Assisting African Livestock Keepers

The experience of four projects

edited by
Clare Oxby

Overseas Development Institute

Agricultural Administration Unit

Occasional Paper 12

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This Occasional Paper is the English edition of a selection of papers on African livestock development collected and translated for a French-speaking audience. All the papers presented here originally appeared in the *Pastoral Development Network*, a bi-annual publication by ODI which began in 1976 and to date has published over 150 papers on research and applied work amongst pastoralists throughout the world. The papers describe conditions prevailing at the date of original publication, which is given in a footnote at the bottom of the first page of each chapter.

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Introduction

The papers in this book, all originally published in the ODI's Pastoral Development Network, refer to a range of subjects within pastoral development: animal health (para-vets), animal feed (fodder banks), range management (grazing cells) and post-drought recovery (restocking), but all emphasise the need for the participation of livestock-keepers in project management. They cover a wide geographical range within Africa (Nigeria, Sudan, Kenya and Botswana), and include projects both in subhumid and in semi-arid regions. The development institutions involved range from large multilateral agencies to a small Sudanese NGO.

The first paper, on animal health, describes an example of an increasingly popular approach to the delivery of veterinary services, namely the training of herder specialists (whether they are called para-vets, barefoot vets, veterinary auxiliaries, nurses or scouts, etc). The project has been a notable success in terms of the number of livestock vaccinated, particularly given the extremely difficult circumstances in south Sudan. Nonetheless, this approach is not without its problems, including legal restrictions on the handling of drugs by non-professionals, problems of linking herder specialists to local veterinary departments and questions about the remuneration of herder specialists. The paper discusses the main problems encountered in south Sudan.

The second paper is about range management, and lists the conclusions to be drawn from six years of work in Botswana on establishing fenced grazing areas (called grazing cells because of their cell-like appearance from the air, radiating out from a central water point). Units of 2,340 ha were enclosed, and subdivided for rotational grazing. Each unit was managed by a registered group of local livestock-owners, who herded a total of 300 of their own cattle in it. The scheme was not a success, and the value of the paper lies in the author's discussion of its shortcomings and unexpected problems.

The fundamental problem identified by the author was the unwillingness of the livestock-keepers to limit stock numbers within the grazing cells, or to recognise the problem of overgrazing as perceived by project authorities. On the contrary, herders were reluctant to fence off part of the communal range for the exclusive use of some people, because they knew that this would only increase the grazing pressure on the already overcrowded areas outside.

The third paper is about improving livestock feed in the subhumid zone of Nigeria: it describes the achievements and problems faced during the course of a research project set up to involve livestock-keepers in fencing off a small plot of land near their homestead and in supplementing the natural pastures therein with a forage legume (*stylosanthes*) for use during the dry season by their own cattle. As with other comparable attempts to involve herders in

cultivating fodder plants (eg the many schemes for cultivating 'bourgou' grass in the flood plains of the river Niger in Mali), the most serious and recurrent problems are managerial rather than technical. A recurrent problem has been controlling access to the fodder, either by limiting the number of animals sent to graze it, or by restricting the number of weeks in a year when animals are allowed access to the improved resources. Unlike the river Niger schemes, where herders are often grouped together in the hope that they will make and keep to joint decisions about the use of the fodder, in this case plots are managed by individual household heads, in order to allow for the different judgements of the various herders.

The paper relates how herders failed to restrict access to the improved plots to productive female livestock only, as the researchers had hoped; but they did restrict use in accordance with their own herding strategies. These strategies are described in detail, especially the way they are related to seasonally variable factors such as dry season forage availability, the splitting of herds to make use of different grazing areas, and the availability of herding labour.

The final paper is an evaluation of four restocking projects set up in various parts of Kenya with support from Oxfam. The practice of helping poor livestock-keepers to build up their herds has become an increasingly popular form of assistance in the aftermath of the Sahelain drought of the early 70s. The 80s have seen a multiplication of these schemes throughout Africa, in particular the creation of many small schemes. Oxfam has supported several of these schemes in francophone and anglophone Africa, of which the Kenyan ones are perhaps the most ambitious.

Although it is clear that restocking has benefitted many families by enabling them to return to their previous and preferred way of life, there are differences of opinion about several aspects of these projects: whether the stock should be a gift or a loan; whether to select as recipients destitute people or near-viable herders; and how to organise the monitoring of restocked herds. These are some of the questions discussed in the light of the performance of the Kenyan schemes[1].

All of the papers are united in a central but unspoken message: namely the importance of involving livestock-keepers in the management of the services and improved resources provided by development programmes, and the importance of listening to herders during the implementation stage, in order to adapt the details of the project in response to their felt needs.

This book is being published simultaneously in English and French. Barriers of language and cultural allegiance separate English-speaking and French-speaking Africa, nowhere more so than in the subtle details of development thinking and the design of projects and programmes. It is not simply a question of the intrinsic differences between anglophone and francophone regions: many

[1] For a more detailed evaluation of Oxfam's Kenya restocking projects see: Fry, P. 1988 *Evaluation of Oxfam's four restocking projects in Kenya* Oxfam Report.

bilateral aid organisations are solidly monolingual in their thinking and their output, and this tends to accentuate these differences. Governmental aid and technical support is largely restricted within these language barriers, and therefore does little to reconcile the different approaches. Some of the non-governmental organisations do frequently work across these barriers, but even then they tend to retain their monocultural and even monolingual approach. A large British NGO, for example, has gradually increased its operations in francophone Africa since the Sahelian drought of the 70s but, as yet, all the main documentation arriving from its headquarters is in English, untranslated, and therefore inaccessible to the majority of the local staff employed by the agency.

Even the large multilateral aid organisations are not always blameless. They may operate in different languages where appropriate; but there does tend to be a subtle divide between their French-speaking personnel, whose work relates mainly to francophone countries, and their English-speaking personnel, whose work relates mainly to anglophone countries.

There is no easy solution to this problem, as translation is time-consuming and expensive, and the linguistic competence of so many development experts is limited - especially when compared with some of the African communities in which these work. Also, there may be no satisfactory translation of development concepts which arise out of very different intellectual traditions: for example, it is difficult to translate the term 'animation' into English.

This book is an attempt at bridging some of these gaps, and at promoting further communication across the English/French language and cultural divide in Africa, in the particular area of pastoral development.

The Overseas Development Institutes's Pastoral Development Network has, since its origin in the late 70s, included members from francophone Africa; only one of its papers, however, has been translated into French, and none were originally written in French. Against this background it has been decided to select four recent papers for translation into French with a view to dissemination in francophone Africa.

The papers have been selected in order to present to francophone readers the results of recent initiatives in pastoral development in anglophone Africa. It is not implied that there are no such experiences in francophone Africa. These papers describe initiatives which are in many cases comparable to development projects and programmes in francophone Africa, and it is hoped that readers will find it useful to compare these initiatives with the more familiar ones in their own countries, to reflect on the differences in outlook, and to learn from the successes and failures of these schemes. The papers do not all describe unqualified success stories; their value lies instead in the way that the initiatives, including all their achievements and their faults, are described and analysed knowledgably by persons who have been closely involved with them.

1

A Para-Vet Programme in South Sudan[1]

Melvyn Almond

Background

ACCOMPLISH (Action Committee for the Promotion of Local Initiative in Self-Help) is a local self-help group in Terekeka District of Equatoria Region, South Sudan. The tribe inhabiting this area is the Mundari. They are a pastoralist people with a population of approximately 700,000. The Mundari keep cattle, goats and sheep. The cattle population is estimated at 150,000 head. Estimates of goat and sheep populations are not available but their numbers are large. Oxfam has been assisting ACCOMPLISH in various development activities, including rehabilitation of roads, re-stocking, tree planting, livestock and health.

The level of veterinary care available to stock owners in the district has been very low for several reasons:

(i) the almost total lack of veterinary pharmaceuticals and equipment in Equatoria Region;
(ii) the lack of trained veterinary staff stationed in the district;
(iii) the inability of the government veterinary service to mount vaccination programmes due mainly to the lack of resources available to it.

Epidemics of Rinderpest regularly occur in the district and often cause massive losses to individual stock owners. Other diseases such as Contagious Bovine Pleuropneumonia (C.B.P.P.) and Haemorraghic Septicaemia (H.S.) are also common and account for considerable losses. In addition to these diseases, Trypanosomiasis and the tick-borne diseases occur seasonally and are responsible for additional stock losses.

In practice, because no organised system of animal health care existed in Terekeka district, cattle owners have had to rely on their traditional methods. However, in the face of major epidemics these methods are not effective. Some cattle owners are aware of the value of modern antibiotics but as mentioned earlier these are rarely available to them.

[1] This paper was originally presented at the Arid Lands Management workshop organised by Oxfam and held at Cotonou, Benin, 23-27 March 1987 and was published as ODI Pastoral Development Network Paper 24c in August 1987.

Civil war in Southern Sudan caused major losses of cattle through cattle raiding. This forced stock owners to move their herds into less suitable areas. The Mundari had to concentrate their cattle into smaller grazing areas, often located within Tsetse fly infested woodlands. The higher stocking rates have facilitated the rapid spread of disease. It thus became imperative that a system for the provision of prophylactic and therapeutic veterinary medicine be available if the cattle herds of the Mundari, and consequently their way of life, were to be preserved.

Description of the Scheme

The Concept

The concept of the para-vet scheme was based on a proposal for a similar scheme of 'barefoot vets' in the Turkana district of Kenya[2]. Suitable men would be selected by the chiefs in the district. Selection would be based on their being well known for their abilities to handle cattle. Terekeka district is divided up into area courts and each court was allocated a number of para-vets based on the estimated population of that area court. Once selected, the para-vets would undergo training in basic veterinary health care. After completing the training course, they would then be in a position to provide their community with a veterinary health service. Animal health drugs, such as antibiotics and antihelminthics would be made available to them through ACCOMPLISH, and they would then be able to administer them in a correct manner in the field.

Implementation

A livestock adviser was provided by Oxfam to ACCOMPLISH, in order to start the para-vet programme. The first stage involved the convening of a meeting with the local chiefs to explain the concept of the scheme to them. All the chiefs expressed great enthusiasm for the project and agreed to select suitable people for the job. At this juncture it is worth mentioning that the paramount chief for the Mundari, Chief Enoka Mojut, played a major role in obtaining the co-operation of the communities involved. Chief Enoka had been trained in 1949, during the British Colonial Administration of South Sudan, as a government veterinary assistant. His background knowledge, enthusiasm and hard work proved to be vital as the programme progressed.

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[2] While the Turkana proposal was in the end not implemented, *Pastoral Development Network Paper 11c* by Brendan Halpin, 'Vets - Barefoot and Otherwise', ODI 1981, also discusses the para-vet approach.

