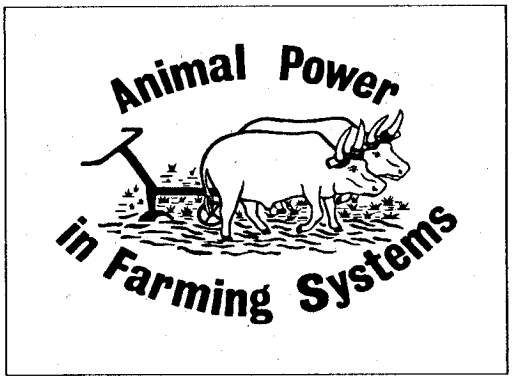
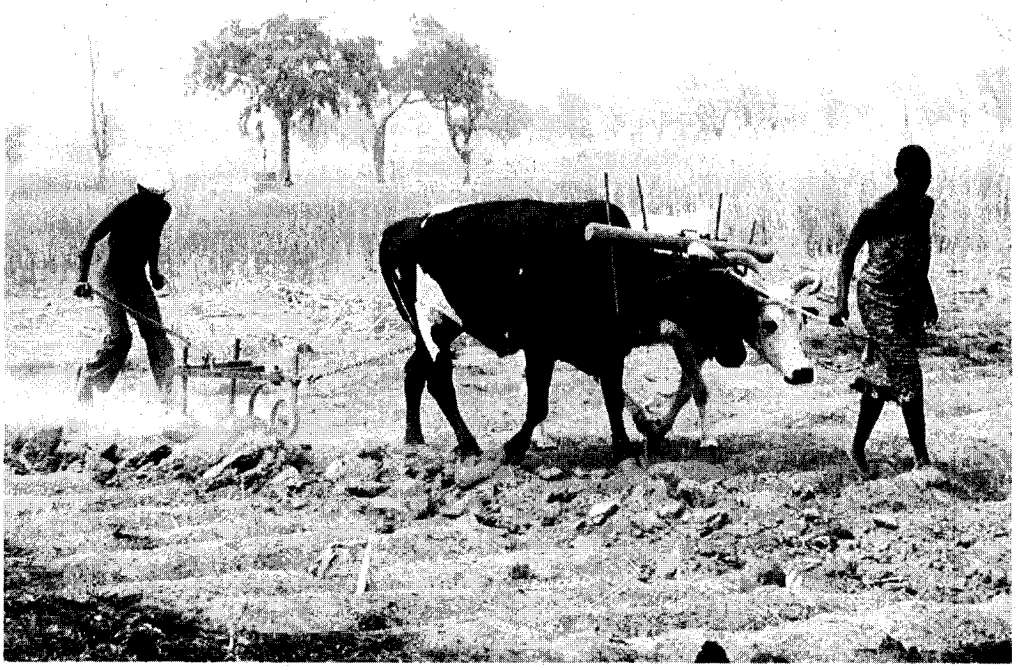


Animal Power in Togo



Title photograph (over)
Tine cultivation of old ridges using a "Triangle" cultivator at Broukou, near Kara, Togo
(Photo: Paul Starkey)

Features of animal traction adoption in Togo

by

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Introduction

The Republic of Togo is an agricultural country of 56,600 square kilometres located between Ghana and Benin on the West African coast. It is divided into five economic regions: Savanes in the far north, Kara, Central, Plateaux, and Maritime in the south (see Figure 1). An estimated 3.05 million people live in Togo, of whom 77%, or about 2.35 million, live in the rural sector. Of those in the rural sector about 43%, or 1.01 million, work in agriculture. Average agricultural-sector per-capita income in 1982 was 38,200 CFA or US$98 (IBRD, 1984).

The primary source of power in this agricultural sector is human hand labour, notably family farmers equipped with hoe and machete. When the 1976-77 government-sponsored effort to modernize agriculture using tractors failed, both development and political authorities concluded that another approach was needed. They turned to oxen power; that is, to animal traction.

