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**THE USE OF ANIMAL TRACTION TECHNIQUES IN THE KOUANDE  
AND KEROU DISTRICTS, PROVINCE DE L'ATAKORA,  
REPUBLIQUE POPULAIRE DU BENIN**

**A Preliminary Report**

by

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**Contract AID/afr-C-1260**

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**April 25, 1977**

## INTRODUCTION

This short statement is presented in accordance with the terms of Contract AID/afr-C-1260. The component for which I am responsible calls for a report on the penetration of animal traction techniques in the survey area accompanied by recommendations for the agricultural extension service. The contract began on September 1, 1976 and this paper was called for at the six-month point. By means of explanation and as an introduction to this paper, I wish to point out that between the months of September and June no farming occurs, save harvest operations in which animal power plays a minor role.

The animal traction program in the survey area began with the crop season of 1970. The basic objective of the survey mandated by this contract was to determine how animal traction is currently being used in the survey area. That survey does not get underway until June of 1977. Consequently, the information and opinions set forth in this paper must be considered as preliminary and subjective.

The sources of information used to prepare this report are informal at best. I have relied on my experience in the survey area of four years as a Peace Corps Volunteer in the animal traction project, on my extensive travel in the area over the last few months in preparation for the survey, on the records of the Provincial Agricultural Service and on reports published by UNDP/FAO concerning their involvement in the project.

## ANIMAL TRACTION TECHNIQUES AVAILABLE

### Plowing

The plow available is a copy of the 10 inch mollboard plow "ARARA" manufactured by the SISCOMA company in Senegal. Originally the full range of equipment was imported from Senegal but it is now being manufactured here in Benin. Flat plowing is feasible, in most instances, after at least 40 mm of rain have fallen. Plowing at the end of the rainy season is possible provided that harvest operations are completed quickly. It is also feasible to do the initial plowing of new yam fields at this time.

### Ridging

A double-winged ridger is available which is also intended as a weeding instrument. The wings are adjustable. This ridger can throw up ridges up to 80 cm apart.

### Weeding

Originally, a 5-tine cultivator known as a "Canadian 5-dents" was available for weeding operations on the flat. This tool has since been abandoned due to its high cost and the availability of an alternative tool. The weeding tool promoted today (since 1972) is the peanut lifter. The peanut lifter is available with a range of blades (250 mm, 350 mm and 500 mm) which readily adapt themselves to the spacings of those crops grown in the area which are also grown on the flat. As stated above, for those crops which are grown on ridges it is intended that the ridger will be used as a weeding tool.

### Harvesting

The only crop for which animal traction makes a direct intervention at harvest time is peanuts (groundnuts). When peanuts are grown on ridges, the peanut lifter (mentioned above) is designed to dig the peanuts out of the ridge and expose them to the sun.

A secondary use of animal traction at harvest time is for the transport of the crop from field to homestead.

### Transport

Carts are available at an increasingly prohibitive price primarily due to the cost of wood. The basic cart model available is set on pneumatic tires and has a maximum net capacity of 500 kgs.

### Harrowing

From 1970 to 1972 attempts were made to introduce a locally-made harrow and demonstrate its usefulness, particularly on rice fields. To my knowledge, it appears that this tool and its use have been forgotten. It is no longer a feasible opportunity today.

### Seeding

In the early years of the project, some tentative attempts were made to introduce the use of seeders (primarily for peanuts and cereal crops) into the system. I have seen no evidence that this has been continued. The cost of the models available in Benin is high and my preliminary opinion is that the planting bottleneck is not serious enough to justify investment in oxen-drawn seeders.

### Drawing Water

Here again in the early years of the project, attempts were made to demonstrate the use of animal power in the cultivation of dry-season irrigated gardens. The animals were used to draw between 70 litre and 100 litre buckets for small (0.25 ha) gardens set up on furrow irrigation. In the Atakora Province, this potential use of animal traction found no adherents. However, in the north of the Borgou Province near the Niger River, this technique has shown considerable success.