Training

After the selection of the para-vets, the training course commenced. Originally, training should have taken place in the district, but due to insecurity some of the para-vets were brought to Juba and trained with the help of a government veterinary officer at a local government farm.

Training involved the recognition of the various different diseases occurring in Equatoria Region and the appropriate treatment for the disease. Great emphasis was placed on the idea of 'prevention is better than cure', and the role that vaccination has to play in this respect. Where antibiotics, antihelminthics or other drugs are being used we stressed the importance of correct dosage. Stock owners with access to antibiotics usually underdose by a large margin, in the interests of economy, which of course is counter productive in that resistance to drugs is often induced.

As vaccination of stock against Rinderpest, C.B.P.P and H.S. is of primary importance in any African animal health care programme, we spent a lot of time training the para-vets in the correct handling of vaccines. Much emphasis was placed on their proper storage and transport in the field. The para-vets were supervised during field trips to cattle camps, where they vaccinated cattle. After 3 weeks of vaccination work most of the para-vets had reached a satisfactory standard.

Vaccination Programme

During the training course it became clear that the para-vets could constitute a very effective vaccination team in the district, provided they were properly supervised. The need for a vaccination programme had been recognised 6 months previously by Oxfam and a veterinary team from the ministry had been assisting in this respect. Oxfam had encountered difficulties in implementing this emergency programme mainly because of personnel problems within the ministry team. We felt that many of these problems could be overcome if the para-vets were to perform the vaccinations. The para-vets from Tali Post area were transported back there and embarked on a Rinderpest vaccination programme under supervision. It soon became clear that through their better contacts with the local people they were able to implement the vaccinations much more effectively. For example, the para-vets were prepared to stay in the cattle camps overnight. This meant that they were able to start vaccinating very early the next morning. The Mundari tether their cattle overnight in camps. It is too risky to allow cattle to roam free because of the threat from predators and cattle raiders. In the early morning a team of para-vets can vaccinate large numbers of cattle in these camps very easily as most are lying down. During the months of March, April and May 1986, the Tali Post para-vet team (10 para-vets) vaccinated 30,000 head of cattle. The demand from cattle owners was very great.

Cold Chain

Fundamental to the success of the vaccination programme was the effectiveness of the cold storage facilities. Most vaccines must be stored in cold or freezing conditions. ACCOMPLISH had been provided with excellent cold storage facilities by Oxfam and the British Embassy in Sudan. The cold chain comprised of a freezer and fridge in Juba and kerosene refrigerators in Tali Post and Terekeka Towns. It was thus possible to store quantities of vaccine in the district and this greatly reduced the time needed for the transport of vaccine to cattle camps. The cold boxes and thermos flasks used in the programme also proved invaluable in its successful implementation.

Financial Considerations

The arrangements between Oxfam and ACCOMPLISH regarding the provision of drugs and vaccines allowed for the creation of a revolving fund from their sale. All drugs and vaccines were initially paid for by way of a grant made available by Oxfam to ACCOMPLISH. A system for pricing of drugs and vaccines was drawn up after discussion with the ACCOMPLISH Executive Committee and the Department of Veterinary Services. The prices charged were to reflect their real cost and include a small margin (10% of the cost price) for the para-vets. The revolving fund would be used to purchase drugs and vaccines available in Khartoum in the future.

In general, stock owners showed little or no resistance to paying for Rinderpest vaccinations. This is probably due to the fatal nature of this disease and its ability to spread rapidly. Regarding the diseased H.S. and C.B.P.P. stock, owners were less likely to request vaccine. Probably this was because mortality is intrinsically lower and these diseases do not usually occur as major epidemics.

The arrangement regarding the use of drugs has been that para-vets request supplies of drugs such as antibiotics and trypanocidal drugs for particular cattle camps. After administering these drugs, the para-vet will remit revenue to the district supervisor or the Juba office and receive 10% of the value of the drugs.

When the para-vets are required to work together as vaccination teams they are paid, on a daily basis, from funds raised through vaccine sales. This system has worked well.

Results

Achievements

About sixteen out of the 21 para-vets originally selected are working well and have proved to be capable, practical people. In Tali Post area the local supervisor has developed an excellent working relationship with the 10 para-vets in his area. The para-vets are normally in their villages or cattle camps and will bring any information about disease problems to the supervisor, who will take appropriate action. If a vaccination campaign is necessary the supervisor will call for the para-vets and set up a team.

The total number of cattle vaccinated so far is as follows:

150,000 head vaccinated against Rinderpest
50,000 head vaccinated against H.S.
2,000 head vaccinated against C.B.P.P.

The Tali Post team were particularly successful in vaccinating against Rinderpest. During the months of March, April, May and June 1986, 40,000 cattle were vaccinated. This is mainly due to the good team work that has developed. The stock owners are convinced of the effectiveness of the campaign and they have informed their neighbours and suggested they bring their cattle for vaccination. The Tali Post team has vaccinated a large number of cattle belonging to the neighbouring tribe (Dinka) who are keen to have their cattle protected.

As mentioned earlier, good cold storage facilities ensured that vaccines were in good condition when used in the field. The supervisors in Tali Post and Terekeka were able to maintain the refrigerators in good working order.

On the whole, the system for the dispensing of drugs has worked reasonably well. Para-vets purchase antibiotic and trypanocidal drugs and administer them in the field. New, more effective drugs have been introduced and cattle owners are now keen to use them. This is particularly true in the case of a Trypanocidal drug called 'Berinil'. This drug will bring about an immediate cure to cattle trypanosomiasis. The para-vets have used this drug a great deal in the last few months. Insecurity had forced the cattle owners to move their stock into heavily wooded areas where Tsetse flies are abundant. Cattle trypanosomiasis thus became a major threat to herd survival but we were able to reduce the number of deaths by using Berinil.

A revolving fund has now been set up at ACCOMPLISH and over Ls. 50,000 (Sudanese pounds) has been collected from the sale of vaccines and drugs. These funds are now available for the purchase of further supplies of drugs, vaccines and any items of equipment needed. The revolving fund will also be used for the maintenance of vehicles used for the para-vet programme. The ACCOMPLISH vehicles are vital to the success of the

programme as they are needed for the transport of drugs, vaccines etc. to Tali Post and Terekeka Towns. They are also necessary to assist in the transport of para-vets to outlying cattle camps during vaccination campaigns.

A veterinary officer has been seconded from the Directorate of Veterinary Services to ACCOMPLISH to act as the technical advisor. This particular officer has been involved in the para-vet programme since its inception and has proved to be a great asset to ACCOMPLISH.

A simple laboratory has been set up at ACCOMPLISH to aid diagnostic work. This facility has enabled us to confirm the presence of various diseases, eg. trypanosomiasis. Subsequently, the ACCOMPLISH veterinary officer and the livestock advisor were able to confirm an outbreak of East Coast Fever. This was the first time E.C.F. had been recorded in Mundari cattle. The implications of this disease outbreak were very serious since it has a reported mortality rate of 80% or more. Indeed, some cattle owners have already sustained heavy losses to this disease. With prompt assistance from Oxfam an effective drug was imported from the U.K. and the para-vets and supervisors were trained in its use. Cattle owners are greatly relieved that an effective campaign is now proceeding. ACCOMPLISH has enhanced its credibility with cattle owners during this latest campaign.

Throughout the duration of the para-vet programme the Regional Government of Equatoria has given its full support. In practice, this has meant that ACCOMPLISH has been able to import a full range of veterinary drugs, vaccines and equipment. The Department of Veterinary Services and Livestock Development has provided technical assistance whenever necessary.

Problems

The major problem encountered has been the effect of the civil war on the Mundari community. This has forced them to evacuate a large portion of their homeland with their livestock. Losses of livestock have been great due to raiding and disease outbreaks that have been triggered off by the stress of movement, poor grazing etc. Epidemics of C.B.P.P. and East Coast Fever were the direct result of overcrowding of cattle into restricted areas around Juba Town.

General insecurity in Terekeka district prevented staff from travelling there for long periods. Under the circumstances it is commendable that vaccinations were still going on. This indicates the high degree of commitment from the ACCOMPLISH staff. Chief Enoka Mojut and the supervisor in Tali Post town were instrumental in maintaining activities in the district during these difficult periods.

While demand is as strong as ever, maintaining supplies of drugs and vaccines to Tali Post and Terekeka is becoming increasingly difficult. Every

effort is being made to deliver supplies of Rinderpest vaccine and other drugs. Several of the selected para-vets from the east of Terekeka district have not received thorough training because of the disruption caused by civil war. We hope to be able to involve them in the current E.C.F. campaign and with supervision their performance should improve. The co-operation from cattle owners in the east of Terekeka district has been poor when compared to the west side. This may be directly attributable to the lack of para-vet activity in that area.

The problem of para-vet mobility has occurred several times. For example, if a disease occurs in a particular cattle camp which is a long distance away from Terekeka or Tali Post, it may take some days before a para-vet can report to the supervisor. The possibility of using bicycles has been discussed.

Finally, it was originally conceived that the paravets should receive a percentage of the revenue collected from the sale and use of drugs. Some of the para-vets had become discouraged at this system as they felt they were not receiving enough financial remuneration for the job. ACCOMPLISH has arranged to supply 'food for work' and this seems to have solved the problem temporarily; however, it cannot be regarded as a long term solution. An alternative system of financial remuneration may have to be devised.

2

The Communal Grazing Cell Experience in Botswana[1]

R. J. Sweet

Introduction

In 1975 the government of Botswana introduced the National Policy on Tribal Grazing Land (White paper No.2 of 1975), known as TGLP. Tribal grazing land was zoned into *Communal Areas*, in which communities retained collective land rights; *Commercial Areas*, in which leasehold rights were granted for ranching purposes; *Wildlife Management Areas*, in which wildlife utilisation was the primary form of land use but domestic stock were permitted; and *Reserved Areas* intended to be a reserve for development by future generations.

In 1978 the World Bank commenced funding Botswana's second Livestock Development Project (LDP II) to support livestock development, particularly TGLP, over the next five years. To address the issues of grazing control and better range management in the communal areas, the Animal Production Research Unit (APRU) was directed to establish twelve communal grazing units using communal area cattle, and a further two control units stocked and managed by APRU.

Objectives

The objectives of the communal area grazing units were twofold: firstly, to provide a practical demonstration of improved range condition and cattle performance through grazing management and control of stock numbers; secondly, to enable a comprehensive evaluation of different grazing systems for the rehabilitation of degraded rangeland.

APRU (1976, 1977) had documented the differences in productivity between 'traditional' and 'reasonably acceptable' management. It was intended that the communal grazing cells would realise the same improvements in liveweight gain and fertility by a) parasite control, and b) unrestricted access to grazing, water and phosphate supplement.