This paper addresses several of the more prominent features of animal traction adoption in Togo today. After a brief historical overview, several specific factors which indicate the scale of animal traction adoption are presented. This is followed by a synopsis of the conditions which have contributed to the success of animal traction in the Savanes. The paper concludes with a discussion of several aspects of farm management involved in the transition from hoe to animal traction technologies in the Kara and Central Regions.

In 1986, the animal traction promotion project PROPTA (Projet pour la Promotion de la Traction Animale), in association with the Advanced School of Agronomy at the University of Benin (Lomé), sponsored a systems study of hoe and animal traction farming in the Kara and Central Regions and, more precisely, of the transition from one to the other. This paper benefits from some of the preliminary results of that study, results which should be of interest to participants in this Sierra Leone networkshop.

Historical overview

By the time the Togolese government came to select the animal traction policy option, animal traction was not new to Togo. Earlier, it too had been tried, had failed, and had been discarded. In fact, animal traction in Togo dates as far back as the German colonial era. In May 1900, the Berlin Colonial Economic Committee, in the hope of increasing cotton production, hired a team of black American experts from Tuskegee Normal Industrial Institute (Tuskegee, Alabama) to introduce animal traction in Togo (Kratz, 1982). Later, similar efforts were made in Mango (1908) and Tabligbo (1913). However, each effort failed to generate sustained interest by local farmers.

During the 1950s and 1960s several attempts were made to revive animal traction, primarily in the Savanes Region in the north. In the 1950s, animal traction was introduced at the Barkoissi School Farm and at an agricultural centre in Toaga. By the mid-1960s, a programme to introduce animal traction in the Savanes Region had been initiated by the

Togolese regional development administration (SORAD) and the French agricultural development organization BDPA (Bureau pour le Développement de la Production Agricole). These pioneering efforts, along with those already under way in neighbouring Ghana, began to effect a change in the way agriculture in this region was conducted. However when funding for the BDPA project came to an end, so too, for a time, did coordinated animal traction development activities.

The decade of the 1970s brought renewed and, finally, sustained interest in animal traction on the part of development agencies. In 1971, the American Peace Corps began an animal traction project in the Kara Region which has continued now for 15 years. The European Development Fund (EDF/FED) likewise has made a continuing commitment to animal traction development in the Kara and Savanes Regions. Furthermore, with the adoption of animal traction as a Togolese national policy objective in the late 1970s, interest in the technology accelerated; so much so that, by 1985, some 32 different development organizations were working with Togolese farmers to foster the adoption of animal traction.

In 1981, faced with this growing proliferation of projects, a national study and policy committee for animal traction programmes (known as COCA) was organized. This committee recommended the establishment of an executive body to provide the leadership and the direction required to transform the efforts and interests of the many individual animal traction projects into a more orderly and comprehensive national effort. This executive body, in effect the national coordinating administration for animal power technology, is PROPTA, created four years ago.

PROPTA, in addition to its purely administrative sections, has five technical divisions responsible, at the national level, for coordinating animal health, animal supply, animal traction equipment supply and development, technical training, and monitoring and evaluation activities. The authors of this paper work in the fifth division, Monitoring and Evaluation, itself created in September 1984.

Scale of adoption

Farmer adoption of animal traction technology is increasingly common in Togo today. The steadily mounting numbers of animal traction adopters is increasingly making this the technology of choice among Togo's progressive farmers. Their growing influence becomes all the more evident as one proceeds north through the country. In brief, animal traction is very important in the Savanes Region, but very marginal in the Maritime Region.