### ACTUAL USE OF ANIMAL TRACTION TECHNIQUES IN THE SURVEY AREA

Given the preconditions set forth in the introduction of this paper, the observations in this section must be recognized as products of extensive familiarity with the area and not as a result of any objective census of farming practices in the area. That is the purpose of the farm level survey.

Perhaps the most serious weakness in the UNDP/FAO publications on the animal traction project in the Atakora Province is their lack of reference to what actually farmers do with their oxen. There is a tendency to imply, in their documents, that simply because approximately 400 plows have been sold in my survey area as of January 1, 1977, those plows are being used. This is particularly a dubious implication in the case of weeding tools. It just is not true. The extent to which this assumption is misleading will be ascertained by the farm level survey. This tendency to assume that simply because a farmer purchases a given tool he uses it for its intended purpose is not restricted to UNDP/FAO. The Agricultural Service as well as other international assistance agencies which have participated

in the project have made, at least implicitly, the same assumption. It is very misleading.

#### Land Preparation

The techniques that have been promoted for land preparation throughout the project have called for an initial plowing followed by ridging on those crops which are planted on ridges.

It is apparent that where actual plowing can be avoided, farmers will not plow. Cotton is normally grown on ridges. Farmers are much more likely to directly ridge their field without an initial plowing. The design specifications for the ridger was not intended to withstand the stress to the tool in ridging unplowed soil. However, in practice the ridger seems to suffer no serious damage. Since farmers must wait until at least 40 mm. of rain have fallen before the soil is loose enough to till, there is an impatience to prepare the seed bed. It is the rare exception where a farmer will initially plow a field where the crop is to be grown on ridges.

Cash crops which are grown on the flat will be plowed. This concerns primarily rice and in some instances cotton. Grain crops (millet and sorghum) rarely benefit from any land preparation. When enough rain has fallen, the field is planted.

One other land preparation technique which seems to be fairly widely used is in yam fields. Yams are always grown in large mounds; however in order to build the mounds the land must be initially plowed. This is usually done towards the end of the rainy season and animal traction is often used.

### Weeding

The use of animal traction weeding techniques is almost nonexistent. Despite the adaption of both the tools and the spacing of various crops, farmers in the survey area do not use their oxen to weed. The farm level survey should reveal the extent to which this observation can be generalized as well as hopefully uncover a rational explanation.

### Harvesting

Aside from the use of carts to carry the harvest home, animal traction's only other intervention at harvest time is to unearth peanuts grown on ridges. Where farmers grow peanuts on ridges, this technique is fairly generally practiced in the survey area.

### Transport

The primary use of animal traction for transport is to carry construction materials (adobe, rocks, straw, wood, etc.). A less important use of carts is for the transport of fire wood. In the early years of the project, every farmer purchased a cart along with his plow and other tools. In recent years this has somewhat diminished. The carts are quite expensive and have grown in cost faster than the other tools. It should also be noted that the first farmer to own a cart at the village level will have more transport work than he can handle whereas if there are five or six carts in the village, each owner will have to compete for the demand for transport. At the village level, the need for transport capacity can be quickly filled. Off-setting this aspect is the fact that the cart is a very visible status symbol whose importance should not be belittled. It is hoped that the farm-level survey will shed light on this phenomenon

and the extent to which it outways the economic liability represented by the high cost of the cart.

The above observations on the use of various animal traction techniques in the survey area are subjective. It is believed that the farm level survey will substantiate them. It should be underlined at this point that despite the apparent lack of penetration of the standard animal traction techniques into farm practices in the survey area, new farmers continue to purchase plows, ridgers and peanut lifters. For the 1977 crop season it appears that between 100 and 150 new farmers will start using animal traction in the survey area. This represents an increase in the neighborhood of 40 percent. This is all the more significant when one considers that the price of the tools (not including the cart) has increased 40 percent since 1970 and that the medium-term credit scheme has been discontinued. Consequently, despite the fact that the rather standard animal traction techniques have only been spottily adopted in the survey area, farmers apparently continue to perceive net benefits from animal traction in increasing numbers.

