



Animal Power in Sierra Leone and Liberia





Animal traction development strategies in Sierra Leone

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Abstract

Farmers started working with work oxen in Sierra Leone in 1929. Limited animal traction extension schemes were developed from 1930-1956. Small numbers of farmers continued to use oxen for plowing for many years without government inputs. This encouraging persistence is attributed to the services of village blacksmiths and traditional animal health practices.

Constraints to the development of work oxen in Sierra Leone include the uneven ownership and distribution of cattle, disease, the presence of stumps in most cultivated land, low farm incomes relative to the cost of animals and implements and the general economic situation. Agricultural labour is limited and cannot easily absorb the labour shifts related to ox plowing.

Renewed interest in draft animals led the Ministry of Agriculture, Natural Resources and Forestry (MANR&F) to set up the Sierra Leone Work Oxen Project in cooperation with the Njala University College. For the past six years the Project has received support of British and French sources. It now comprises a Coordinator, seven field officers (assisted by six expatriates) and sixty intermediate and junior staff. It is shortly to be incorporated as a permanent programme of the Ministry.

The Work Oxen Project is working to develop animal traction through research, training, publicity, equipment testing and implement production. About 500 plows have been fabricated at the Rolako Oxen Centre. Most have been of the Pecotool type which provides efficient soil inversion and can act as a multipurpose toolbar. The project has been carrying out on-station and on-farm research on animal traction. Socio-economic studies in the Mabile Valley indicate there

are 150 pairs of oxen, which work about 40 days each year, mainly for plowing. 70% of their time is for rice production, and 28% for millet and groundnuts. Data suggests oxen lead to a reduction in labour input per unit area and an increase in the area cropped.

The Project has assisted the establishment of farmers' associations for using work oxen. One of the schemes experienced relatively high mortality, which was attributed to poor husbandry, limited supervision, inadequate health services, limited grazing hours, and the fact that farmers gave priority to other enterprises. In the more successful schemes farmers have started buying oxen for themselves and village ox carts are increasing, but no farmer has started to use oxen for planting or weeding.

The project has assisted the Integrated Agricultural Development Projects (IADPs) and other organizations to develop their own work oxen programmes. One of the more successful has been Koinadugu IADP where numbers of oxen have increased from 74 to 250 pairs. They are used mainly for plowing, working only 34 days per year. Success is attributed to a study of the farming systems and a pace slow enough to allow careful selection of loan farmers and full extension back-up. Other programmes include Magbosi and North Western IADPs, Tikonko Agricultural Extension Centre and the Swamp Rice Project. As a result of the various schemes, numbers of work oxen in Sierra Leone have increased from 30 pairs in 1980 to 500 pairs in 1985.

Background

Farmers started working with work oxen in Sierra Leone in 1929. This was due to the abolition of the domestic slave practice which

created an acute agricultural labour shortage. The then colonial government decided to send trainees to neighbouring Guinea for them to be trained in animal power techniques. These trainees then returned and were distributed to the various stations of the agricultural department to train farmers and to develop animal traction. Limited animal traction extension schemes were developed from 1930-1956. The use of work oxen in rice cultivation was found to be successful, but the potential for animal traction was never properly developed due to emphasis on tractor hire schemes, unavailability of ox-implements, poor animal health services, and other constraints. However ox traction programmes have continued with very little government input. The persistence of animal traction was possible due to the services of village blacksmiths, who maintained and repaired plows, and to the farmers' use of traditional animal health practices to cure the oxen.

Renewed interest in the potential of draft animals led the Ministry of Agriculture and Natural Resources to set up a national programme to investigate and develop the use of work oxen in the country (Starkey, 1981). For the past six years, the Sierra Leone Work Oxen Project in cooperation with the Njala University College and with the support of British and French Technical Assistance has been carrying out research on the potential for using draft animals in Sierra Leone. In cooperation with the Integrated Agricultural Development Projects (IADPs) and non-governmental organizations (NGOs) it has initiated and coordinated the development of pilot extension programmes. The results of the on-station and on-farm research and socio-economic studies, together with the success of pilot extension programmes and the persistence of the use of draft animals for over 30 years in the Bombali and Koinadugu Districts, have led to the conclusion that animal traction has a distinct role to play in the agriculture of Sierra Leone. In particular oxen can be used for plowing in various soil types and ecological conditions. They

can also be used for weeding, for ridging and for transport, and work oxen are a valuable means of encouraging integrated farming and good animal husbandry among crop farmers (Starkey and Kanu, 1985).

