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RECOMMENDATIONS TO NATIONAL GOVERNMENTS AND INTERNATIONAL  
AGENCIES FOR THE DESIGN AND IMPLEMENTATION  
OF ANIMAL TRACTION PROGRAMS\*

by

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## TABLE OF CONTENTS

|   | <u>Page</u> |
|---|-------------|
| INTRODUCTION . . . . .                    | 1           |
| OBJECTIVES . . . . .                      | 2           |
| AGRICULTURAL PRICING POLICIES . . . . .   | 2           |
| EQUIPMENT MANUFACTURING NETWORK . . . . . | 5           |
| WORK ANIMAL SUPPLY . . . . .              | 7           |
| FINANCIAL LIQUIDITY . . . . .             | 9           |
| MEDIUM TERM ANTRAC CREDIT . . . . .       | 10          |
| RESEARCH AND EVALUATION . . . . .         | 11          |
| CONCLUSION . . . . .                      | 12          |

## INTRODUCTION

Since 1960, over one hundred rural development projects which emphasize draft animal technology have been financed in francophone West Africa. National governments and international donors continue to maintain a funding priority on animal traction (ANTRAC) projects. The recent Sahelian drought and the rise in petroleum product prices further reinforce arguments for this technology.

In addition, this agricultural technology minimizes foreign exchange requirements. The scale of the technology is appropriate to the level of land use and availability and to the farm level organization of agricultural production. It represents a potential method for progressive improvement of soil quality based on a level of investment feasible to most producers. Furthermore, as a joint product enterprise in both meat and crop production, it encourages a more rational use of animal resources. With the rapid growth in the regional demand for red meat, this aspect of draft animals has become increasingly important.

Once national governments and international donors establish a policy of promoting the use of ANTRAC technology, their primary role is to design the projects, determine the nature and level of financing and provide national level structures which can be called upon by the provincial agencies designated to implement the projects. The expectation should be to design a program which will become self-sustaining as soon as possible.

This paper is intended to accompany two other documents which deal with guidelines for provincial planning and for village extension agents. On each level, the audiences will not have the same concerns or roles to play in the design and implementation of ANTRAC programs. Nevertheless, the areas of joint concern are dealt with explicitly.

### OBJECTIVES

This paper highlights issues in the design and implementation of ANTRAC programs which are of primary concern to national governments and international donors. It also recommends certain guidelines both for levels of funding and for the organization of national institutions which serve the technological package. The areas of concern for national governments and international donors are: a) agricultural pricing policies, b) the supply of equipment and work animals, c) agricultural credit and financial liquidity and d) research and evaluation. Obviously governments and donors will be concerned with decisions at all levels of program design and implementation, but this text will deal with issues that cannot be resolved at the local or provincial level.

### AGRICULTURAL PRICING POLICIES

Agricultural pricing policies are very likely the most sensitive and difficult areas of policy for national governments, whether it is linked directly to ANTRAC technology or to any other aspect of agricultural inputs and outputs. In the design of a technological package based on the use of animal traction, constant reference must be made to

the relationship between the cost of production inputs and the farm-gate price of outputs. Therefore, economic analysis of the farm enterprise using ANTRAC technology is necessary to design a program. However, if decisions are made to alter the input-output price relationships, policy makers should incorporate the price distortions into a financial analysis of the farm enterprise. If it is determined that the output price for a particular crop needs to be kept artificially low, then it may be necessary to provide some subsidy support for the cost of production inputs. In Togo, for example, the agricultural research community proposes as much as 300 kg. of chemical fertilizers for cereal crops. At an official farm-gate price of 50 CFA per kg. for cereals, it would be extremely difficult to justify an average real price (CIF Lomé) of 150 CFA per kg. for fertilizer. Consequently, the government supplies those fertilizers at the subsidized price of 15 CFA per kg. Moreover, a set of ANTRAC equipment is supplied at a subsidized price of 4,000 CFA whereas the real cost is in the neighborhood of 30,000 CFA. Similar examples of this can be cited throughout the francophone West African region.