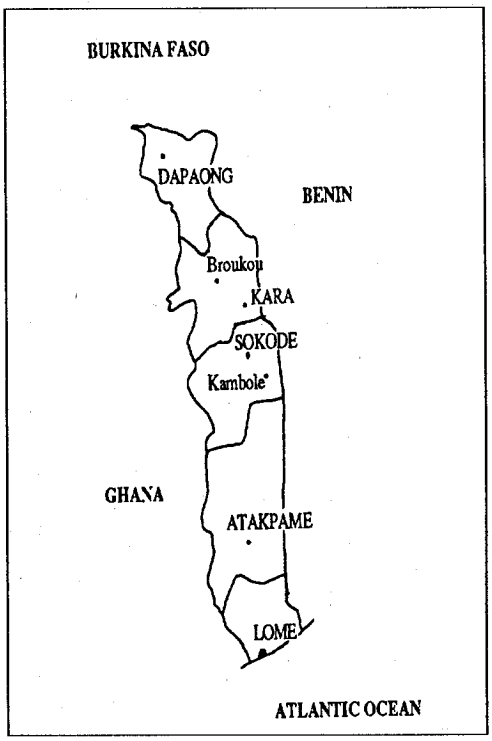

Figure 1. Map of Togo

The absolute numbers of oxen pairs that PROPTA estimates are in use today are given in Table 1. These figures are based on the number of pairs associated with the 32 projects

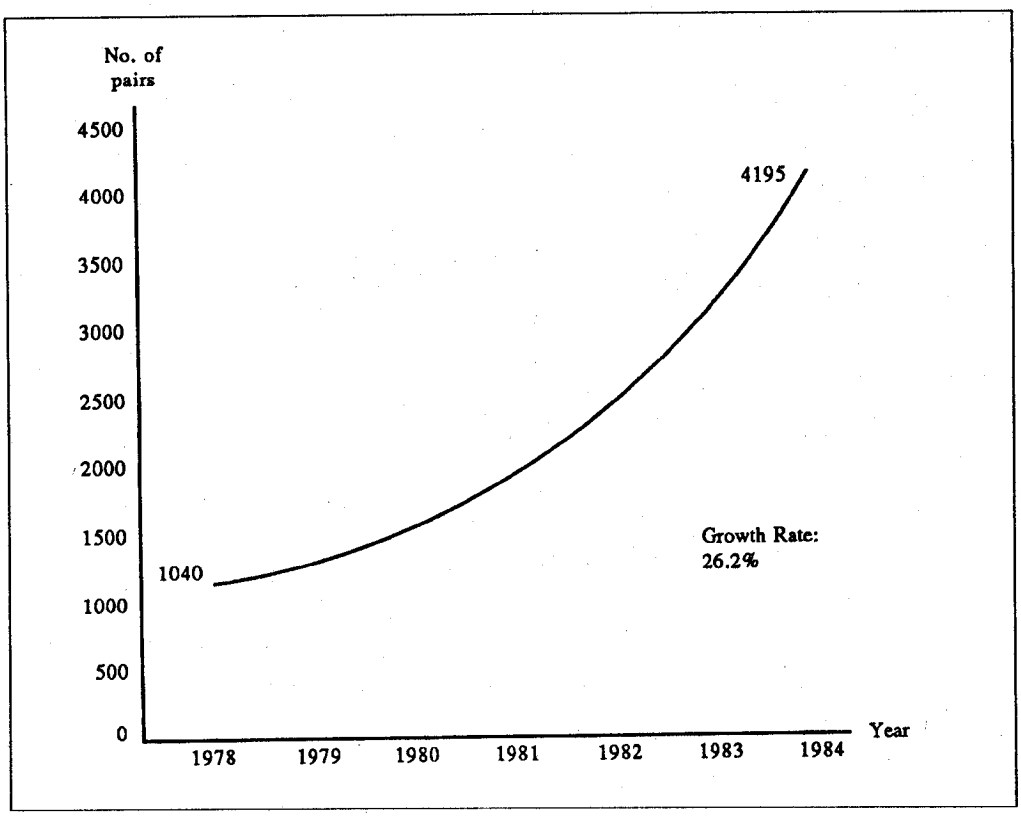

Figure 2. Animal traction adoption

promoting animal traction in 1985. There are, among PROPTA's colleagues, those that propose that the actual number of pairs is significantly greater than has been indicated. Through the continuing reporting procedures initiated this year by PROPTA, more precise figures will soon be available. At this early stage, it is probably safest to say that 4,195 is the minimum number of oxen pairs to be found in Togo.

