may affect the rate, level, and sustenance of adoption of the technology are not being adequately addressed.*

*In the event of wide-scale adoption of animal traction in Nigeria, the present inadequate availability of animal feed will worsen; and an increased demand for workbulls will create further scarcity in the supply of animal protein. Veterinary services are presently inadequate and if there is no improvement may not be able to sustain the programmes of animal traction being promoted. Cost of acquiring the basic animal traction package stands at about N8,000. This, clearly, is not within the power of most small farmers to acquire. Implements are not in abundant supply and a considerable quantity of animal-drawn implements are being imported. This is not in consonance with our drive for self-reliance.*

*In order to derive maximum benefit from adopting animal traction on a sustainable basis, essential services in the area of equipment and spare parts supply, maintenance, animal health and nutrition, veterinary services, research, extension and training should be intensified. New frontiers for the adoption of animal traction especially areas where the technology has not been previously utilised, should be explored.*

*Youth clubs, cooperative groups and farmers' organisations should be given special attention in the promotion of adoption of animal traction technology in Nigeria.*

## Introduction

Draught animals were first introduced in the 1920s in the northern parts of Kaduna State and since then, their use has become widespread in the various parts of the tsetse-free savanna zones of Nigeria. The introduction was accomplished through the mixed farming system and a remarkable measure of success was reported to have been achieved. The success was attributed to:

- Extensive test evaluation and selection of imported draught animal implements.
- Ecological compatibility of the area with the use of draught animals.
- Efficient credit scheme.
- Extensive research, training and extension.
- Efficient health and veterinary service. (Musa and Oni 1983).

Apart from government efforts during the colonial period, some private voluntary agencies provided the impetus for adoption of the technology by establishing farmer training and workbull training centres. However, the vigour with which draught animal power adoption was promoted declined significantly in the 1970s when the campaign for increased food production favoured capital intensive tractor mechanisation approach. This approach failed to bring about the much desired increase in food production partly because the small-scale farmer was neglected in the scheme and because the tractors, implements and spare parts had to be imported with scarce foreign exchange.

The failure of this approach, coupled with the downturn of the Nigerian economy and a compelling need to meet the rising local demand for food, led to strident calls for a look inwards for a cheaper labour saving, and locally sustainable technology for agricultural mechanisation. Animal traction (AT) technology appears to provide a ready answer in this regard, especially for the small-scale farmer.

---

\*Department of Agric Economics & Rural Sociology, Ahmadu Bello University, Zaria.

The small scale farmer remains the major producer of food and cash crops in Nigeria. To him, the use of draught animals represents a substantial improvement over the traditional hoe method. The use of draught animals saves labour per ha, allows for expansion of areas farmed, improves the timeliness of planting, (Barret et al. 1982).

The increased awareness of the clear benefits of AT technology is, no doubt, responsible for the renewed interest in the promotion of its adoption in Nigeria.

### The Problem

While government and some international organisations have in recent times demonstrated considerable interest in promoting the adoption of AT in Nigeria, some fundamental issues that may affect the rate of adoption and sustenance of the technology are not being adequately addressed.

The use of draught animals seems to represent a step above the traditional hoe cultivation method and to be cheaper than the tractor. However, there is a need to critically consider issues that affect its prospects and likely resulting problems if we are to avoid mistakes that could hinder its sustenance. Sustainability should necessarily go beyond the continued use of the same tools every year. It must embody self-perpetuation and improvement on a continuous basis. In this sense, AT technology adoption must not be seen as representing an end to development in agricultural mechanisation for a category of farmers. Rather, it must be seen as representing a necessary and desirable transition from the present hoe cultivation system to a future higher technology which is symbolised, in our context, by the tractor. Therefore, the adoption of AT must be promoted in such a manner as to kindle creativity and innovativeness among the adopters.