Such pricing policies have also been justified on the basis of providing incentives to producers to use a given technology. On the one hand, it is important to establish that the source for maintaining those subsidies is reliable. For example, the fall in world phosphate prices caused serious difficulties to Togo's pricing policy for subsidized tractor hire services, particularly in combination with the rise in petroleum prices, since the subsidies were paid with phosphate revenues. On the other hand, if plows are given an 85 percent subsidy,

the bill to the government for the first 100 plows is only 2,000,000 CFA. However, plows for the 30,000 farms in the Kara region alone in Togo would imply a bill of 600,000,000 CFA--a much more serious burden on the national budget. Under one set of prices, the farmer will make his management decisions. If the prices should seriously change, that allocation of resources may no longer be in the farmer's interest.

Clearly, agricultural input-output pricing can influence on-farm management decisions and in particular the acquisition and use of ANTRAC technology. An additional illustration is useful. In Niger, the proposition to use a pair of oxen and equipment at unsubsidized prices in a region (Niamey department) where the basic cropping system is millet and cowpeas was patently untenable and a major reconceptualization of ANTRAC technology (donkeys and minimum tillage equipment) was necessary. At unsubsidized prices, which was the government's intention, the level of debt necessary for an oxen ANTRAC unit could not be paid off even using very optimistic levels of millet and cowpea production at their official farm-gate prices.

One concrete technique of pricing policy for ANTRAC is to allow all steel for agricultural uses, whether in the form of ready-made equipment or as raw material for in-country manufacturing, to be imported tax-free. As the foundation of economies in the area, agriculture can be reasonably exempted from such taxation, particularly since the tax would simply be passed on to the agricultural producer.

The competition between consumers and producers for preferential price relationships, however, is an obvious dilemma for policy makers. This is compounded in francophone West Africa by a general parallel

competition between rural and urban populations. In such an environment, it would only weaken agricultural programming to ignore the policies of price relationships. In situations where there are significant distortions in either input or output pricing as a matter of policy, a useful design exercise is to test farm budgets with a range of pricing policies as well as the basic assessment using economic pricing.

#### EQUIPMENT MANUFACTURING NETWORK

When a basic line of equipment has been chosen, it is then necessary to provide for its supply. Since a number of regions within any of the francophone West African countries will have ANTRAC projects, there are several advantages to organizing an equipment network on a national scale. In the early stages of an ANTRAC program, it may not be reasonable to create an in-country manufacturing capacity given the small numbers of buyers involved. At some point, however, it will become desirable. The first advantage is obviously in foreign exchange savings. This is particularly the case when one centralized manufacturing installation with larger scale and more efficient machines can be used to make the equipment. If this is the case, major savings can be derived from the volume purchasing of raw materials. In 1974 in Upper Volta, for example, the per ton price of a 100 ton order for steel was 30 percent cheaper than ordering just a single ton.

A further advantage to a nationally organized manufacturing network is that it facilitates standardization and quality control. The importance of standardized specifications lies in the interchangeability of parts and the ability of trained artisans to work properly on all

equipment throughout the country. In one region of Upper Volta, the existence of over a dozen brands of plows not only made training in the use of plows much more difficult but also made the supply of repair work and spare parts impossible on a consistent basis.

The first level of quality control is in the specifications for the raw materials. The durability of a plow is highly correlated with the grade of steel used in making it. Centralized purchasing of raw materials and the import tax break make it feasible to insure that all farmers are getting the same quality steel.

The manufacturing network should be stratified according to the economics of each level of operation and to the needs of the clients. The production of the basic equipment is economically advantageous in a large scale centralized installation, but farmers need a plow point repaired quickly at the local level. Spare parts and repair services need to be readily available to the farmer. Hence, such services can be best supplied by trained rural artisans. To facilitate the distribution of equipment and raw materials and to insure quality control, depots, manned with a mobile unit, should be established at the provincial level. While insuring the regular supply of equipment and materials, the mobile unit can also monitor the rural artisans and insure that equipment specifications and quality are being maintained.