Table 1. Numbers of pairs of draft animals in Togo in 1985

Region	No. of pairs	%
Savanes	3214	76.6
Kara	637	15.2
Central	257	6.1
Plateaux	55	1.3
Maritime	32	0.8
TOTAL	**4195**	**100.0**

Source: PROPTA, 1985

Absolute numbers of oxen pairs only tell part of the story. Helped by an earlier estimate of the number of oxen pairs in Togo in 1978, PROPTA has a general idea of the rate of growth in the number of oxen pairs. With the two available estimates seven years apart, an average annual growth in farmer-owned oxen pairs of about 26% per year emerges (see Figure 2). What is more, by employing known estimates of the total farmer households and extrapolating them to the present using commonly accepted population growth rates, it is possible to make an estimate of farmer adoption rates by economic region (see Table 2). Significantly, farmers in the Savanes Region

Table 2. Estimated regional adoption rates for animal traction

Region	Adoption Rate
Savanes	9.2 %
Kara/Central	0.9 %
Plateaux	0.05 %
Maritime	0.05 %

Sources: PROPTA, 1985 and USAID, 1980

have achieved a rate of adoption nearing 10%. In the combined Kara and Central Regions, however, the estimated animal-traction adoption rate hovers at 1%, while the farmers in the Plateaux and Maritime Regions have shown little sustained interest in the technology.

A discussion of the reasons for farmer interest in animal traction in the Savanes Region merits a study all of its own. For the purpose of this paper, however, it can briefly be stated that animal traction development in northern Togo has benefited from the following conditions:

- The soils of the Savanes Region are generally light and the fields flat and open. These are conditions which are favourable to the smaller, less expensive animals generally available in Togo.
- The vegetation in the Savanes is dispersed, making it relatively easy to clear fields of stumps, bushes and rocks; this characteristic greatly facilitates the initial transition to animal traction.
- Farmers in the region have themselves been cattle owners for a long time. This familiarity with cattle facilitates their care and use for animal traction purposes. Furthermore, the region draws on supplies of animals in Burkina Faso and Niger. The number of animals in the herds available to Savanes farmers is therefore far greater than regions further south; hence animal prices are lower in the north.
- The cropping patterns and food preferences of northern Togo emphasize field crops which are likely to benefit from cultivation using animal traction (millet, sorghum, maize, beans, groundnuts). By contrast, cropping patterns and food preferences in southern Togo emphasize root crops which benefit much less from animal traction technologies. Furthermore, long farmer association with cash crops, such as cotton and groundnuts, plays an important role in helping pay for the higher capital input costs associated with a switch to animal traction.

Farmer management in the transition zones

Definitions and areas of study

The Kara and Central Regions are areas where the adoption of animal traction is at the takeoff point. As farming systems are in the early stages of the transition from hoe to animal traction farming, discussions among farmers in these two regions about the two technologies are of particular interest. The following overview is drawn from interviews with farmers in Broukou (Kara Region) and Kambole (Central Region) earlier this year.

Farm capital during transition

In general, hoe farmers and animal traction farmers operate in the same socio-economic environment under identical conditions of resource availability and rules of land proprietorship. Labour is supplied by the farmers and their families. However farm capital is not the same, nor the farm equipment that extends the farmers' productive capacity. For manual farmers, the basic farm capital consists of a number of small weeding hoes, one for each worker, and large mounding hoes used only by men in conjunction with a machete. Animal traction farmers employ this same equipment except the number of hoes is reduced.

However, the adoption of animal traction also requires the acquisition of a pair of animals and traction equipment; the most common of

these are a plow, a ridger, a triangular weeder, a harrow, a cart and various accessories. Furthermore, the animal traction farmer may construct a stable for his oxen, a warehouse to store equipment, additional granaries, storage for hay and a manure pit. Clearly the animal traction farmer is faced with a significant investment in farm capital over and above what he would have made if he remained a hoe farmer.

The cost associated with this list of animal traction investments varies from farmer to farmer. The animals themselves, for example, are often inherited from parents. The parents may have initially acquired them through gifts, trading or as investment purchases following profits, the wealth being transformed into herds in a form of traditional savings designed to assure family security, financial health and social prestige. Cattle ownership can often save as much as a third of the price of the full animal traction package. It also gives rise to the notion, even in animal traction circles, that the rich get richer. Be that as it may, the farmer adopting animal traction is faced with a sizeable, supplemental farm-capital investment of between 50,000 and 350,000 CFA (US$ 150-1050). These are high figures for a farmer in a countrywhere the average annual per-capita income in the agricultural sector is around 38,200 CFA. Needless to say, capital investment in the construction of outbuildings remains small.