Animal traction potential in Sierra Leone

Through on-station and on-farm trials at Njala and Mabole Valley, it has been shown that work oxen can be successfully used in upland soils for the cultivation of rice, groundnuts, millet and cowpeas. They can also be effectively used for growing rice in swamps and in bolidands (bolidands or bolis are flat grasslands with poor soils that flood for one to four weeks every year). Work oxen can be used for primary cultivation (plowing) and for harrowing, seeding, weeding and groundnut lifting. They can also be used for the plowing, puddling and levelling of rice swamps and for making ridges for tuber crop production. In addition, work oxen can give the Sierra Leonean farmer the opportunity to earn non-agricultural income through transport and hiring out. Finally, given an appropriate animal-powered gear system, oxen may be able to perform other important activities such as water pumping, threshing, cassava grating and milling.

About 333,000 N'Dama cattle are found in Sierra Leone. In addition about 34,000 cattle a year are brought across the frontiers into Sierra Leone to the cattle markets. The N'Dama is the most appropriate breed for the Sierra Leone conditions, particularly as it has trypanotolerant characteristics. N'Dama cattle can be utilized for draft purposes with little or no adverse effects on the local meat industry.

Work oxen afford the opportunity to integrate livestock and crop farming, allowing the farmer to appreciate the reciprocal advantages of both, for example the use of crop residues for animal feed and the use of dung to manure the crops. The integration of crops and livestock implies the management of grazing areas

at village level. In view of the often hostile relationship between livestock and crop farmers, such integration could help to facilitate agreements on grazing arrangements, a subject which has previously inhibited the integration of crop and livestock systems.

Previous experience of ox traction (largely for plowing) in both the Koinadugu District and in the Mabolé Valley has been favourable. Farmers have increased their cultivated area and hired out their oxen to neighbouring farms. The oxen are appreciating assets through live-weight gain and their subsequent sale for meat. Previously introduced implements have had a long, useful life and local blacksmiths have shown some capacity for repair and replacement of worn plow shares (Metianu and Vose, 1986).

Constraints to animal traction

Cattle distribution in Sierra Leone is such that the majority of the cattle (more than 80%) are located in the north and tend to be owned by the pastoral Fulah ethnic group, who perform only limited cropping. Although they are trypanotolerant, N'Dama oxen are prone to disease if put under stress. Health risks appear greater towards the south of the country, and if oxen are exposed to poor animal management practices.

The use of oxen is presently limited to plowing largely on swamp land with some upland plowing and harrowing and some use of ox carts. Most upland areas, however, are not currently suitable for ox plowing due to stumps and rocks which are not removed under existing farming systems. Use of oxen for other operations remains largely untested by farmers due to the major changes required in farming systems, including row planting, row weeding or ridge cultivation.

Labour is a limiting factor in Sierra Leone agriculture, because of the movement of many able-bodied people to urban and mining areas. As a result, in the villages the farmers are

generally quite old. Using work oxen for plowing releases labour at this stage but shifts the labour bottleneck to the weeding stage, and subsequently to harvesting (Kanu, 1984).

The adoption of animal traction is constrained by the state of the rural economy. Average farm incomes are small and very low relative to the initial investment required to purchase implements and oxen. Implements at present available in Sierra Leone are either imported or largely constructed of imported raw materials, and the foreign exchange required for these is in very scarce supply. This is exacerbated by the currency exchange rates, which have effectively depressed farm incomes through low farm produce prices.

The role of the Work Oxen Project

The Sierra Leone Work Oxen Project, in its effort to develop animal traction, has been performing the following activities:

- Organization of village associations for the keeping of work oxen.
- Carrying out on-station and on-farm demonstration trials.
- Training of work oxen and farmers in the villages.
- Catalysing the Integrated Agricultural Development Projects (IADPs) and other institutions and NGOs to develop their own work oxen programmes.
- Participating in agricultural shows and organizing national ox-plowing competitions.
- Equipment production and testing.

The Work Oxen Project is under the leadership of a Project Coordinator responsible for project management and administration. In the project there are seven field officers, assisted by six expatriates. There are sixty junior and intermediate workers in the field and on various stations. Some IADPs have trained their staff in collaboration with the WOP. In the near future, Work Oxen Project staff

should be incorporated into the National Work Oxen Programme of the Ministry of Agriculture, National Resources and Forestry. To ensure project staff are confident at handling animals and familiar with the practicalities of using work oxen, even senior project staff must train a pair of oxen before they are confirmed as full officers (SLWOP, 1986).