#### RECOMMENDATIONS FOR THE EXTENSION SERVICES

It can be argued that the primary roles of an extension agent, particularly in the context of Benin, are those of educator and facilitator. In both capacities, a great deal remains to be done in relation to animal traction. At this point, it is only possible to discuss deficiencies and needs in qualitative terms. With the farm level survey, quantitative weights can be attributed to the performance of the extension services.

The most serious deficiency among both agricultural and livestock extension agents is basic training (theoretical and practical) in the

animal-powered mechanisation of agriculture. In the survey area, farmers tend to have a great deal more practical knowledge about animal-powered farming practices, equipment adjustment and maintenance, choosing work animals, and on-farm husbandry of animals than the agricultural and livestock extension agents. The apparent haphazard and disjointed penetration of animal traction techniques can be, in part, traced to the fact that most farmers had little or no guidance when they started animal traction.

The economic impacts of this situation are primarily a wasteful investment on the part of the farmers in tools which are not being used to their full potential and by not using those tools to their full potential, and inability of farmers to take advantage of the possible yield effects of the full and proper use of animal traction techniques. It appears that animal traction has had an area expansion effect on the size of farms but particularly the lack of timely and efficacious weeding indicates that the possible yield effects are not being experienced.

As the extension and improvement of animal traction is a national priority, it would appear to be incumbent on the government to insure that village level agricultural agents have a thorough training in the principles and practice of animal traction.

A further difficulty in the agricultural extension service but one which is largely beyond the control of village level agents is the unreliability of the spare parts and repair system. Since the decision in 1972 to centralize manufacturing of equipment in the factor at Parakou, major sources of revenue for duly trained village level blacksmiths have been co-opted by the factory. Furthermore, primarily due to logistical problems, the factory and the Provincial Agricultural Services do not

appear capable of delivering adequate stocks of needed parts to the local level at the proper time.

Plow points, counter-plow points (contre-sep ?), ridger points and axles for the small guide wheel are the most commonly replaced parts. In the early years of the program these were being produced by village blacksmiths in Benin. There are serious shortages at the moment. Further evidence as to the viability of a locally-based network of blacksmiths can also be gained from the ARCOMA system currently functioning in Upper Volta.

The other extension service of major importance to animal traction farmers is the Veterinary Service. Sleeping sickness, Anthrax, peri-pneumonia, hoof and mouth, pasteurillosis are all endemic cattle diseases in the north of Benin, as well as intestinal parasites and the constant risk of snake bites. Here again the problem is largely outside the local level nurse's ability to solve. It is simply that the Livestock Service is not able to supply the local level with adequate quantities of the appropriate medicines at the time when they are needed. This represents a very high cost to not only farmers but also to the economy. A decent pair of working oxen can easily command a price of 100,000 CFA (408 \$US) at the Parakou beef market. Further south, the prices rise very quickly. The current cost charged to animal traction farmers for a full spectrum of prophylaxis (assuming the products are available when needed) is 1,000 CFA per pair of oxen per year (4.08 \$US).

### THE FARM LEVEL SURVEY

The observations made in this short paper are essentially subjective. The primary role of the farm-level survey is to provide a comprehensive and reliable data base on the current use of animal traction in the north of Benin. With this information, it will be possible to substantiate (or repudiate) the statements made above. Furthermore, it is expected that from a reliable information base it will be possible to develop concrete propositions for improving the use of animal traction techniques in Benin and the capacity of national agencies to supply the necessary services.

### CONCLUSION

To the observer, perhaps the most striking fact which stands out in the evolution of animal traction in the region is that farmers continue to switch from hand farming to the use of oxen in large and growing numbers. In what appears to be an atmosphere of very inefficient use of the technology and of poorly managed logistical infrastructures, farmers still determine that it is in their interest to invest in the technology. A rational explanation cannot be given without a strong base of information on the current use of animal traction in the region.