Table 3. Time comparisons for operations

Operation	No. of work days per hectare	
	Oxen and 2 workers	2 hoe farmers
Field cleaning	2	-
Light plowing	1.5	-
Plowing	2-4	-
Ridge plowing	1	7-10
Harrowing	1-1.5	-
Weeding	1-2	4-6
Ridging	1-1.5	6-8

Source: Amegbeto, 1986

The consequence to the farmer of this initial investment is a very significant increase in fixed costs, most often involving the repayment of the cost of credit for farm machinery and animal purchases. This often represents the farmer's first initiation into the world of institutional credit and planning credit-repayments that is now so indispensable to the development of modern agriculture. This is an impact of animal traction adoption of the first order. The risks to the farmer of this indebtedness are considerable, especially since farmers are not well trained in financial management and are limited in their ability to commercialize grain.

Technical implications for production

The speed at which field operations are executed using animal traction has had an important influence on Togolese farmers. They no longer question its superiority over hoe farming in terms of speed of field work. It has simply become one of the realities of Togolese agriculture. Most farmers in the areas studied, whether they use hoe or animal traction, work practically the same number of days each week for about the same length of time, 10 to 12 hours/day. However, the time spent on actual farming operations differs significantly: 5-6 hours/day for animal traction farmers against 7-9 hours/day for hoe farmers. The impact of this time-saving aspect of animal traction technology is an increase in field size and a diversification of on-farm activities. In Table 3 comparative data is presented on the time spent on each farm operation.

Putting more land under cultivation

In the two zones studied, animal traction farmers clearly work more cropland than hoe-labour farmers. The average farm size for animal traction farmers was 5.4 ha, while for manual farmers it was 4.3 ha. Moreover, while PROPTA's statistics in this area are still limited, data from other parts of the country indicates a willingness of animal traction farmers to put

Table 4. Cultivated areas of a sample of 28 farmers in the Savanes Region

Area cultivated with animal traction (ha)	No. of farmers
3.5	2
3.5-4.5	4
4.5-5.5	5
5.5-6.5	7
6.5-7.5	6
7.5	4

Source: Allingham, 1984

Table 5. Cultivated areas of animal traction adopters in the Kara and Central Regions (average figures)

Year	Kara sample ha/pair	Central sample ha/pair
1981-82	2.0	2.0
1982-83	2.8	2.8
1983-84	2.5	2.5
1984-85	3.3	3.3

Sources: Kara sample: PVAS, 1983; Central sample: Zeidler, 1985.

Table 6. Hire rates for animal traction services

Operation	Price (CFA/ha)
Field cleaning	6000
Light plowing	5000
Plowing	9000-13000
Ridging	5000
Harrowing	1500-2000
Weeding	8000-10000
Mounding	6000-8000

Note:
Prices for transport services are negotiated according to the nature of the load and the distance, and are consequently very variable.

Source: Amegbeto, 1986

more land under cultivation than was previously possible with the hoe.

While the national average farm size is around 1.75 ha (IBRD, 1984), animal traction farmers surpass this average by a considerable margin. In 1983, a sample of 28 animal traction farmers in the Savanes Region found only two who were still farming less than 3.5 ha. (Table 4).

Similar results are found among animal-traction adopters in other regions of the country. Data from both the Kara Region and the Central Region (Table 5) indicates *progressive* expansion year by year of total areas farmed using oxen by recent adopters.

Increased diversification

With time saved in executing field operations, the animal traction farmers diversify. However the possibilities are limited. Small-scale production possibilities (shea trees, néré, kapok, etc.) and local commerce exist, but are not yet a significant option, particularly since in these areas the traditional social division of labour is still strong. Likewise, the rural labour market is not sufficiently advanced to afford the animal traction farmer the opportunity of making money as a day labourer.