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[1] Originally published in February 1987 as ODI Pastoral Development Network Paper 23b.

Trials on APRU ranches had failed to demonstrate any consistent advantage of rotational over continuous grazing. However, in Zimbabwe and South Africa, claims were being made of carrying capacities being increased and degraded range improved through short duration grazing. It was therefore intended that the twelve communal grazing cells would implement four different grazing systems in each of the three major ecological zones of Botswana. Each communal cell would practice only one grazing system but there would be sufficient area (block) replication so that together with the two control cells, which would both have three grazing systems with two replicates, they would enable a thorough evaluation of the grazing systems.

In contrast to the group ranches, which made new grazing available, the communal grazing cells were to be located within the overgrazed zones surrounding villages, in order to demonstrate improved management of the existing grazing resources.

Description of a communal grazing cell

The basic concept of a grazing cell was a peripheral fence around a water source, with all management facilities located at the centre. Subdivision was achieved by fences radiating from the centre in a wagon-wheel layout. In practice, the shape of the planned grazing cells was adapted to suit local topography (APRU, 1980) but was based upon a hexagon. The cellular design and the intention that the units would be replicable gave rise to the name 'grazing cell'.

The model cell would have 3 km sides, enclosing an area of 2,340 ha, and accommodate 300 head of cattle. In practice, it was necessary to increase the size in inherently lower carrying capacity areas (e.g. the western Kalahari).

APRU had shown that with reasonable management, weaners could achieve in two years suitable liveweight and condition for slaughter. Young stock were considered to be the class of animal most responsive to improved management. It was therefore recommended that the communal cells be stocked with weaners of 7-12 months age and maintained for two years. A fully operational cell would thus have a throughput of 150 head/year. For simplicity of management it was originally proposed that only castrated males be accepted; this was later relaxed to include heifers.

The grazing cells were communally owned and operated, stocked with cattle from the community. They were intended for small cattle owners without sufficient cattle numbers or mobility to participate in the group ranching scheme. A prerequisite for the funding of a grazing cell was the registration of the participants as an Agricultural Management Association (AMA) to give the group 'body corporate' status with limited liability.

After registration, construction of the cell could begin on a site selected by the group and approved by APRU. Peripheral fencing, paddock

subdivision, a central watering point and handling facilities were provided. In addition, the government (APRU) undertook to provide a ranch manager for a period of up to five years, to allow for the training of a manager appointed by the group and to ensure a smooth transfer of responsibility.

All construction costs were covered by the LDP II funding and the salary of the interim manager was paid by government. Only the operating costs such as infrastructural maintenance, labour wages and the purchase of consumables had to be found by the group, and these were to be met by a head levy payable to the treasurer. In 1981 the head levy recommended by APRU, on the basis of estimated fixed and variable costs, was P10 to P12 per head per year. In 1985 the head levy was recalculated in more detail for Ntimbale.

The conduct of the AMA and the operation of the communal grazing cell were at least partially controlled by two documents: the constitution, and the annual management plan. A constitution suitable for grazing cell AMA's was drafted by staff of the Commissioner of Agricultural Management Associations, and subsequently modified according to suggestions by APRU. The management plan was drafted by APRU. Its purpose was to provide a set of guidelines and a management calendar for improved management practices.

A communal grazing cell was therefore defined as 'a ranching unit that is communally grazed, operated and owned by registered members of an Agricultural Management Association, and which has the objective of improving range condition and animal production'.

The extension effort

The registration of a group as an AMA for a communal grazing cell involved various stages with inputs from different quarters. First a community interested in improving the status of their grazing was identified by the extension staff of the Ministry of Agriculture. Next, APRU addressed one or more kgotla meetings to explain the purpose, mode of operation and advantages of communal grazing cells. The local Agricultural Demonstrator (AD) was fully briefed, issued with descriptive material and charged with maintaining the group interest, answering questions and providing liaison between the group and APRU. Simultaneously the Agricultural Management Association Officer (AMAO) would start the task of formalising the group and leading it through to registration as an AMA. A site for the cell was selected by the group and approved by APRU, then an application was made to the Land Board to grant exclusive use of the site to members of the grazing cell AMA. Plans for the fencing, water reticulation and handling facilities were drawn up by APRU and tenders invited for the siting and drilling of the borehole, and

for construction of the cell. Work could begin only after registration of the group.

For a control cell, construction could begin as soon as a site was approved by the landboard, as there was no group involved.

The target was to have twelve communal cells and two control cells in five years. Listed below are the localities and groups which received active extension efforts.

1. **Malkhi.** Situated northwest of Serowe in Central District, this was a cattlepost run under traditional management for many years until the death of the owner in 1978. The site became available to APRU and in 1979/80 the Malkhi Control Cell was established around the original borehole.

The cell supports three grazing systems (1, 3 and 9 paddocks per herd) with two replicates. It is stocked with castrated male Tswana-type weaners purchased from local cattle owners and sent to slaughter at the Botswana Meat Corporation after two years. The results to date show that excellent carcass weights and grades can be achieved two years after weaning, even on degraded sandveld, where the principles of adequate grazing, water, phosphorus supplementation and veterinary care are applied. Rotational grazing has not proven advantageous over continuous grazing (APRU Annual Reports, 1980-84).

2. **Ntimbale.** In mopaneveld in North East District, this was the first area selected, the first group registered and the first (and only) communal grazing cell constructed. More details are presented in the case study later in this report.

3. **Sefhophe.** Situated south of Selibe Phikwe in Central District. The first kgotla meeting addressed by APRU staff to promote the idea of communal cells was held in July, 1980. Reaction was favourable and a further meeting of interested cattle owners was held, during which more details of the scheme were explained and the steps towards registration as an AMA outlined. Over the following eighteen months various visits to Sefhophe were made by APRU staff, the AMAO and a senior representative of the Commission of Agricultural Management Associations. A site for the cell was selected, but interest waned and the group never registered as an AMA.

4. **Monwane.** Located northwest of Molepolole in Kweneng District, the first meeting was held in August 1979 and was attended by approximately fifty people. The grazing cell scheme was explained and AMA booklets distributed. Subsequently a committee was elected and with the help of the AMAO a constitution was drafted, but was lost by the

committee. Further meetings were held in 1980 and a sample constitution was given to the committee to help them draft their own. The expatriate AMAO left Botswana at the end of his contract, his replacement was without transport and for a year there was no AD, so there was little progress. With the arrival of a new and enthusiastic AD, interest was revived and in 1983 the group became registered as an AMA. A water survey was commissioned and a borehole drilled but it proved to be blank. A second survey was conducted but no water was located. The World Bank funding period, which had been extended from June 1983 to March 1984, was coming to an end and there was pressure to release the funds for use in other sectors. The Monwane project was therefore abandoned.

5. **Rakopa.** The area was selected as one of the most devastated by overgrazing in Botswana. In December 1980 a village meeting was arranged by the AD and addressed by APRU. Only seventeen people attended as many were out ploughing, however, great interest was expressed in the possibility of establishing a communal grazing cell. Unfortunately the expressed interest never developed into action and gradually hope faded of establishing an AMA or a grazing cell.

6. **Bodibeng.** This village is situated in a high cattle density area near to Lake Ngamiand. Various meetings were addressed by the AMAO and APRU, but while interest was shown in the potential advantages of a communal grazing cell, there was reluctance to be organised by the extension staff. There was also antipathy to fencing, and no real progress was made.

7. **Kang.** In this village in Kgalagadi District a meeting was held in November 1980 to explain the communal grazing cell concept. A group of sixty to seventy members had already applied for registration as an AMA for the purpose of forming a group ranch. Those present at the meeting were in favour of establishing a communal grazing cell. However, there was no AD based in Kang, follow-up was slow and intermittent, and interest in the grazing cell was lost.

8/9. **Hukuntse and Lehututu.** These two villages typify the overgrazing pattern in the western Kalahari; kgotla meetings were addressed by APRU in November 1980. Considerable interest was expressed in the possibility of establishing communal grazing cells. However, the villagers said they had received many unfulfilled promises of help under the Matsheng Land Use Plan and were sceptical of the likelihood of the grazing cells becoming reality. Liaison with the groups was maintained with the help of the District Agricultural Officer based in Hukuntsi. Sites for the grazing cells were selected and approved; the two groups were registered as AMA's in

1983. Tenders were called for the boreholes and for construction of fences and handling facilities. Only two possible sites for water were detected at each location; all four sites were drilled but no suitable water was found. Without water the grazing cells could not function. As the World Bank funding period was at an end, attempts to establish these grazing cells were abandoned.

10. **Site for second control cell.** No suitable site for a second control cell could be found. Various possibilities were considered but did not meet the criteria of being large enough, degraded through overgrazing, having reasonably uniform vegetation, and not being required for other purposes.

Ntimbale case study

The area called Ntimbale is a grazing area on the eastern side of the Vukwe river that is used mainly by people from the villages of Masingwaneng and Mambo. There has been considerable range degradation, particularly near the river. In 1979 the area was identified by the Ranch Extension Officer in Francistown as being suitable for a communal grazing cell.

A series of meetings were addressed by appropriate people working with extension, AMA's and APRU, and a strong interest in the establishment of a communal grazing cell was expressed. As this was the first group to form an AMA for grazing cell purposes there was no model constitution in existence. Gradually an acceptable one was developed and the group became registered in April 1980, 15 months after its initial response.

Meanwhile, a plan for the grazing cell was drawn up by APRU, fencing tenders called and the contract awarded. However, no money could be committed until the AMA formalities were complete and by then the validity of the tender had expired. New tenders were called for the 35 km of fences and firebreaks, and for the buildings and handling facilities. The tenders ranged from P3500 to P79000. The lowest was accepted but the contractor failed to do more than clear the firebreaks. The fencing was erected by casual labour supervised by APRU and completed in May 1981 at a cost of P12200, in addition to the P13800 paid to the contractor for the firebreaks and trace lines. The cattle kraals were similarly erected under APRU supervision, and the housing and storage built by a contractor.

Construction of the cell preceded the establishment of a water point because it was originally planned to use a sand well in the river bed to provide water. This was discounted as being too uncertain and it was decided to drill a borehole within the cell boundaries. The quotation received from a hydro-geological firm in Gaborone to conduct a water

survey was P5000. In the end a local water diviner identified two possible borehole locations, for a fee of P25. In May 1981 a drilling contractor sank a borehole at the first location and struck water at a depth of 20 metres.

The borehole was equipped with a windmill (provided under the Services to Livestock Owners in Communal Areas scheme) and a stand-by engine. The windmill was never a success and gave trouble from the beginning. There were problems with incompatibility of the windmill stroke with that of the engine, with the change-over procedure from one to the other, and with the service provided by the Department of Water Affairs. Even when the windmill was turning briskly the water output at the central reservoir was inadequate for the needs of the cattle.