The British Overseas Development Administration (ODA) has for several years provided Technical Cooperation Officers (TCOs), together with supporting facilities. At the moment there is one TCO in the project helping in extension and management. Much of the capital assistance and equipment for the project comes from ODA. The French organization AFVP (Association française des volontaires du progrès) has provided the services of four technical volunteers, together with supporting facilities. The French organization CFCF (Comité français contre la faim) has been providing the project with funds and equipment for organizing village associations. The German organization GTZ has provided funds and a consultant for the installation of prototype animal-powered gear systems for water pumping and crop processing.

Through the catalytic role of the Work Oxen Project with the IADPs and other organizations and institutions, several work oxen schemes have been organized and these have helped to develop ox traction in the country. This is evident by the increase in the numbers of work oxen in the country from 30 pairs in 1980, to 500 pairs by the end of 1985. A description of these various schemes follows.

Work oxen schemes: problems and achievements

Mabole Valley Scheme

The Mabole Valley is situated within a transitional area of interior plains with bolilands and savannah mountains and plateaux. The major farming systems include the cultivation

of a combination of upland, boliland and inland valley swamp rice varieties and also some groundnuts.

Some ox plowing has continued since it was first introduced in the 1930s. The area is the major extension target of the WOP, being located close to Rolako Oxen Centre. There are approximately 150 sets of oxen in the area. A survey carried out by a French volunteer in 1984 reported that the 44 oxen sets studied were used for an average of just over 40 days each year (Allagnat and Koroma, 1984). 45% of this time was spent plowing inland valleys for swamp rice, 22% was spent on boliland rice and only 4% on upland rice. Other crops for which oxen were used for plowing included millet (15% of their time) and groundnuts (13%). Responsibility for the oxen was mainly given to young boys. The major result of using oxen was to reduce the labour input per unit area and increase the area cropped (up to 1.2 hectares). Land is not limiting, being available to farmers on payment of a nominal rent of up to Le2 ha⁻¹. (Note: the local currency, the Leone, has changed greatly in value in recent years, so that international comparisons are difficult. At the time of the survey in 1983/4, Le1 = US\$0.17. At the time the Networkshop for which this paper has been prepared, Le1 = US\$0.05.)

The survey also made an in-depth analysis of five farm households, two of which owned oxen. The major cost input for crop production was hired labour, which accounted for up to 80% of total costs. Farmers using oxen were able to meet all their labour requirements for land preparation without hiring labour. Farmers hiring oxen were able to reduce their land preparation costs per hectare by about 35% (from Le267 to Le178). However in all farms the overall gross margins and net farm incomes were small. A large farm of 13 hectares produced a gross margin of only Le2,750 from crop production. Its net farm income was Le4,500, including sales of palm wine and cattle (Allagnat and Koroma, 1984).

Farmers' associations for work oxen

The French organization CFCF has been funding various farmers' associations throughout the country. About twelve of these associations have already been organized. Funds from the CFCF are allocated to the associations according to certain criteria such as the animal traction experience in the area, the economic status of the farmers in the association and the philosophy of the project officer organizing the associations. In some cases, for example where farmers have no knowledge of animal traction but it seems to have great potential, the initial cost of funding the association to allow the purchase of oxen and equipment is provided free, with very little financial contribution by the farmers. In other cases farmers contribute one half of the initial cost.

The associations are organized with two main objectives:

- to introduce oxen in the area through group ownership, so that individual farmers when convinced about the economic importance of the technology can easily buy oxen and equipment for themselves.
- to introduce the use of work oxen for additional farm operations, such as row planting, weeding, groundnut lifting, ridging and transport.

After two years of existence of these associations, results so far have shown:

- Some farmers from the associations have started buying oxen for themselves.
- No farmer has yet started to use oxen for the new cropping operations such as planting and weeding.
- Village transport using oxen is becoming increasingly important and the demand for ox carts is quite high. In one of the villages, the ox cart is used as an ambulance to transport sick people to the nearby clinic; it is also used to transport the chief to nearby villages.