When the animal traction farmers diversify, they try to do it within the agricultural sector, but selectively so as to minimize the risk of dislocating their family work force. Consequently there is evidence of a shift toward livestock, but not as yet to a level where one could claim the emergence of a true livestock-agriculture association. Ways to encourage this tendency are a key topic for our discussions here at this networkshop.

Several other possibilities for diversification present themselves to the animal traction farmer. These include work on other farmers' fields and transport. Third-party animal traction services are an enterprise area now experiencing important growth in Togo's rural sector. This takeoff is due to the fact that the majority of the hoe farmers now recognize the inefficacy inherent in much of their hoe-farming technology and are no longer content with the low yields associated with it. This opening up of hoe farmers to animal traction is reflected in the development of a rental market for ani-

mal traction services, current prices for which are indicated in Table 6.

Limits to the animal traction service market

The development of this animal traction service market depends entirely on the means at the disposal of the hoe farmers who request these services. The constraints on hoe farmers will eventually limit the growth of the animal traction service market in the rural sector. In order to rent animal traction services for field operations, hoe farmers must have already acquired substantial resources necessary to prepare their fields for animal traction. Destumping, root pulling and initial plowing are necessary before the oxen can be used effectively on their fields. This investment in field preparation, in addition to the resources required to pay for the rented animal traction services, is an outlay beyond the means of many hoe farmers. Furthermore hoe farmers who rent animal traction services tend to acquire their own animals as quickly as possible. Consequently the rental market for animal traction services is liable to be unstable and limited in size as farmer customers become draft animal owners in their own right, and eventually competitors for the rental business of the remaining hoe farmers.

Other farm practices

Animal traction farmers in the transition zones studied have developed a farming system in which two distinct types of fields are prepared. There are fields which are completely traditional in character and developed using only human power and tools. There are also fields where both manual and animal traction tools are used; these are semi-modern fields where modern agricultural practices are commonly employed. Though each of these fields aims at increasing production, the result of their coexistence is an underutilization not only of the farmers' animal traction equipment but also of their manual farming equipment.

As contrasted to manual farmers, who tend to remain survival-craft farmers, animal traction farmers have a commercial interest in their adopted technology. Upon adopting animal traction, farmers modify their production practices. They are more likely to respect the agricultural calendar. They are more open to modern agricultural methods such as seeding in line in prepared fields and using improved seed, chemical fertilizer and synthetic products. They are more attentive to the fertility of their soil and the importance of increasing yields. Given the pressure they are under to maintain their financial and alimentary solvency, animal traction farmers give priority to cash crops (cotton, maize, groundnuts and beans) for which the market is more or less stable; in fact, in Togo it is often guaranteed by a marketing organization.

Furthermore, there is the animal health service associated with animal traction. Even where it is not well understood or even ignored, it plays a role in developing an association between cattle raising and agriculture. This, in turn, positively influences the care of other domestic animals.

Profitability of animal traction

The profitability of animal traction turns on the efficiency of farm management. Strong farm managers are more likely to make animal traction work than are weak farm managers. That the adoption of animal traction can increase production and net revenue for some farmers is not in doubt. This is illustrated by the financial data from typical successful animal traction farmers presented in Table 7. These farmers farm in the Broukou and Kambole zones and the CFA figures represent positive net revenue from each of their operations: agriculture, livestock and other. The total net revenue of these farmers contrasts with the average agricultural sector per-capita income of 38,200 CFA/year.

Table 7. Selected net revenues from mixed farming systems

Case	Agriculture (CFA)	Livestock (CFA)	Other (CFA)	Total (CFA)
1	243 456	8350	16 000	267 806
2	651 580	16 000	29 500	697 080
3	315 504	8 820	39 000	363 324
4	452 492	24 200	26 400	503 092
5	441 095	2 150	13 000	456 245
6	516 834	53 845	2 500	573 179
7	336 095	64 750	---	400 845
8	844 553	---	79 000	923 553
9	476 974	5 500	66 000	548 474
10	622 073	83 000	164 000	869 873

Source: Amegbeto, 1986

Reinvestment

In the village, it is remarkable to observe the difference between animal traction farmer households and hoe-farmer households. Animal traction farmers are able to support their food needs and tend toward a progressive improvement in their quality of life. In contrast to hoe farmers, animal traction households enjoy a visibly higher level of consumption based on increased farm revenues; this was particularly true of the consumption level of the head of the household.