During 1983, owing to the drought, the water recharge rate of the borehole dropped below that of the required extraction rate and the cattle had to be watered outside the grazing cell. In January 1984 a second water diviner, who had a good reputation and claimed to specialise in resiting boreholes not precisely located within an aquifer was called in. He said the borehole was off-centre by about 8m and marked a new spot which he was confident would provide adequate water. Tenders were called for drilling a borehole. At the same time the Department of Water Affairs embarked upon a campaign of siting and drilling community boreholes in drought affected villages, including the vicinity of Ntimbale. Agreement was reached for Water Affairs to site, drill and equip a new borehole for the grazing cell. In February 1984 they surveyed Ntimbale for water, found no evidence of water at the diviner's site but marked a probable site to the south of the cell. In April 1984 both sites were drilled. The diviner's site yielded $2m^3$ per hour after 48 hours of pumping, and the Water Affairs site $11m^3$ per hour after the same period.

The high yielding borehole was equipped with a pump and engine, new pipe was purchased, and AMA members were requested to dig the 2.7 km trench necessary for laying the pipe from the borehole to the central reservoir. Despite earlier complaints of lack of water, this simple task of connecting the new water supply was dragged out for almost a year. It was only completed after threats of disbandment of the whole grazing cell. The members were unable or unwilling to put in the small amount of effort required to dig the trench, progress was slow and intermittent, and the work was finally completed by casual labour paid out of AMA funds.

The total costs met by LDP II funds for constructing and equipping the Ntimbale communal grazing cell are shown in Table 1.

During the construction phase, protests against the Ntimbale Grazing Cell were registered by an amorphous group called 'Mambo and Maingwaneng Workers'. They claimed the cell occupied their grazing land and that they had not been duly consulted about the project. The Ranch Extension Officer, Francistown, pointed out that membership of the AMA

Table 1. Ntimbale Construction Costs

Item	*Cost/Pulas*
Firebreaks	13 760
Fencing	12 200
Drilling first borehole	5 360
Equipping first borehole	4 450
Water storage and reticulation	9 890
Handling facilities	6 220
Housing and storage	5 620
Siting and drilling two new boreholes	8 300
Engine and new reticulation	4 450
TOTAL	70 250
Budget	50 000
Overcommitment	20 250

was open to villagers of Mambo, Masingwaneng, Makaleng, Sechele and Gulubane villages and that proper consultation procedures according to the Agricultural Management Association Act of 1978 had been followed with all the communities. A meeting was called to discuss the complaints, and gradually the issue subsided.

The cell was constructed with six paddocks of 332 ha, to provide two replicates of a three-paddock rotational grazing system. Stocking commenced in March 1982 and cattle numbers were limited to 200 in the first year, owing to the poor condition of the rangeland. Castrates and

females were accepted at any age from weaning to approximately two years of age. Initially the castrates and females formed two separate herds, each grazing one replicate in a 1 month graze: 2 months rest rotation.

A manager was supplied by APRU, and the AMA committee recruited two labourers and a manager-designate. The labourers were paid P15 per month and the manager-designate P20 per month, with the intention of reviewing the latter's salary after completion of his training course.

The manager-designate attended the Ranch Management Training Centre at Ramatlabama in 1983. This course was followed by a period of field experience on one of the APRU ranches. His new salary was set by the committee at P80 per month but they found they could not afford that much and dropped it to P40 per month. The head levy at this time was P2 per quarter. Permanent transects were established and the baseline vegetation parameters recorded (APRU 1982) to enable the monitoring of vegetation change. However, the lack of progress with the development of other communal grazing cells changed the objective from a multi-site grazing systems evaluation to a comparison over time of the range condition inside and outside the Ntimbale cell. The need for replication of the grazing system within the grazing cell diminished and a single six paddock rotation was adopted with periods of 1 week grazing: 5 weeks rest.

To satisfy the breeding requirements APRU offered to supply bulls, but the group preferred the wider choice available through artificial insemination (AI). These services have been provided annually by the Artificial Insemination Group of the Ministry of Agriculture.

The AMA became registered as a producer with the Botswana Meat Commission (BMC) in order to secure its own slaughter quotas. The carcass grades have been excellent and the AMA members have been impressed. For example in 1984 (during the drought), out of forty head slaughtered, with a mean cold dressed weight of 203 kg, 2 obtained super grade, 32 grade 1, 5 grade 2 and only 1 grade 3. The average gross return was P278 per head. In subsequent years the number of animals slaughtered dropped to about twenty owing to an increased proportion of female stock in the cell. The small proportion of cattle leaving the cell that were actually sold made it very difficult to determine the financial benefits, perceived by the members, of the grazing cell.

In order to evaluate and demonstrate the superior growth rate of the cattle in the grazing cell, an attempt was made to mark and periodically weigh contemporary young stock in the participating villages. The Field Investigation Unit of APRU made a series of trips with a mobile scale to the villages for this purpose. Initially the farmers were co-operative and 194 animals were weighed in March, 1983. Subsequently interest waned and few of the marked animals came in for reweighing. Interest was temporarily restored by the incentive of spraying against ticks all the cattle

brought in for weighing, but as conditions deteriorated during the drought, cattle were moved further away from the villages for grazing and the weighing had to be abandoned.

Despite poor rains in 1981 and 1983 the cattle in the grazing cell maintained excellent condition. Members of the AMA were pleased with animal performance and visitors were impressed. Better rain in the 1984/85 season produced a marked fence line contrast of grass within the cell and almost no grass in the adjacent, more densely stocked, communal grazing area.

Perversely, animal numbers in the grazing cell declined rather than increased, the problem being the head levy. The first difficulty had been the inability of the treasurer and other committee members to maintain a balanced record of income and expenditure, despite prior training and subsequent support by the AMAO. After four years of operation it is still not possible to determine the actual operating costs or derive an appropriate head levy. The second difficulty is the tardiness of some members in paying their quarterly instalments of the head levy, with the consequence that some members' cattle have been expelled from the cell and the group has lost revenue. The third and major difficulty is that members balked at paying the head levy when it was raised by the committee from P2.00 to P4.00 per quarter in September 1985. At this time, the animal numbers in the cell dropped to 88 head.

In order to establish the head levy on a less arbitrary basis, a new set of calculations based on then current prices was made in November 1985. The costings, their derivation and the influence of animal numbers were carefully explained to the APRU manager, the AMAO and the committee. Allowing for the more realistic wages of P80 and P30 per month for the manager and labourers respectively, the head levy estimate ranged from P13 to P27 per annum for an animal complement of 300 down to 100 head.

The derivation of the head levy estimates was explained at the Annual General Meeting of the group, but the estimates were rejected. Agreement was reached to raise the head levy to P2.50 per quarter but the manager did not get his recommended salary rise from P40 to P80 per month. The manager and labourers stopped work once before because they were not being paid.

In general, the management plan has been followed reasonably well except where cash outlays are involved. There has been a definite reluctance to spend money even when it is sitting in the bank. The firebreaks have not been maintained. The APRU manager has had a constant battle trying to persuade the Committee to release funds for the purchase of mineral supplements, etc.

In agreement with the Committee, the APRU manager was withdrawn in January 1986, terminating formal responsibility of APRU for the

Ntimbale communal grazing cell. Support from the local Ranch Extension Officer and Agricultural Management Association Officer is to continue indefinitely.

LDP Progress Evaluation Report

In 1981 the implementation of the major components of the Second Livestock Development Project was so much in arrears that the World Bank conducted an in-depth assessment of selected issues related to the continued viability of the original project design (Bekure and Dyson-Hudson, 1982).

The report noted the general lack of interest in the communal grazing scheme and suggested three reasons:

1) Communities were apprehensive about allocating part of an already overcrowded communal area for the exclusive use of a few members of the community.
2) The potential beneficiaries did not see sufficient incentives to motivate their acceptance.
3) The scheme was based on the alien concept of a large number of participants entering into a long term commitment of dealing with one another co-operatively in a formal organisation.

Further observations in the report were:

- Communities were often motivated by the possibility of securing additional grazing or an additional source of water rather than by a realisation of the need to improve the management of their existing resources.
- Lack of progress may have been partly due to lack of enthusiasm for the scheme by extension staff, but it was doubtful whether even aggressive salesmanship could have generated interest in a scheme designed to solve a problem which the communities did not regard as paramount.
- Even if the scheme succeeded in rehabilitating the range within the grazing cells, there was no guarantee that the cattle coming out of the cells would be sold rather than put back on the communal rangelands.
- The design of the communal grazing cell component of the project was faulty in that it was structured to extend into communal area techniques of range rehabilitation hitherto untried and unproven in Botswana.

The report suggested that two further communal grazing cells in addition to Ntimbale would be sufficient to acquire the necessary insight into how groups of livestock owners would cope with the scheme, and recommended that the number of control cells be increased to three, one in each of the three major ecological zones.

On the basis of this report no new sites or communities were sought for communal grazing cells, but the extension effort was maintained with those groups already expressing interest. The search continued for suitable sites for two further control cells, but none was identified.

Constraints to progress

A wide range of social, organisation and economic factors have mitigated against successful implementation of the communal grazing cell scheme. The major constraints to progress have been described by Sweet and Addy (1985) and are listed below.

1. **Lack of recognition of the problem of overgrazing.** The overgrazed condition of the communal rangeland is not a sudden occurrence and is seldom considered an urgent problem if recognised at all.

2. **Unwillingness to limit stock numbers.** This is the fundamental problem which gave rise to the communal grazing cell scheme, but which cannot be solved by improved management practices alone. It is not yet recognised that grazing land is a finite resource on a village and a national basis. The 'Tragedy of the Commons' situation (Hardin, 1968) persists, wherein the incremental benefit of an extra animal accrues entirely to the owner while the incremental degradation is shared by the community.

3. **Inadequate extension support.** It was the task of the extension and AMA staff to help identify suitable communities and to lead the groups through to registration as AMA's. Only thereafter could APRU commence construction of a communal grazing cell. The necessary extension support was often lacking, partly due to staff shortages and other work commitments, but partly also due to antipathy to TGLP. Grazing cells were seen as the first step in a move towards limiting stock numbers and as such were disfavoured by many of those who were supposed to promote them.

4. **Inexperience of rural people in co-operative ventures and formal grouping.** It was difficult for villagers to formulate, understand and abide by constitutions and management plans. Despite interest shown at village meetings, progress in group formation was slow and the time interval before registration as an AMA was typically two to three years.

5. **Loss of control over own cattle.** It was a new and difficult step for many cattle owners to group their animals into a single herd over which none of them had direct control.