The constraints experienced so far in organizing these associations include:

- Some farmers tend to depend too heavily on the project to provide them with the oxen and equipment.
- There is sometimes poor management of the animals and equipment, and this is especially a problem if somebody with high village status does not participate fully in the association's activities.
- Associations have found it difficult to assign or employ permanent ox-handlers who could then be fully responsible for the day-to-day management of the oxen.

Rolako Station and Oxen Centre

Rolako Rice Station is an establishment of the Ministry of Agriculture, Natural Resources and Forestry (MANR&F) located among bolidays near the centre of the country. It is situated about 200 kilometres along the main road from Freetown (the capital) to the Sierra Leone hinterlands. The station was constructed in 1974 by the Chinese, with a workshop equipped for the maintenance of agricultural machines and adjacent buildings with extensive storage facilities. The facilities at Rolako were underutilized for many years, until it became clear that the station was well suited to become a national work oxen centre. It is situated near the Mabolé Valley, an area with great potential and where oxen are quite widely used. Rolako is also on the main road to Kabela, headquarters of the EEC-funded Koinadugu Integrated Agricultural Development Project (KIADP) which is firmly committed to the development of ox-traction programmes.

Thus the Rolako Oxen Centre was set up in 1982 at Rolako Station and it became the professional headquarters of the Sierra Leone Work Oxen Project. A senior Project Officer responsible for extension and training is in charge of the station. Present activities in the station include:

- Equipment production and testing.

- Training for project staff, extension workers and ox-farmers.
- The demonstration of work oxen operations with various crops, including rice, groundnuts, maize and cowpeas. Also the evaluation and demonstration of animal-powered gears for rice milling, cassava grating and water pumping.

In order to allow the existing facilities to be utilized for the production of animal traction equipment, the workshop was partially re-equipped in 1982, with funds made available from the European Development Fund (EDF). The objective was to enable the workshop:

- to produce plows and other ox-drawn equipment to meet local demand
- to maintain existing plows by ensuring the availability of spare parts and repair facilities
- to modify and design new ox-drawn equipment for testing and evaluation.

The ox equipment workshop was initially set up to assemble plows imported in kit form, or to fabricate them from steel supplied in partially cut form by an overseas manufacturer. The workshop has been equipped with a press, profile-cutter, lathe, grinders, drills and blacksmith forges. The power supply has been from 50-kW and 10-kW generators, and a stand-by portable generator is also available. To date, all imported materials have been provided by aid donors. Table 1 shows the origin, date and type of plow assembled at the workshop.

Table 1. Numbers and origin of plows assembled at Rolako

Year	Donor agency	Plow type	No.
1983	EDF & KIADP	Pecotool	100
1983	France	Bourguignon	40
1984	Plan International	Pecotool	150
1984	Canada	Pecotool	100
1984	FAO	Victory	20
1986	ODA	Pecotool	100
TOTAL			510

On the basis of the research at Njala University College and on-farm testing in several villages, the Pecotool was selected as the most appropriate implement to be made available to farmers. This was because of its simplicity in terms of adjustment and handling and efficiency in soil inversion. Its helicoidal mould-board was found to invert the soil well. It could be used as a 6" (15 cm) or 9" (22 cm) plow and could function as a multipurpose toolbar since a seeder, weeding tines or a ridger could be used in place of a plow body. Farmer reaction had suggested that implement efficiency and quality were more important than price, so that costs were not considered as the major criterion for equipment selection.

The Cows and Plows Scheme

Since 1983, the Work Oxen Project has provided technical advice to the charitable organization Plan International, which has been funding the introduction of work oxen into new villages in the Bombali District. Thirty-two sets of oxen were introduced to thirty village groups within a twenty-mile radius of Makeni in the Plan International operational area.

The objectives of the scheme were:

- To introduce work oxen technology to the Plan-supported villages.
- To train farmers in work oxen technology.
- To organize the Plan villages into committees (associations) in order to manage the ox unit and other agricultural inputs.
- To cultivate 160 ha of swamps and upland fields with oxen within the Plan communities.
- To demonstrate the economics of using work oxen technology.

30 village committees (associations) were organized. Each committee appointed an executive comprising a chairman, secretary, treasurer and an overseer and also provided three ox-handlers to take care of the oxen. The first

set of 20 ox-trainers were trained at Rolako Station and the rest were trained in their respective villages. The philosophy of Plan International involves its endeavouring to help the very poor by providing free assistance. Therefore work oxen and equipment were provided during the first year free of charge, and the association members only had to pay a modest plowing fee for two days (this was Le10/00 per day's work in 1984).