### Present State of Draught Animal Adoption in Nigeria

The use of draught animal power has become a permanent feature of the farming systems of the northern parts of Nigeria in spite of the apathy towards its adoption in the 70s. In recent times, both the government and some international organisations have made significant efforts in promoting its adoption. Some World Bank assisted Agricultural Development Projects, particularly the Kano State Agricultural Rural Development Authority (KNARDA) have made significant investments in training workbulls, farmers and extension workers. KNARDA also has a workbull credit scheme for small-scale farmers.

The International Livestock Centre for Africa (ILCA) is currently introducing AT to communities that traditionally have not been using the technology in Nigeria. Also, ILCA, in collaboration with Ahmadu Bello University, Zaria, is intensifying research in AT technology. These joint efforts have, no doubt, stimulated a new wave of interest in the adoption of the technology by farmers.

Table 1 shows the widespread use of work bulls in the northern states of Nigeria.

Generally, cattle are used as a source of farm power in the northern states of Nigeria. However, current surveys reveal that the use of camels as a source of farm power is becoming more common in parts of Sokoto, Kano, and Katsina state. Donkeys are used generally for haulage of farm produce and manure. Most of the available literature on AT utilisation in Nigeria indicates that farmers have not taken full advantage of using work animals for the various possible farm operations. The use has been mainly for ploughing and ridging and on a limited scale, for transportation (Laurent 1968; Musa and Oni 1983).

**Table 1. The number of work bull owners in the then 10 northern states.**

State	Number of work bull owners	% of total
Kaduna	29,872	40.0
Bauchi, Borno & Gongola	21,000	28.1
Sokoto and Niger	10,000	13.4
Benue/Plateau	1,556	2.1
Kwara	50	0.4
Kano	12,245	16.0
Total	74,753	100.0

Adapted from Musa and Oni (1983).

## **Problems Likely to Hinder the Adoption and Sustenance of Animal Traction in Nigeria**

### **Feed Problem**

The problem of cattle feed has been with us for a long time. Pastoralists move seasonally from one part of the country to another. In the event of a wide-scale adoption, the present inadequate availability of animal feed will be worsened, especially during the dry season. Abundant forage which exists for animal consumption during the rainy periods is absent during the longer dry period. The present use of crop residues will become inadequate. An increase in the demand for feed will increase cost of maintenance, and dependence on dry grass will worsen the problem of wind erosion through over exposure of surface soil.

### **Competition for Human Protein**

Experts assert that the average protein intake in the third World is far below the recommended level. This is very true for Nigeria. Beef is one of Nigeria's most popular sources of protein. The annual beef market off-take is in the range of 9 - 10 % and is argued to be higher than the breeding rate. Therefore Nigeria periodically imports cattle from neighbouring Niger Republic. A mass adoption of AT without a good workbull breeding programme or improved meat production techniques will inevitably deplete available cattle protein for consumption.

### **Veterinary Services**

Veterinary services are presently inadequate nation-wide. The services are skeletal at best and limited mainly to the cities. The costs of veterinary drugs and other chemicals are very high. Without an efficient veterinary service in the rural areas, a sustainable AT programme will remain a mirage.

## **Rising Cost of Acquisition and Maintenance of Animal Traction**

### **Package**

Increased adoption implies increased demand for workbulls and implements. This will lead to higher costs particularly with the present shortage of breeding animals and galloping inflation in Nigeria.

At present, the average cost of acquiring a work-oxen package is about N8,000 without the cart (Table 2).

An increase in the demand for cattle for consumption and traction needs will escalate

package cost. Equally, insufficient numbers of local producers of implements will worsen the situation.

### **Inadequate Local Sources of Implements**

Apart from local blacksmiths only John Holt Zaria is a known industrial manufacturer of ox-drawn implements. In case of mass adoption, they will not be able to cope with the demand. This will lead them to increase prices, produce inferior tools, encourage imitation markets and disappoint farmers.