However on the majority of the farms visited, farmer objectives seemed to have been rather quickly attained. Few of them reinvested directly in their agriculture, either to increase their productive capacity or to augment their revenues. Even while recognizing the benefits of animal traction, these farmers directed their revenues toward improving their house and toward the purchase of consumer goods which do not have a direct and progressive effect on their principal agricultural activity, but rather reinforce the social position of the head of the household.

As a consequence, many animal traction farmers are living from one agricultural season to the next. When it comes time to sell an old pair of animals and purchase a new pair, the financial situation of these farmers is much the same as before. These farmers, like any new animal traction farmer, are left without the money to finance the new team. Such financial management practices do not favour the long-term development of animal traction; like several others discussed in this paper, this situation points out the need for a systematic farmer-oriented farm-management training programme.

Limits to the spread of animal traction technology

For most Togolese animal traction farmers, the full potential of the technology has not yet been realized for natural, technical and financial reasons. For example, the rainfall period is often so short in some sectors that it is not possible to fully exploit the animal traction technology. Complete soil preparation is often less a concern than getting the seed in the ground. The adverse climate limits the size of the farm and what resources farmers are willing to expend on it.

The local work force is often inadequate and limiting, and this is a crucial factor for Togolese farmers. Most farmers rely essentially on family labour, a resource which is typically spread thinly over the many agricultural and non-agricultural activities of the farm. The significant additional labour requirement which often follows the adoption of animal traction necessitates the use of temporary wage labourers. This is a financial burden in addition to those already cited.

In addition, the expansion of farmers' cultivated areas often requires the sizeable investment in field preparation, notably the destumping and cleaning of their fields with perhaps the opening work carried out by a tractor. These costs weigh heavily against the financial stability of the animal traction enterprise and exert a strongly negative pressure on the potential adopters.

The durability of hoe farming

It is evident that, even given the superiority of animal traction technology, the hand hoe will not be replaced easily. Consider the following three examples:

- Many farmer families in Togo enjoy foods made from root crops. *Fufu* is a popular example of such food preferences which are common in the Kara Region and in the south. Such tastes are an important reason for the durability of hoe farming in Togo, for cassava and yams are grown in mounds or holes, and these are more easily fashioned with hoes than with animal traction.
- Some operations, such as destumping, root removal, seeding, fertilizer spreading, plant treatments and harvesting, are not well suited to animal power systems and, even if they were, would require additional equipment, training and financial resources not currently available to many farmers.
- Animal traction operations do not always produce regular and homogeneous results. Consequently, manual follow-up work, with a hoe, is often required even of experienced animal traction farmers.

Impact on the village

The effects of animal traction at the village level, in those areas where the technology is developing well, are generally seen in the market place. Broukou, in the Kara Region, is a good example. The effect of the increased farmer production, produce sales and consumption has resulted in the transformation of this village into a market centre, a point of attraction for numerous consumers and merchants who trade in local and imported products. Villages like Broukou tend to achieve a fuller economic autonomy and an increased importance within their zone. This increased dynamism at the village level, as witnessed at Broukou and Kambole, influences younger Togolese to reconsider farming as a career.

Conclusion

This paper has tried to capture through observation, description and statistics the hope and the energy which an increasing number of Togolese farmers associate with animal traction technology. Quite simply, it is a technology which opens up new opportunities never before *realistically* available in the rural agricultural sector. Sadly the technology is not available to everyone and there are failures as well as successes to relate. For us at PROPTA, the failures increasingly indicate the urgency with which training in farming systems and farm-management technologies must follow the adoption of animal traction.

In closing, you are encouraged to visit Togo and PROPTA. Togo is a country where animal traction is a priority, where animal traction is, even within different regions, at different stages of development, and where there is great diversity in farming systems. When you visit Togo, you will find a uniquely dynamic animal traction development effort.

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