The scheme encountered some problems. In particular some committees lacked the ability to manage their work oxen units, and this led to a relatively high mortality rate, involving ten sets out of the total 32 pairs of oxen distributed in the various Plan villages. Reasons for the deaths were generally related to poor husbandry practices such as limited grazing hours, overworking of the oxen, and provision of poor living conditions in the paddocks. Reasons for these may have been attributable to:

- The Plan International philosophy of giving freely to the very poor meant that some of the committees could not cope with the responsibility of taking care of the oxen, especially during the off-farming season. In some cases it was lack of management skills and in other cases farmers (who had not invested their own money in the oxen) gave priority to other activities.
- In some villages, other socially or economically important activities clashed with the need for supervising the work oxen, and the oxen did not have sufficient time to graze. For example some ox-handlers neglected the care of their oxen during the period when the traditional secret societies were most active. In other cases the key morning hours (from 07.00 to 10.00) were required for tapping palm trees for palm-wine, which provides Limba farmers with a very important source of income.
- The supervision by the Work Oxen Project staff was not very efficient, as indicated by the poor state of some paddocks and the overworking of some animals. Part of this

Table 2. Growth in work oxen activities in KIADP from 1983-1985

Year	Pairs of Oxen	Area plowed
1983	74	450 ha
1984	154	935 ha
1985	250 (estimated)	1518 ha

Source: *KIADP Monitoring and Evaluation Unit (1985)*

could be attributed to the limitations of transport and fuel.

- Animal health services were poor. Some of the oxen died (or the farmers were advised to slaughter them) simply because the Veterinary Department lacked the drugs or equipment to rescue the situation.

The Integrated Agricultural Development Projects (IADPs)

The Integrated Agricultural Development Projects (IADPs) are major rural development programmes and the Work Oxen Project assists them by playing a catalytic role. In particular the Work Oxen Project provides technical information on animal traction and animal-drawn implements and helps the IADPs set up their ox-units through advice and staff training.

Koinadugu IADP and Musaia Ox Unit

The Musaia Ox Unit is part of the Livestock Division of the Koinadugu Integrated Agricultural Development Project (KIADP). The ox unit performs the following activities:

- Extension and the training of oxen and farmers in the villages.
- On-station demonstrations using work oxen to perform various cultivation operations for crops such as rice, cassava, maize and cow-peas.
- Socio-economic surveys on animal traction farmers.

- Monitoring and evaluating the work oxen scheme.
- Providing animal health services for oxen owners.

Work oxen technology has rapidly developed in the KIADP area, as illustrated in Table 2.

Oxen in the KIADP area are used mainly for primary cultivation (plowing) and for harrowing. Oxen are used for the cultivation of rice (swamp and boli varieties), millet, groundnuts and maize. Monitoring and evaluation reports show that, on average, oxen are used for work only 34 days per working season, including 15 days when they are hired out to other farmers. The average hiring fee is Le30 per day, and the ox-owners consider such income to be very significant. The 34 working days include work on two or three different crops, and the reason reported by most farmers for the low usage of the oxen is that they do not have more land that is suitable for plowing with their oxen.

In comparison with other animal traction programmes in the country, the Musaia Ox Unit is very successful, especially in terms of increase in numbers of oxen per year. The farmers have received the technology with great enthusiasm, but there is a lot to be done by the KIADP work oxen extension personnel to ensure that the technology is used more efficiently and economically. At the moment, the use of oxen

is limited almost entirely to plowing and harrowing. Other recommended uses of work oxen in the KIADP area include transport, ridge making, and the use of animal-powered gears for rice milling or for water pumping to allow irrigated swamp cultivation in the dry season.

Since 1984, KIADP has been involved in plow supply, and credit has been given for plow purchase, for oxen or for both. The terms of the loan include interest at 15% and a repayment period of four seasons. Repayment rates were very high for 1984 (97%) and apparently high for 1985 (loans are still being collected). The project placed considerable emphasis on careful choice of loan recipients with prior approval from village elders. A summary of some of the loans is given in Table 3.

The Musaia Ox Unit has been successful for two main reasons. Firstly the programme was based on a comprehensive study of the techniques used in the local farming systems, so that its recommendations satisfy the requirements of the farmers and their crops. Secondly it has had a relatively slow pace of development. This has allowed careful selection of the loan farmers, detailed training and the provision of proper extension follow-up.