### **Importation of Implements/Work-bulls**

Quite a number of animal-drawn implements in the Nigerian market are being imported. This is not consonant with our determined resolve to embrace mechanisation technology that is locally sustainable and which can lead to self-reliance, and it clearly defeats our vigorous drive for backward integration both in the industrial and agricultural sector.

## **Suggested Strategies For Promoting The Adoption of Animal Traction Technology in Nigeria**

The available literature highlights the technical advantages of AT over the hoe method which provides a sound premise for promoting its adoption among small-scale farmers. AT allows the small farmer to expand the area of land put under cultivation and reduces the labour time required per hectare. For example, animal weeding is 3 times faster than hoe weeding (Barret et al. 1982). The use of AT can reduce substantially the tedium and drudgery often associated with hand cultivation. Also, some economic studies of the utilisation of AT indicate that cultivation with AT is cheaper than using the hoe or the tractor (Laurent 1968; Ogunbible et al. 1983).

However, to derive maximum benefit from adopting AT on a sustainable basis, factors that may limit the rate of adoption or the efficiency of utilisation must first be taken care of. Some suggested strategies are discussed under the following broad headings:

### **Services**

Services for a successful AT programme include timely supply of equipment and spare parts, maintenance and repairs, animal health and nutrition, research, extension and training. These services can be undertaken by private and government agencies.

Some experts are of the opinion that AT technology should be allowed to develop without

**Table 2. Total cost of acquiring a work bull package based on John Holt Nigeria Ltd. and Zaria local market price.**

Item	Price ₦	Cumulative Cost
Pair of oxen at N2,000 each	4,000	4,000
Plough	1,325	5,325
Ridger	1,325	6,650
Weeder	1,325	7,975
Others	100	*8,075
Cart	5,000	13,075

\* Cost of package without the cart is N8,075.

intervention. This, they argue, is possible given its social and economic profitability. However, with our peculiar situation in Nigeria, government intervention in the area of research, extension, and training is inevitable if adoption of the technology is to be sustained. Most government services that are relevant to this technology especially the veterinary and health services, must be overhauled for greater efficiency and to reach the rural areas.

#### Capital

Capital has been consistently identified in the literature as a potential obstacle to adoption of AT technology. Most small-scale farmers cannot raise the money for adopting the technology at the present estimated cost of N8,750 for the acquisition of the basic AT package. Although the promotion of AT has traditionally been directed at farmers who already own cattle, the other associated implements like the Emcot plough, ridger and weeder with the yoke for harness still cost as much as N4,075. It is therefore important that an efficient credit scheme be put in place wherever AT adoption is to be promoted. The credit could be in kind; implements can be supplied instead of cash.

#### Breaking New Frontiers

The promotion of AT in Nigeria should go beyond the areas of traditional utilisation. ILCA is blazing the trail in this direction by introducing AT into new areas in Nigeria. The government and non-government agencies should complement this effort by taking the campaign for AT to other parts of the country.

The humid zone for example, though tsetse infested, should be tried with the trypano-resistant N'Dama cattle for traction purposes. This has been tried successfully in some West African countries.

The N'Dama breed of cattle is said to be particularly suitable for traction purposes because of its body conformation.

#### Animal Breeding Programme and Grazing Reserves

To sustain the supply of workbulls locally without resorting to importation to meet demand, there is a need to undertake an efficient animal-breeding programme and establish more grazing reserves in different locations in the country. Government, farmers groups and other non-government organisations should pool resources together for this purpose. The issue of settling pastoralists should be given urgent consideration if the animal traction scheme is to succeed.

#### Youth Clubs, Cooperative Groups, Farmers Organisations

Special AT with youth clubs as target groups can go a long way in helping to promote the adoption of the technology on a sustainable basis. Youths generally are adventurous, innovative and risk-taking. Most adoption studies have found significant relationships between age and innovation adoption. In a study of the diffusion of the ox-plough innovation in Gongola State, Michaulun (1976) found that over 60% of the adopters were aged between 21 and 30 years, representing a youthful population. This group of farmers should therefore be prime targets especially where new frontiers are being explored for adoption.