6. **Payment of a head levy.** Traditionally cattle are maintained rather than actively managed and the costs of ownership are mostly hidden ones. Thus a regular cash outlay to a third party was a particularly difficult concept to rationalise. Implicit in the justification of expenditure on improved production is a degree of commercialisation, but where the objective of cattle ownership is accumulation rather than turnover, a monetary return on investment is not realised and the proposition is unattractive. The objectives of range restoration and improved cattle performance were insufficient incentives to stimulate the payment of the head levies necessary to operate a communal grazing cell.

7. **Reluctance to use AMA funds.** Apart from reluctance to pay adequate head levies, there was also considerable reticence to spend the funds accrued. This was part of the syndrome of not being accustomed to spending money on cattle maintenance.

8. **Insufficient literacy and numeracy of committee members.** In the rural sector the main cattle owners tend to be older members of the community: many have had little education. The younger, better educated people normally have employment and are seldom resident in the villages, and hence are unavailable to hold committee positions. In the case of Ntimbale, the only communal cell to become operational, the inability of the treasurer to do simple arithmetic has been a severe impediment to balanced book-keeping.

9. **Exclusive allocation of grazing to an AMA.** In some communities there has been reluctance to allow one group exclusive use of part of the commonage and to fence it off.

10. **Too much too soon.** The communal grazing cell scheme introduced too many new and alien concepts to be absorbed simultaneously. It is doubtful whether many AMA members really understood the managerial and financial implications of participating in a communal grazing cell.

11. **Lack of identification with the grazing cell once established.** Groups were actively encouraged to accept and adopt the communal grazing cell with a minimum of alteration and, as the members had little involvement with the construction and made no contribution to the costs, there was little feeling of ownership of the product.

12. **Loss of condition of cattle coming out of the cell.** At Ntimbale a contributory factor to the reluctance of members to pay for participation was the realisation that the cattle lost condition when returning to the communal area. Fat cattle have more to lose than lean

cattle and hence members saw a more pronounced loss of condition on cattle freshly out of the cell than on their contemporaries during the dry season.

Conclusions

From the experience gained during six years of attempting to establish and operate communal grazing cells, a number of conclusions can be drawn in relation to co-operative action and development project approaches and in the communal areas of Botswana.

1. The communal grazing cell scheme was badly designed. It introduced too many alien concepts simultaneously, took insufficient cognisance of traditional attitudes to cattle ownership, and did not secure active participation by the members.

2. Group action to overcome a problem perceived by outsiders can only be expected if that problem is also recognised and considered important by the community.

3. Ideas may be introduced but the actual initiative for change should come from the people. There are no solutions that can be directly imposed and successfully enforced by government. Ultimately management has to become an institutional force of the community itself.

4. The issues of grazing control and stock limitation can probably be successfully tackled only when the problems more readily perceived by the communities have been addressed and overcome.

5. Boundary recognition is an essential pre-requisite to voluntary stock control, and is more easily established for cohesive groups.

6. The procedures for group formation should be simplified and the AMAOs should provide more assistance in the maintenance of financial records.

7. Key officials of AMAs and similar groups must be sufficiently literate and numerate for maintenance of essential records under the supervision of an AMAO

8. If progress in range and stock management is to be made in the traditional sector, all cattle keeping must carry a realistic cost. At present only those animals slaughtered through BMC are taxed and the cattle industry is heavily subsidised. The consequences are that

a) there is little incentive to get rid of unproductive or surplus animals, and b) the costs of improved management are seen by the non-commercial cattle owners as too big a step up from zero cost. If there were a realistic basic cost, the incremental cost of improved management would be a smaller step and might be more acceptable.

9. Development programmes should work through local institutional frameworks where possible, in spaced logical steps, and with realistic time scales. Relatively short time frames imposed by funding agencies demand a sense of urgency seldom felt by the recipients, and carry the risk of acceptance without commitment.

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3

Fodder Bank Testing Among Fulani Agropastoralists in Central Nigeria: Feeding Decisions in the Use of Improved Forages[1]

Ellen Taylor-Powell

Introduction

The value of producer participation in technology development is increasingly evident. The appropriateness of technologies as perceived by local producers determines their motivation to accept change (Hildebrand, 1980-81). Their own evaluation criteria are the critical determinants of technology success (Rhoades and Booth, 1982; Lightfoot, 1984; Tripp, 1985). This paper presents findings gathered during a formative evaluation of producer reactions to on-farm trials conducted by the Subhumid Zone Program (SHZP) of the International Livestock Centre for Africa (ILCA). Documentation of Fulani behaviour as they invested their own resources in the forage improvement provided valuable information for modifying research recommendations to be congruent with producer objectives and circumstances.

The SHZP began operations in 1978 in the central region of the Subhumid Zone (SHZ) of Nigeria: a zone delimited by the isolines of 180-27 crop growing days. The programme incorporated the central characteristics of Farming Systems Research (FSR): a wholistic orientation involving both technical and human elements; a multidisciplinary team of scientists conducting on-farm research; the participation of local producers throughout the process of technology generation. Settled Fulani cattle keepers were the programme's target group given the trend among the Fulani to establish permanent residences within the SHZ. Poor cattle

[1] This chapter is based on research conducted from 1982-1984 when the author worked as a socioeconomist with the Subhumid Zone Programme of the International Livestock Centre for Africa and was originally published in August 1987 as ODI Pastoral Development Network Paper 24b.

nutrition, particularly in the dry season, was the principal factor limiting livestock productivity.

To increase livestock production and thereby improve human welfare, forage improvements were needed. Forage was available in the SHZ but was low in quality. For five months of the year cattle obtained insufficient protein to meet maintenance requirements and cattle liveweight fell by 15% during the dry season (ILCA, 1982). The SHZP set about developing appropriate forage production techniques based upon the Fulani situation: insecure land rights, no mechanical expertise including experience with draught power (Mohamed-Saleem and Kaufmann, 1983).

The Fodder Bank Technology

Of the forage improvements tested with the Fulani by the SHZP, the fodder bank technology offers the most promise for improving cattle nutrition across the SHZ. The fodder bank is a fenced area predominated by a forage legume (*Stylosanthes* species) which the producer can establish and maintain as a supplement to natural grazing. The standard size of 4 ha is adapted depending upon land availability, producer's resources and intended use. Cattle conduct the major establishment tasks: they prepared the seedbed through intensive grazing before seeding or trampling during night-time confinement[2]; and they control the competing grass growth during the early wet season through their selective grazing behaviour.

Credit to finance the costs (Table 1) of fodder bank implementation is available through the National Livestock Projects Department (NLPD). This agency also provides extension advice and assistance for fence erection and management tasks. Activities in the establishment and management of fodder banks include (1) fencing the area; (2) preparing the seedbed, including necessary land clearing; (3) firebreak establishment; (4) scarifying and broadcasting seeds mixed with superphosphate fertilizer; (5) controlling early season grass growth through managed grazing; (6) deferring grazing until the dry season and (7) selective use of the fodder bank during the dry season. The fodder bank needs to be productive for 5 years to be financially viable so the legume must be managed to regenerate. As of 1986, there were 86 fodder banks established in the SHZ of Nigeria with outreach beginning in neighbouring countries. For details of the establishment and productivity of fodder banks see Mahomed-Saleem (1986).

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[2] Traditionally, cattle are confined at night close to the homestead, tied in pairs at the ankle or enclosed in a brush or lightly strung wire corral. This protects the herd from predators and thieves. In this manner, cattle fertilize cropland with differing systems of confinement for the wet and dry season manuring. For discussion, see Powell and Taylor-Powell (1984); Powell and Waters-Bayer (1985).

Table 1. Establishment and maintenance costs of a 4 ha fodder bank in 1984

Establishment costs

Item		*Cost (in $US)*
Metal fencing, including labour		2220 40
Seed (40 kg)		624 00
Fertilizer (600 kg)		163 80
TOTAL		$US 3008 20

Maintenance costs

Fencing	@ 10% replacement	222 30
Seed	@ 10% reseeding	62 40
Fertilizer	400 kg	109 20
Labour	9 days	58 50
TOTAL		$US 452 40

Source: NLPD Records, 1985

The Fodder Bank Testers

Until 1984, the SHZP research work was concentrated in two case study areas near Kaduna (Figure 1). Yearly rainfall is about 1,200 mm falling between May and October. With a 180 day growing season, principal crops in the region include sorghum, maize, millet, yams, and groundnuts. Kurmin Biri is within a government grazing reserve. Fulani have resettled within the reserve boundaries from neighbouring areas to secure land rights where they can settle permanently without being disturbed by farmers. Though established in 1970, the reserve has not been formally gazetted. The indigenous farmers cause some concern, so Fulani expectations of legal land rights have been largely unrealised. As of 1984, only 32 Fulani households were settled year-round inside the 31,000 ha reserve. Cultivation density is estimated below 5%.