The KIADP has room for improvement, and it is recommended that the KIADP management

Table 3. Summary of KIADP Work Oxen Loan Scheme 1984-1986

Year	Loan ¹ (Le)	Plow cost ² (Le)	Oxen cost ³ (Le)	No. of recipients ⁴			Total
				Cash only	Plow only	Both	
1984	1500	250	1400	12	14	24	50
1985	1800	500	1400	15	4	33	52
1986	2800	850	2100				

Notes:

1. Maximum loan available per recipient.

2. Plow prices are those quoted by Work Oxen Project for the Pecotool.

3. Oxen costs in the Koinadugu District are based on a pair purchased at 160 kg each at a price of Le4.40 kg⁻¹ in 1984-5 and Le6.60 kg⁻¹ in 1986.

4. 1986 loan yet to be implemented.

Table 4. Distribution of oxen in Sierra Leone (January 1986)

Location	Project	Number of pairs	Ownership
NORTHERN PROVINCE			
Koinadugu	IADP	250	Individuals & groups
Koinadugu (Fadugu)	WOP	18	Individual
Mabole Valley (Bombali)	WOP	150	Individuals & groups
Seed Multiplication (Bombali)	SMP	1	Project
Cows and Plows (Bombali)	PLAN/WOP	25	Groups
Rolako (Bombali)	WOP	3	Station
Port Loko	WOP	3	Groups & station
Bumbuna/Mapaki	Catholic Mission	3	Mission
Magbosi	IADP	9	Groups & project
North West	IADP	2	Project
Rice Research Station	Institution	2	Institution
Seed Multiplication (Kobia)	SMP	2	Project
Gbendembu School	Institution	1	Institution
Lunsar School	ARCB	2	Institution
Bafodia	Mission	5	Mission
Subtotal: Northern Province		478	
SOUTHERN PROVINCE			
Njala	WOP/NUC	9	Various
Moyamba	FAO	3	Project
Tikonko	Methodist Church	5	Project
Pujehun	SAIDAC	6	Institution
Subtotal: Southern Province		24	
EASTERN PROVINCE			
Kenema	SMP	2	Project
Foindu	WOP	1	Group
Subtotal: Eastern Province		3	
WESTERN AREA			
Newton	WOP	2	Individuals
Pa Lokko	PLAN/UMC	2	Institution
Subtotal: Western Area		4	
GRAND TOTAL (SIERRA LEONE)		509	

should put more resources (notably transport) at the disposal of the ox unit. The ox unit should adopt a staffing policy in line with the national programme, so that expatriates should have counterparts of a comparable level of training. Finally more on-farm and on-station demonstrations should be organized to encourage diversification of work oxen oper-

ations. This would enable draft animals to be efficiently and economically used by the farmers.

Magbosi IADP

Magbosi IADP started its draft animal programme in 1984 with great enthusiasm, and in

close cooperation with the Work Oxen Project. Six pairs of oxen have been trained for village demonstrations, and a pilot hire scheme has been started in the various chiefdoms in the project area. Six of its extension workers were given specialized training by the Work Oxen Project, both at Njala University College and in ox-using villages in the Bombali District. A large-scale ox-programme is to be started in early 1987 by the Project through funds from IFAD.

North Western LADP

The NWIADP based at Kambia has started a pilot draft animal programme in cooperation with the Work Oxen Project. The Work Oxen Project sent two of its field staff to train the NWIADP field staff in work oxen techniques and to assist the training of two sets of oxen. The programme at present is on an experimental basis comparing work oxen to power tillers for working in inland valley swamps. There are now funds available for training and distribution of 25 sets of oxen and equipment to farmers' groups and individuals. The NWIADP project area has been extended into the Port Loko District with finance from the EEC. An ox-unit component proposal has been incorporated into the project document, and its implementation is to start at any time. In the first year, twelve sets are to be trained and distributed to farmers' groups and twenty-four sets in the following year.

Tikonko Agricultural Extension Centre (TAEC)

TAEC is based in Bo in the Southern Province and it is developing animal traction in the villages around Tikonko. Six sets of oxen are working in the centre and the surrounding villages. The centre has developed a wooden ox cart that has both wheels and its bearings made of wood. The cart has been tested in the TAEC operational areas and the Work Oxen Project

has ordered one for trial at the Mabolé Valley. TAEC is also training oxen and staff for SAIDAC (Southern Agro-Industrial Development and Agricultural Centre). This institution has distributed six sets of oxen in the Pujehun District on a hiring basis to farmers. There is great potential for ox-traction in the Pujehun District since there are a number of large but widely separated cattle ranches in the area and extensive bolilands and inland valley swamps.