Cooperative groups and farmers' organisation represent another target population to enhance the adoption and sustainability of AT in Nigeria. Such groups are capable of pooling resources together to provide credit facilities, own AT packages collectively, and share the risks inherent in the

adoption of the technology. Cooperative groups and farmers' organisation can also establish workbull training centres and provide other necessary services for members.

Government and other agencies interested in promoting AT in Nigeria should therefore encourage the formation of cooperative groups and farmer organisations to take an active part in this work.

#### Government Policies

The Government should pursue a coherent policy to support AT programmes to ensure a sustained

adoption. Policies that will ensure equilibrium of costs and benefits should be vigorously pursued.

#### Conclusion

We have reviewed the current situation of AT, examined the problems that are likely to impede sustained adoption, and offered suggestions for ensuring a sustained adoption of AT technology in Nigeria. The present attention being given to AT in Nigeria and the momentum with which its promotion is being pushed should not be allowed to decline if our dream of achieving self-reliance in food production is to be realised.

### Résumé

*L'utilisation de la traction animale suscite un intérêt croissant au Nigéria. Alors que des efforts considérables sont déployés pour promouvoir l'adoption de cette technologie, certaines questions fondamentales susceptibles d'influer sur le rythme, le niveau et la continuité de l'adoption de la culture attelée n'ont pas été abordées de manière satisfaisante.*

*L'adoption de la traction animale sur une grande échelle par les paysans nigériens risque de se traduire par une aggravation du déficit fourrager, alors qu'une demande accrue d'animaux de trait exacerbera les problèmes d'approvisionnement en protéines animales. Les services vétérinaires sont déficients; tant que des améliorations ne leur auront pas été apportées, ils ne seront pas en mesure d'appuyer les programmes de culture attelée qui auront été lancés. Les coûts afférents à l'achat du matériel de base de traction animale s'élèvent à 8 000 naira, ce qui met la culture attelée nettement hors de la portée de la majorité des petits paysans. L'approvisionnement en matériel agricole est insuffisant et un nombre considérable de machines à traction animale sont importées, une situation qui va à l'encontre de l'objectif d'autonomie poursuivi par le Nigéria.*

*Pour que l'adoption de la culture attelée permette de dégager un maximum d'avantages durables, il faudra renforcer les prestations en matière d'approvisionnement en matériels et en pièces de rechange, d'entretien du matériel, de santé et d'alimentation des animaux, de services vétérinaires, de recherche, de vulgarisation et de formation. Des pistes novatrices en matière de diffusion de la culture attelée devront être explorées, notamment dans les régions où la technologie n'a pas encore été utilisée. A cet égard, il conviendra d'accorder toute l'attention nécessaire aux clubs de jeunesse, aux groupements coopératifs et aux organisations paysannes.*

#### References

- Barrett, V., Lassiter, G., Wilcock, D., Baker, D. and Crawford, E. 1982. Animal traction in eastern Upper Volta: a technical, economical and institutional analysis. International Development Paper no. 4, Michigan State University, East Lansing, Michigan, USA.
- Laurent, C. K. 1968. The use of bullock power on farms in northern Nigeria. Bulletin of Rural Economics and Sociology, 3, 235-262.
- Michaulum, P.T. 1976. The diffusion of the ox-plough innovation in Longuda District of Gongola State, Nigeria. Occasional paper No. 6, Department of Geography, A.B.U. Zaria.
- Musa, H.L. and Oni, K.C. 1983. Prospects of animal draught power in Nigerian farming system. Proceedings of Agricultural Mechanisation Workshop, AERLS, p. 95.
- Ogunbile, A.O., Libura, J. and Abalu, G.I.O. 1983. Introducing available technology in boosting farms production. Proceedings of Agricultural Mechanisation Workshop, AERLS, p. 9-22.