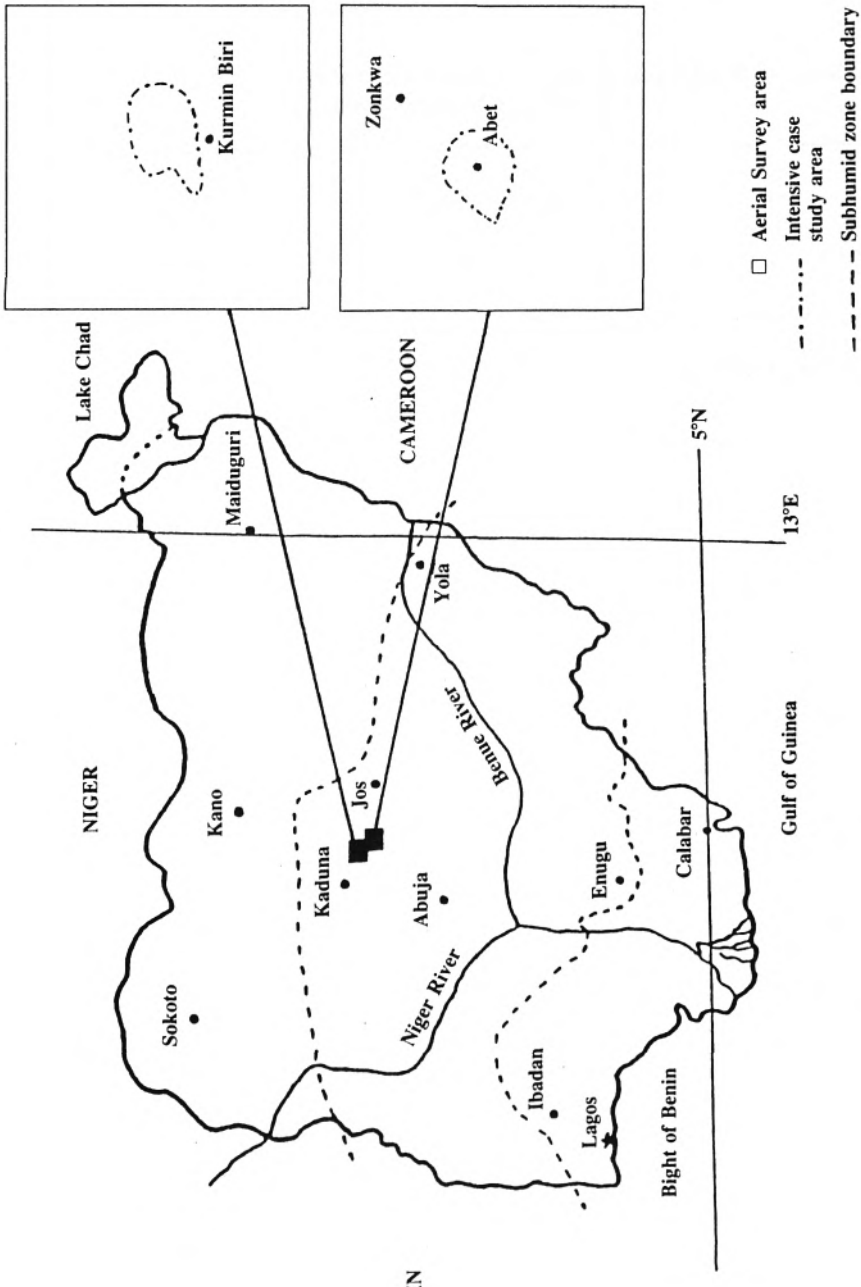

Figure 1. Map of Case Study Areas in the Subhumid Zone of Nigeria

Abet, in contrast, is an area where Fulani have settled spontaneously amid crop farmers, the more common settlement pattern in the Zone. In Abet, Fulani negotiate with local farmers or authorities for land on which to settle and cultivate. Population density is much higher, at about 70 people/km^2 and about 25% of the land is cultivated. Constituting about 10% of the population, some Fulani families have lived in Abet year-round for four generations (Waters-Bayer and Bayer, 1984). In 1982, Kachia, contiguous to Kurmin Biri, became a location for fodder bank establishment. This is an area where Fulani have purchased occupancy rights through the District Head. Such transactions give Fulani the right to trade and inherit land, making land improvement investments more attractive. Information on the socioeconomic background of the Fulani fodder bank testers in the three sites during 1984 is seen in Table 2. The average herd size is 60 head of cattle. This compares to average herd sizes of 55 in the dry season and 68 head in the wet season according to aerial surveys of the Zone as a whole (Bourn and Milligan, 1983); and an average herd size of 48 in Kurmin Biri and 35 in Abet from the SHZP survey of 29 herds (Mani et al, 1986).

All the fodder bank testers were Kachichere Fulani, having migrated westward from the Kachichere settlement area on the edge of the Jos Plateau (Waters-Bayer, 1983). They are considered settled Fulani though they may move their homesteads within a limited distance periodically. Cattle are normally herded within a few kilometres of the homestead though herds or parts of herds may be transferred at various times of the year to distribute stocking pressure and to exploit seasonal grazing resources. Herd management and intrahousehold decision-making of these settled Fulani have been described by Waters-Bayer (1985).

While cattle husbandry is the principal occupation, most of these Fulani also do some cropping. The principal reason for cropping is to reduce expenditures for grain so that animals do not have to be sold to buy staple grains (sorghum, millet, and maize). Land availability and labour shortages are the limiting factors to the size of the cultivated area. The Fulani cropping system is less diversified with less intercropping than that of the neighbouring crop farmers (Powell and Taylor-Powell, 1984). Forage production at the expense of food production is an unattractive alternative.

Feeding Decisions in the Use of Improved Forages

Research estimates indicated that a 4 ha fodder bank with an average legume yield of 5,000 kg/ha would be sufficient to supplement 15-20 productive cows (in-calf and lactating females) in the average sized herd during the 6 month dry season (Milligan and Kaufmann, 1979). Grazing for 2-3 hours per day would provide supplementary protein during the critical period of the dry season to the class of stock which would respond most profitably, that is, lactating and pregnant cows. The expected

Table 2. Socioeconomic characteristics of the fodder bank testers (n = 18 Fulani)

Characterstic	*Average*	*Range*	*Responses*
Herd size (a)			
No of cattle/hshold	60	30 - 124	
No of sheep/hshold	9	0 - 31	
Farm size (ha/hshold) (b)	1.1	.23 - 2.19	
Household size (a)	14	8 - 22	
Active males/hshold (a,c)	5	2 - 8	
Age of hshold head	48	28 - 75	
Off-farm income			
Yes			9
No			9
Literacy (hshold head)			
Arabic			4
Hausa + Arabic			4
Hausa + English			1
Hausa + Arabic + English			1
None			8

(a) n = 17; excludes 1 household with 700 head of cattle and 30 in the household because atypical of sample.
(b) n = 10 farms measured; all these Fulani farms except 1; 2 others practice farming very minimally.
(c) Active males above six years old indicate potential labour for herding, farming and cattle management; actually they may be involved in schooling or off-farm employment.

response was increased milk production (offtake and calf consumption), improved calf survival and growth rate, which were congruent with Fulani production objectives. Fulani participated in selecting which animals should graze the fodder bank and were given the option of either morning or evening grazing periods.

Observations of Fulani management in their use of the fodder banks revealed that they were not following the recommendations, particularly in terms of restricting grazing to the selected animals. In order to understand these deviations, the 11 fodder banks for which a grazing recommendation had been made in 1984, were closely monitored to identify which animals

were actually using the fodder banks. Follow-up, informal interviewing, surveys, information from other data pools, and observations were combined to understand Fulani reasons for their decisions in the use of the forage.

All of the 11 Fulani included more animals than had been selected. For seven Fulani (64%), whole herds were given access to the fodder banks: either the total management unit ranging from 30-120 animals (3 cases) or that part of the herd which remained at the homestead when the other animals were transferred elsewhere (4 cases with a range of 16-61 animals). If sheep were normally herded with the cattle in the dry season, then the sheep were also found in the fodder banks. Typically, Fulani in the area keep sheep in the ratio of 1 sheep to 4 head of cattle (Bayer, 1982).

Only four of the 11 Fulani restricted the number of animals grazing the fodder bank. But even they included more than the recommended number. And as the dry season progressed, they included still others, particularly weak animals. By within 2-6 weeks after fodder bank grazing had commenced, they had included their whole herd. Their choice of animals and reasons were as follows: lactating cows in poor condition with declining milk supplies because the welfare of the calf was in danger (4 responses); dry cows and heifers to induce cycling (2 responses); pregnant cows to produce strong calves (1 response).

In evaluating a related dry season feed supplementation package, the Small Holder Dairy Scheme, it was also found that the Fulani (n=14) did not ration cotton seed cake to the selected lactating and heavily pregnant cows (Taylor-Powell and Suleiman, 1986). Rather, they gave priority to lactating cows in poor condition who had insufficient milk for their calves. They increased animal numbers as the dry season progressed with any animal thought to be weak. This often meant that whole herds were given access to the feed supplement or that part of the herd which remained at the homestead when animals were transferred elsewhere in the dry season.

Responses from 24 Fulani indicate the animals considered to be most in need of supplementation in the dry season (Table 3). Several Fulani mentioned calves of age 5 months to one year as being under particular stress in the dry season. Actual Fulani behaviour showed that if a given feed resource is limited in availability and/or costly, such as cotton seed cake, then priority might be given to lactating cows in poor condition to ensure calf survival. But as the dry season progressed, other animals would be given access to the feedstuff. As animal condition changed over the course of the dry season with the decline in forage resources, so did Fulani choices in the use of feed supplements.

The Fulani in this area have the custom of using various feed supplements in the dry season including *kanwa* (local mineral supplement traditionally fed to cattle), salt, wheat bran, chaff (usually of sorghum), and

Table 3. Cattle most in need of supplementation in the dry season (n = 24 Fulani respondants)

Category	*No of responses*	*Reason*
Old lactating cows	15	Animals weak with insufficient milk for calves; calves weak
Any lactating cow in poor condition	5	Insufficient milk for calf so calf under stress
Any weak and/or sick animal	3	Might not withstand the dry season
All animals	1	All animals decline in the dry season

selected low-lying *fadama* grasses which are cut and carried to the homestead. Bran and chaff may be obtained from wives, from farmers in payment for manuring their cropland, or bran may be purchased (1983 price of US$ 0.15/kg). Some Fulani have been observed feeding sorghum grain but only in cases where grain was plentiful and only for survival feeding. Except for *kanwa*, salt and cut branches, the other locally available feedstuffs are generally fed to animals too weak to follow the herd during normal grazing. Feeding trials using agro-industrial supplements were initiated by the SHZP in 1979. Since then, a farm service centre at Kurmin Biri has operated dry season feeding schemes which allow interested cattle keepers to purchase feed supplements on credit. Supplies of groundnut cake and cotton seed cake can be found in town markets. Table 4 shows the types of feed supplement used by local Fulani not registered in a government scheme.

Fulani related low cattle productivity in the dry season to both the poor quality and quantity of the grazing resources. Production levels (referred to in terms of milk supply, cow fertility, general animal conditions and weight) were said to be high in the early wet season during June-July and also during the early crop residue grazing in December and January. Production declined from September to December when the grasses had matured and again from February until the rains arrived. Productivity reached its lowest point in the late dry season, March-April.

Table 4. Use of locally available feed supplements (n = 38 Fulani)

Feedstuff	*Number of Fulani using feedstuff*	*% of total*
Kanwa	38	100
Cut branches	23	61
Salt block	11	29
Cut grasses	9	24
Chaff	7	18
Bran	5	13
Salt (granular)	2	5

This depiction of a bimodal pattern with peaks in the wet season and the early dry season agreed with the SHZP survey data collected from traditionally managed Bunaji herds (Otchere, 1986).

Interviews with a random sample of 38 Fulani indicated that, on average, half the herds in Kurmin Biri and two-thirds of those in Abet lost cattle in the dry season (Table 5). This situation had not been indicated during the pre-research state of knowledge reviews. The loss per herd is more than one animal higher in the grazing reserve than in the farming area. Fulani distinguished between diseased animals and animal losses that resulted from the dry season conditions due to weakness.

As the quantity and quality of the range resources declined over the dry season, and all animals were seen to be losing condition, even a limited feed resource - the fodder bank - was made available to all animals. To the Fulani, this meant a greater chance of being able to sell an animal when desired, that is, when in good condition, when the sale price was high, when cash was needed, rather than when demanded by external events such as an emergency sale in the late dry season at which time the animal was emaciated and market prices were low. Whether to ensure the viability of the herd or to obtain a maximum sale price, the return in not having to cull an emaciated animal in March-April was visible and immediate. The difference between the sale of an animal in normal condition and one in distressed condition was on average about US$ 384.00 (SHZP survey data). From the Fulani perspective, the profitability of the fodder bank was in maintaining animal condition and herd numbers.