Other projects and organizations

MANR/FAO Swamp Rice Project started an ox unit this year in the Moyamba District in the Southern Province. A Peace Corps volunteer is responsible for the ox unit with two Work Oxen Project field staff. The project is organizing farmers' associations for using work oxen for swamp cultivation. A demonstration pair of oxen at Waterloo Village is doing well and this has boosted the interest of farmers' and the project. For the next two years the project will introduce seven sets of oxen through the farmers' associations. Thirty farmers associations are expected to be organized using both work oxen and power tillers. Comparisons of both work oxen and power tillers will be made, considering aspects such as adaptability, economics, availability of spare parts and social aspects. Farmers in this area are not used to cattle husbandry, although they have been working with power tillers for some time. Useful reports are to be expected from this project.

Other organizations using work oxen are the Seed Multiplication Project and the Rice Research Station at Rokupr. These institutions use work oxen in their respective centres for the cultivation of inland valley swamps. The staff of these institutions were trained by the Work Oxen Project.

Table 4 provides a summary of the distribution of work oxen by location, together with an indication of the promoting organizations.

References

- Allagnat, P. and Koroma, B. 1984. Socio-economic survey of the use of ox traction in the Mabolé Valley, Bombali District. Sierra Leone Work Oxen Project and Association française des Volontaires du Progrès, Freetown, Sierra Leone. 119p. (E,F).
- Kanu, B. H. 1984. The economics of work oxen in Sierra Leone. Sierra Leone Work Oxen Project, Freetown, Sierra Leone. (unpublished). (E).
- KIADP 1985. Monitoring and Evaluation Reports of Musaia Ox Unit. Koinadugu Integrated Agricultural Development Project, Kabala, Sierra Leone. (unpublished). (E).
- Metianu, A. A. and Vose, D. 1986. Report of visit to Sierra Leone in January 1986 to study the viability of the Work Oxen Project. Overseas Division, National Institute of Agricultural Engineering (NIAE), Silsoe, UK. (unpublished). (E).
- SLWOP 1986. Report of the Project Coordinator. Sierra Leone Work Oxen Project, Freetown, Sierra Leone. (unpublished). (E).
- Starkey, P. H. 1981. Farming with work oxen in Sierra Leone. Ministry of Agriculture, Freetown, Sierra Leone. 88p. (E).
- Starkey, P. H. and Kanu, B. H. 1985. Animal traction in Sierra Leone. pp. 35-36 in: Poats, S. et al. (Editors), Animal traction in a farming systems perspective. Proceedings of Networkshop held March 1985, Kara, Togo. Network Report 1, Farming Systems Support Project, University of Florida, Gainesville, USA. 187p. (E,F).

Abbreviations and local terms

AFVP	Association française des volontaires du progrès
ARCB	Agricultural Rehabilitation Centre for the Blind
CFCF	Comité français contre la faim
EDF	European Development Fund

EEC	European Economic Community
FAO	Food and Agricultural Organization of the United Nations
IADP	Integrated Agricultural Development Project
IFAD	International Fund for Agricultural Development
KIADP	Koinadugu Integrated Agricultural Development Project
MANR&F	Ministry of Agriculture, Natural Resources & Forestry
MIADP	Magbosi Integrated Agricultural Development Project
NGO	Non-governmental organization
NUC	Njala University College
NWIADP	North Western Integrated Agricultural Development Project
ODA	Overseas Development Administration (UK)
SAIDAC	Southern Agro-Industrial Development and Agricultural Centre
SMP	Seed Multiplication Project
TAEC	Tikonko Agricultural Extension Centre
TCO	Technical Cooperation Officer
UK	United Kingdom
UMC	United Methodist Church
WOP	Work Oxen Project
Bolis	Bolilands are flat grasslands with poor soils that flood for one to four weeks every year.
Le	Leone, the local currency. The Leone has changed greatly in value in recent years, so that international comparisons are very difficult. In 1983/4 (a period to which some of the figures refer), Le1 = US\$0.17. At the time of the Networkshop in 1986, Le1 = US\$0.05.