A rational and economic organization of the manufacturing network is essential to the support of ANTRAC technology. Farmers need a reliable source of equipment in order to plan their operations and effectively make use of ANTRAC.

## WORK ANIMAL SUPPLY

Throughout francophone West Africa, a major obstacle to the continued expansion of ANTRAC has been the lack of available work animals.\* This is largely related to the nature of the livestock sector itself regardless of whether the animals are needed just for work or for work and meat. By definition, investments in livestock raising entail a significant delay in economic pay-offs which most owners cannot afford. For cattle, it will require four years (one year gestation, three years growth) before the owner can benefit from ANTRAC and eight to nine years before he benefits from beef production. Consequently, very seldom does the livestock sector benefit from systematic investments in the national herd, partly because governments cannot tie up national funds for that long and donors prefer quicker, more visible returns to their investments. Unfortunately, the biological fact that it takes four years to get a work animal cannot be changed.

This picture has been further complicated by the recent surge in the demand for red meat, particularly along the West African coast. Although all governments have restrictions on the slaughter age of animals, there has been a consistent drop in the age of slaughter, and the animals slaughtered are predominantly males. High calf mortality rates, the lack of investment in the national herds, and competition from the growing market for meat all contribute to a progressive tightening in the supply of work animals. In less than ten years, cattle prices have doubled in

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\*This discussion is primarily directed at ANTRAC programs which use cattle as work animals. While programs using donkeys and horses must deal with many of the same issues, the main difference is the absence of a meat production aspect to the use of donkeys or horses.

northern Benin. Currently in northern Togo, cattle prices are increasing about 10,000 CFA per year. In Niger ten years ago, a donkey was simply roped when needed as a pack animal and left to wander when not. Today prices are approaching 20,000 CFA per head.

If ANTRAC is to become a widespread agricultural technology, systematic interventions for the welfare of the national herd must begin early in the program, particularly given the inherent lags in results. The first level of activity is basic veterinary care. As has been referred to in the accompanying guides, the essential problem is the supply of medicines and basic equipment. Decisions concerning the supply of veterinary medicines and equipment are national level concerns. As the veterinary director in Benin noted during the pasteurilosis epidemic, for the price of two animals he could have saved hundreds.

Calf mortality rates of 40 percent in the first year are common throughout francophone West Africa. Elaborate schemes in livestock production techniques are unnecessary to have a significant impact on this loss of supply. If the veterinary service could insure the availability of deparasiting medicines, this mortality rate would be drastically reduced.

The more difficult aspect of improved supply of work animals is the supply of adequate feed. At one level, the arguments for incorporating forage crops in rotation systems are even further strengthened. At another level, the national installations for the transportation of agricultural products should pay explicit attention to the potential feed value of crop by-products and to a distribution system making these supplements available to livestock owners. In West Africa, the most common by-products are obviously cotton seed and groundnut cake. It is

interesting to note that in Mali, pressure on feed supply is resulting in the increased use of on-farm silage, use of grain and bean crops as feed, growing of forage and intense competition for crop by-products. Such activities should be encouraged and facilitated by policy makers to insure a stable and adequate feed supply and hence supply of work animals.

A further incentive to national governments for promoting ANTRAC is that by providing benefits to farmers through work, cattle will not enter the meat markets too young and at less than full adult weight. The delay in slaughtering will constitute more efficient use of animal resources and will increase the total amount of meat supplied for the same number of animals slaughtered.

#### FINANCIAL LIQUIDITY

Another major obstacle to the smooth implementation of ANTRAC programs has been that often project funding has not provided adequate liquidity such that project inputs can be supplied on time and in adequate numbers. In a five-year credit system, only one-fifth of outstanding loans come in annually, and only after harvest. Raw materials have to be ordered at least a year in advance, e.g., well before the previous year's harvest. Consequently, the manufacturing installation has strong cash requirements with major portions of its capital tied up in outstanding loans. This is aggravated by an expanding program versus a more stable level of demand. Donors and governments must insure that the revolving credit funds are adequate to avoid this potential liquidity squeeze built into the credit system.