Fulani behaviour in the use of the forage is consistent with the multiple objective nature of this Fulani cattle keeping system. Female animals are the most valued asset because of the calves and milk that they produce.

Table 5. Cattle losses in the dry season in Kurmin Biri and Abet during 1982/83 and 1983/84

	1982/83		*1983/84*	
	*Kurmin Biri (n=13)**	*Abet (n=25)*	*Kurmin Biri (n=13)*	*Abet (n=25)*
No of herds which lost cattle	6	18	8	16
% of herds which lost cattle	46	72	62	64
Total number of cattle lost	24	63	40	45
Average/herd which lost cattle	4	3.5	5	2.8

* n = herd managers surveyed

But all animals are considered productive and have a purpose, whether it is the milk for the calf, for the family, for the wives to sell; whether the animals represent capital that can be used to purchase grain, consumer goods, pay childrens' schooling fees; and/or whether the animals represent the means to meet social and cultural obligations. In the absence of other investment opportunities, animals that can be accumulated beyond the perceived needs of the household serve as an investment, an insurance against times of adversity. Cattle also bring prestige and the means to help others. This in turn builds personal constituencies. Cattle keeping is both an economic activity and a way of life (van Raay, 1975; Rieseman, 1980).

Also, ownership patterns affected decision-making in the use of the forage and tended to ensure egalitarian treatment of cattle. The household head was the central manager and was responsible for the day-to-day welfare of the herd. Individual cattle, however, might be owned by a wife (wives), children, relatives or entrusted by non-kin owners. Major management decisions were not made in isolation nor by one individual. Weak or sick animals received special treatment regardless of ownership. For the rest of the herd, multiple ownership implied multiple decision makers. This added complexity to the management of the forage as well as the tendency to treat all animals as equally as possible. In the words of one Fulani, "As the *ruga* head, all the cattle are under my authority.

I have to treat them all fairly whether they belong to a wife, child or someone else. For example, maybe I have five children and only one mango - I would not give that one mango to just one child but would cut it and divide it among all the children. I must manage with what I have to see that all receive their share".

Besides the production objectives and ownership characteristics, numerous interacting factors influenced Fulani decisions concerning the use of the improved forage. These are briefly discussed below.

1. Dry season conditions. Fulani decision-making in the use of the fodder banks was affected by such changing and interacting factors as wind and sun intensities; length and severity of the dry season; cattle densities and their effect on water and grazing resources; availability of alternative dry season feed resources (eg. crop residues, *fadama* grazing); timeliness, abundance and distribution of the early rains.

Although the centre areas of Abet and Kurmin Biri were only 40 km apart, significant locational differences existed between the two areas that affected dry season grazing possibilities. This resulted in different management of the introduced forage technology. Kurmin Biri was said to have a more severe dry season: the dry season was longer; there were less crop residues to graze given the low farming population; low lying areas were fewer so the better quality and prolonged availability of *fadama* grazing resources were limited; riverine sites were inaccessible for grazing due to dry season farming enterprises by the indigenous crop farmers; the natural grasses were considered to be of a different type and of lower quality than in more densely cultivated areas; the vast expanse of bush meant a greater threat of fire depleting the bulk of the dry season grasses. Two of the Kurmin Biri testers initiated night grazing in their fodder banks in mid-March - a development of some import because these Fulani do not habitually leave their animals untethered and untended at night. Likewise, the Fulani in Kurmin Biri continued to use their overgrazed fodder banks through April allowing cattle to lick up the little remaining debris. Early rains in Abet, in contrast, brought new green grass growth. Fulani discontinued using their fodder banks and sent their herds to graze the wider area.

2. Herd transfers. Herd splitting and transfers of cattle during the dry season determined the type and number of cattle using the fodder bank. For Fulani who split their herds in the dry season (dependant upon labour sharing agreements or the availability of household labour to move and manage herds in separate locations), those animals remaining at the homestead could be given preferential treatment. Usually a small lactating herd was left at the homestead along with castrates and young bulls. The majority of the cows were sent elsewhere to exploit better quality grazing.

Four types of animal transfers were recorded:
- *dry season transfers* when the herd was usually split and part moved to another area for the entire dry season to distribute grazing pressure and/or take advantage of better quality feed resources;
- *crop residue transfers* when herds were moved away from the homestead to nearby farming areas to exploit crop residue resources, generally lasting for the first 2-3 weeks of the crop residue grazing period;
- *transfers for manuring contracts* when herds were relocated to spend their nights on farmers' fields in order to leave manure there for which the Fulani was paid; these transfers occurred at various times and were of various durations throughout the dry season;
- *early rain transfers* when herds were moved to adjacent districts to graze the new grass growth; 'follow the rain' transfers began in March and were of varying duration dependent upon stocking pressure and rainfall pattern.

3. Labour availability. Grazing management and selective feeding decisions were influenced by the availability and competence of the labour supply. Separating animals and managing two groups of cattle, one in the fodder bank and the other grazing elsewhere, required additional labour inputs. Young children often did the herding in the dry season but they might be unwilling or unable to separate and control two groups of animals. If a more skilled herder was absent (not unlikely given off-farm employment, travel, time spent at markets, etc.) then selective feeding did not occur.

All of the Fulani used the morning hours for grazing the fodder banks. Not only was it easier to separate the animals at the time of milking, done exclusively in the morning, but morning grazing fitted into the traditional grazing practices in the dry season. During this time of year, the limited feed resources meant that grazing began early in the morning, generally by 7am as opposed to 10-11am in the wet season. The long grazing day was divided between two herders. Grazing of the fodder bank coincided with the early morning period of grazing which was usually done around the homestead to take advantage of crop residues and available forages at least until these resources were depleted. The tendency during the early dry season was for all animals to move into the fodder bank, especially if the fence was insecure. In some cases, the fodder bank was used as a holding pen for the whole herd until the daytime herder was ready.

4. Forage quantity and quality. Based on an extensive indigenous technical knowledge regarding legumes and grasses and their differing effect on animal condition, the Fulani evaluated the quality and quantity of forage inside and outside the fodder bank and made feeding decisions

accordingly. Most of the Fulani did not use their fodder banks daily. As the season progressed and the grazing possibilities changed, so did their use of the fodder bank.

The benefit the fence provided was evident in Fulani discussions. The fence did not secure land as some critics ventured was the Fulani intent in having a fodder bank. Rather the fence protected the area for the use of one herd. Because the fence protected the area from communal grazing, the fodder bank could be reserved until later in the dry season when little other forage was available, the sun was the hottest, and animals were under the greatest stress. Thus, the general consensus was that because the fodder bank was not large and could not feed their herds throughout the entire dry season, it was best to save this resource until February-March. Once the crop residues and natural range had declined in quantity and quality, then the fodder banks could be used to provide a relatively steady feed resource especially during the latter part of the dry season.

The fodder bank technology was conceived by the SHZP as a ration to supplement natural grazing. In effect, the Fulani adaptations to the research recommendations resulted in an alternative form of rationing. Although the Fulani did not restrict the use of the improved forage to the productive females as envisioned, they did restrict the frequency of use. They fitted the fodder bank into their traditional dry season grazing management strategies which utilize a variety of forage and browse species (Bayer, 1986). It provided cattle with an additional grazing resource and diet supplement during a most critical period. By using the fodder bank to save nutritionally stressed animals, it is estimated that fodder bank owners can save at least two forced sales worth US$ 767.00 annually so that the total costs of fodder bank development can be redeemed in four years (Kaufman, unpublished data). The Fulani adaptations to the fodder bank technology have indicated new lines of research in terms of alternative feeding strategies of improved forages and the most economical periods of use.

Conclusions

Feeding decisions in the use of improved forages by Fulani agropastoralists were complex, multifaceted, and fluid. These complexities included such factors as production objectives, cattle ownership patterns, locational and climatic variables, dry season herding practices, labour availability, and estimates of forage availability and quality. There were no set, predetermined decisions of when the forage would be used or by which animals. Rather Fulani changed the frequency of use and the animals grazing the fodder bank as the dry season evolved, based on changing circumstances, subjective appraisals of grazing resources, and animal condition. The feeding strategy was largely one of maintenance feeding

where all cattle are viewed as being equally important. The aim was to minimize losses and to maintain herd numbers.

Fulani evaluated and adapted the fodder bank to meet their own production objectives, circumstances, and environmental conditions. Monitoring Fulani behaviour during their use of the technology and seeking the production logic behind their behaviour signalled ways to improve the forage production and utilization recommendations. Such informal research by local producers and allowing such experimentation to influence agricultural decision-making are critical to the successful design and transfer of technology.

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4

Oxfam's Kenya Restocking Projects[1]

Jon R. Moris

Why restocking?

The four projects described in this paper were all aimed at 'restocking' destitute pastoralists in the very dry areas of northern Kenya (in Wajir, Isiolo, Samburu and Turkana districts). The approach adopted was to supply each recipient household with a nucleus herd of smallstock (mostly female goats) sufficient, it was hoped, for each family's continued livelihood. To ensure donated animals would not be sold or eaten immediately, recipients continued to receive food rations for varying periods of up to one year. Usually the recipients in a given community were restocked at roughly the same time when the programme was active in their area. The two larger projects, in Turkana and Samburu, dealt in sequence with nine or ten different communities[2]. In these cases a central office was established and a team of monitors employed for a year or more. The giving out of a substantial number of smallstock (30-70) animals to several families at once can be contrasted to the alternative of giving only a few animals to each family in sequence spread out over an extended period. The former policy was adopted for herd reconstitution in Kenya because there were many destitute families eager to resume a pastoral way of life, and because it allows families to move away from a restocking centre as rapidly as possible.

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[1] This chapter, originally presented as a paper at Oxfam's Arid Lands Management Workshop (Cotonou, Benin 23-27 March 1987), is based on field visits undertaken in January 1987. It was published in September 1988 as ODI Pastoral Development Network Paper 26c. The opinions expressed are, however, entirely the author's own and may differ at some points with how these projects are viewed by Oxfam, Kenya.

[2] When visited (January 1987), Oxfam's Samburu project was nearing the end of its first phase. It has since been revived under Kenyan leadership and is said to be quite successful. A complete field evaluation including these second phase activities is currently underway (mid-1988) through Oxfam's Kenya office.

The case for supporting restocking when large numbers of pastoralists have become destitute rests upon several arguments.[3] First, scientists now realize that the productivity of indigenous systems for livestock keeping while low is at least as good as that of alternative options for use of the same resources. For a long time this fact was obscured because comparisons were done on a per animal basis. Now that measurements are available instead on the total biomass sustained per hectare, it is clear that indigenous technologies were (and are) relatively efficient - giving, for example, a higher output per hectare than uses of comparable drylands in Australia or western United States.