Because there is such a lag in distributing veterinary medicines, administering them, collecting their cost and reassembling the cash, an adequate revolving fund for veterinary supplies is also critical. As veterinary suppliers will not deliver on credit, the national veterinary service should have three times its annual needs in this fund--one being ordered, one being administered and one in hand. Although these liquidity questions seem obvious or almost trivial, they can be major problems in project implementation and are far too often overlooked by both donors and governments in project design.

#### MEDIUM TERM ANTRAC CREDIT

Agricultural credit for ANTRAC will be determined either at the project level or the national level. Often the project will borrow from the national bank to supply medium term ANTRAC credit to farmers. Whether grant financed by donors or loan financed through national development banks, the basic terms of credit for ANTRAC will be established at the national level.

In the same context that the agency responsible for administering medium term credit to ANTRAC farmers must consider reasonable expectations for farmer income streams in the design of the credit system, the organization supplying the capital for the credit fund should also reflect the conditions under which that capital will be used. If the funds are to be used in a five-year credit program, the supply of capital to that credit fund should reflect the fact that only 20 percent of the outstanding loans will be received in any given year. If the program is expanding, the pressure on the fund's liquidity will progressively increase.

The terms under which capital is made available to a project for ANTRAC credit can impose constraints on the way in which that credit system for farmers is designed. If the credit fund is loan financed through the national bank, the decision to use concessionary interest rates to farmers will have to be reflected in the interest rates charged to the project. If credit is made available to farmers at 8 percent, it would be untenable to charge the project 10 percent, much less a real interest rate which might approach 20 percent.

In designing the supply of capital to an ANTRAC program, the terms for that fund should reflect the nature of the agricultural production system which is intended to repay those funds. In the discussion of financial liquidity, the reasonable time lags which are inherent to the system were discussed. The terms of the credit fund will have to accommodate those lags if the program is to become self-sustaining.

#### RESEARCH AND EVALUATION

Given the large number of ANTRAC projects in any one country, research on ANTRAC, the monitoring of projects and their evaluation can be most effectively coordinated by a national organization, such as the Ministry of Rural Development. While the basic responsibility for project execution will be the provincial agencies, evaluation and comparing project performance is the proper function of a national monitoring organization.

The national evaluation service can also provide guidelines to the research community on the design of relevant research. In many areas of Niger, given the current economic and agronomic parameters, the use of oxen is not feasible. However, the organization of research and design on ANTRAC continues to emphasize the use of oxen and deep plowing techniques.

At the national level, more emphasis should be given to research on the use of cheaper minimum tillage techniques.

In coordinating research and evaluation activities, the national service should standardize the reporting techniques. This can be as simple as requiring each region to complete the same standardized reporting questionnaire. Further coordination can be applied by structuring the monitoring service for each project in terms of comparative evaluation among projects. For instance, the survey techniques used to monitor yield and area effects in each project should be identical.

This will permit a legitimate comparison of performance across projects. In order to learn from experience and improve the design of ANTRAC activities, the most important role for the national monitoring service will be to standardize the monitoring systems for each project. In order to ask the same question of a number of projects, the methodology will have to be compatible if the answers are to be applicable outside one particular experience.

## CONCLUSION

This text, in conjunction with the two accompanying guides, has discussed those areas of concern in the design and implementation of ANTRAC which governments and donors will have to consider. Though the precise details of an ANTRAC system will be worked out at the project level, the environment within which those details are defined is established by the national government and the donor. Pricing policies, the supply of animals and equipment and the financial liquidity of the operation are essentially determined at the national level. To overlook these

issues or establish policy on a project-by-project basis will introduce, at best, confusion into the system and render the emergence of a self-sustaining agricultural technology less likely. The adoption of ANTRAC technology will permeate the entire agricultural system; and in the same context that farmers are not simply replacing the hand hoe with a plow, national structures in support of agriculture must be redesigned in light of that new technology.