Second, in East Africa when dry lands are left unused they revert to dense bush thicket (a trend observable in under-utilized parts of Turkana and Pakot subject to armed raiding). This represents a net loss of productive resources available to support people and their herds.

Third, much of the conventional wisdom about 'overstocked' dry lands has been derived from *grasslands*. The dry areas of Kenya are instead *bushlands* where indigenous browse species are fed by surface drainage - a widespread example of natural 'water harvesting'. Goats and camels make a relatively efficient use of such resources, even though the land appears 'overgrazed' to the grassland ecologist. Relevant bushland management regimes are just now being worked out.

Fourth, at times of drought the absence of efficient livestock and food marketing institutions in Africa's marginal lands leads to 'asset stripping', the loss by pastoralists of large investments at salvage prices. Since this loss is often unrelated to pastoralists' managerial skills, being instead a general consequence of strongly adverse terms of trade during a drought, the sooner families can be re-equipped to enter the pastoral system the better. A major objective of large-scale restocking would be to avoid the loss of productive skills and attitudes which can occur when people remain totally dependent upon outside aid for an extended period (Moris 1988).

Who does it?

Even granted that there may be a need for restocking after a major drought, there remains the issue of who should do it. An obvious criticism is that these pastoral systems might have restocked their own members gradually through existing arrangements. All the social systems dealt with by Oxfam's Kenya restocking projects have indigenous mechanisms for assisting destitute families. This makes it a valid question why external intervention was needed at all.

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[3] For Oxfam, the restocking concept originated in Brian Hartley's earlier experience of the Ethiopian drought in the mid-1970s. The case for restocking has been put by Richard Hogg for Isiolo and Turkana, by White for Niger, and by Swift and Maliki, also for Niger (see reference listed at the end of this paper).

One answer would be that the mere existence of such mechanisms does not guarantee they are widely employed. As Richard Hogg pointed out when justifying Oxfam's initial pilot project, there were Boran in Isiolo with more than a thousand head of stock who had not re-equipped friends and relatives in dire need. It seems that a severe drought may corrode earlier traditions of reciprocity and sharing; it can also strip nearly everyone of animals so that there is insufficient breeding herd to permit effective restocking. Furthermore, Kenya's pastoral societies are experiencing increased individualization associated with commercialisation. Even though elders remember traditional arrangements for sharing stock, they admit that these customs are being abandoned in the most drought-affected communities (if not universally). Traditional restocking mechanisms seemed to work more effectively for isolated instances of stock loss (from disease or raiding) than for district-wide disasters.

A second important reservation is that even when operative, restocking arrangements were *not* generally available to everyone in need. Among these societies (as among the Maasai to the south), it was not common for herdowners to share out animals to be tended elsewhere by poorer families - a hedge against localized disaster seen in some other African societies. Instead, families with surplus labour shared their children by sending them to live with those who had animals surplus to their immediate consumption needs.

In addition, the opportunity to restock arises when a man has friends or relatives with substantial herds or when a family has marriageable daughters and sufficient social standing to insure that bridewealth is paid when they are married. Neither mechanism is of much use to those in small, poor families who in any event may be forced to sell or consume any animals they might receive. Older women who have been abandoned or widowed and who have several dependents find themselves stranded, without the social ties necessary for activating stock exchanges. The fact that outsiders can target restocking assistance to those who do not qualify within their own entitlement systems is an important justification for external intervention (though not yet fully acknowledged in the selection of stock recipients).

However, should Oxfam undertake such projects directly as it did in these four cases? The NGOs active in northern Kenya were mostly religious organisations. Their own, small-scale restocking efforts appeared to have a close link to the sponsor's proselytizing activities. This appears to have been a principal reason for Oxfam's reluctance to play its traditional role as simply an enabling organisation working in partnership with a local NGO which would carry out the programme. A further reason was that restocking was a novel and as yet unproven concept in East Africa. Proponents of Oxfam's involvement saw it as a pilot venture,

designed to develop an operational approach which might then be replicated much more widely in response to future droughts.

Strong as these arguments seem, they neglect a crucial aspect of all restocking projects: the fairly large amounts of money or food which the sponsoring agency must handle routinely during the restocking exercise. For example, a single payment to one transporter working under Oxfam commission on one of its *smaller* projects was for 116,400 K shs. The sheer volume of animals to be purchased or food distributed constitutes a perpetual temptation for local employees who are not highly paid but whose job makes them responsible for disbursement; it can become an equal temptation if a local committee is given this function. Anywhere in the world, disbursement of food relief can become a corrupting influence, but the pressures in this direction are particularly strong within remote locations of northern Kenya. In the event, Oxfam minimized this problem by relying largely upon expatriate consultants to lead each field team[4], and by leaving other organisations (such as TRP in Turkana) to organise the storage and transport of food rations in its larger projects. These tactics appear to have been effective, but they must be recognised in any assessment of the general replicability of the restocking model.

Project organisation

When Oxfam does decide to implement a project itself, it becomes responsible for a range of organisational matters beyond those otherwise encountered. These are summarised in Table 1 overleaf, and include:

a. numbers and composition of animals supplied;
b. selection of recipients;
c. buying arrangements;
d. conditions at transfer;
e. rations and equipment;
f. grouping of recipients;
g. monitoring;
h. technical support;
i. timing.

a. *Numbers & Type of Animals Supplied*

Determining the number, age, sex and species of animals to be given out is critical to project success. Smallstock are preferable to large stock because of their faster reproduction rate and the lessened degree of risk in holding many small animals vs. a few large ones. In the northern Kenya environment, goats are preferable to sheep, females to males, and camels to cattle. The numbers given out varied in Isiolo. For a household to

[4] Up to early 1987 in Wajir and the second phase of Samburu, Kenyan staff have taken the lead.

Table 1. Comparison of Oxfam's Kenya restocking projects

District	*ISIOLO*	*WAJIR*	*SAMBURU**	*TURKANA***
Location	Around Malka Daka Scheme	Around Wajir town	Locations near Baragoi	Various sites in District
Period of restocking	Sept-Nov 1983	Nov 1984/ Dec 1985	Feb 1985 to Dec 1986	May-Sept 1984 (pilot scheme) Jan 1985-Dec 1986
Number of animals per family	50 shoats (8 goats & 42 sheep)	30 goats	50-70 shoats depending on community	50-70 shoats (mostly goats)
Transport animal(s)	1-2 donkeys each	1 donkey or camel	1 donkey or 2 camels	1 donkey each or promised
Number of families restocked	70	30 in two stages (20 + 10)	?	381 to date
Selection of recommendation recipients coordinators	By Oxfam consultant	By NGO person or DC & chiefs	By Oxfam staff on recommendation of chiefs & committees	By Oxfam staff on recommendation of TRP & chiefs
Buying arrangements	Oxfam consultant from traders	Oxfam local staff	?	Temporary buying centres also from traders
Terms	Gift with strings	Gift with many strings	Loan	Part loan
Monitoring arrangements	3 local monitors	1 local monitor	2 staff + 9 monitors	3 staff + 10 monitors
Leadership	External consultant (3 months)	Oxfam Kenya staff	External consultant (9 months?) then Oxfam Kenya staff	External consultants & local staff

* Figures on the Samburu project were not available in Kenya because the project files had been stolen.

** A complete description of the Turkana project's operational details is available in Burke (1987).

survive on only its livestock it needs from 70 to 100 or more smallstock, depending on family size. Giving out less than this to each family implies that they will receive rations to tide them over for an extended period and that most of their animals will be females of a suitable age when purchased. The Isiolo pilot project was probably mistaken in giving out

mostly sheep rather than goats - an understandable reaction to the scarcity of goats in the local marketplaces. Availability of sale stock for purchase by a restocking project emerges as a major problem, particularly if the objective is to buy in the immediate area (to minimize disease risks and to stay within pre-existing stocking rates). Also, the purchase of female animals may reduce the viability of the seller's holdings. Transport animals provided to each recipient were generally one or two donkeys: any delay in this arrangement (as happened in Turkana) limits families' mobility; it would have been preferable to issue female donkeys in all instances. The unresolved question (because not yet tried) is whether in a dry environment camels might have served as the transport animal.

b. *Selection of recipients*
How to screen applicants quickly and fairly remains a major difficulty in restocking projects (as it does in any form of food relief). The Wajir and Isiolo cases relied upon expatriates with several years' prior acquaintance with the immediate area. Turkana was perhaps the most problematic, with accusations that some of those restocked were not genuinely destitute. It should be noted, however, that long-term, completely destitute families make poor candidates for restocking, having lost the necessary managerial skills. Samburu employed advice from local restocking committees, a well-received innovation but one facilitated by the presence of the project team at an organisational base for over a full year. Also, it was apparent in the field interviews that the administrative Chiefs and sub-Chiefs tended to dominate in the affairs of these committees.

c. *Buying arrangements*
The original intention was to buy smallstock in the very communities being assisted. This would minimize disease risks and leave overall stocking rates unchanged; it also buttresses the terms of trade for other pastoralists who may be forced to sell (see discussion below of benefits). In practice, Oxfam's field teams found that to obtain a hundred or more animals at a time usually meant dealing with livestock traders (or alternatively holding flocks under project control for an extended period, also a risky practice). Livestock traders in northern Kenya are often Somalis, from outside the local community and this practice led to public accusations of favouritism in Kenya's national press. Another difficulty is that the very young animals which are easiest to buy locally are more vulnerable to drought and not

yet ready for breeding. Buying teams required training in the selection of animals, and had difficulty obtaining sufficient female goats to meet project quotas. The first project bought mostly sheep because of their lower price and greater availability, but the policy was changed when it became clear that in a bush environment goats have a higher value and give more milk for household use.

Once purchased, animals require inoculation, branding, and protection until families come in to take charge. Where several families are to receive stock on the same day, it is advisable for them to draw lots, allowing each to pick only a few animals in turn.

d. *Conditions at transfer*

In Kenya, one is told that in the initial Isiolo pilot project the livestock transferred were treated as an outright gift, but in the subsequent projects as loans. In practice, all of Oxfam's restocking projects attached several conditions to the animals given out. At later stages these included:

i) acceptance of monitoring;
ii) no sales or slaughter in first year;
iii) some sales of males in second year with monitor's approval;
iv) exchanges to be approved and recorded;
v) all animals marked and periodically checked;
vi) movements of family to be recorded;
vii) family to acquire full rights after two years 'but may be required to return the original stock'; and,
viii) 'a family will be expected to return to a full-time pastoral life'.

These rules were signed and witnessed for each recipient. Those interviewed were quite unclear if and when repayment might be required. Though the transfers were described as a loan, as far as we could ascertain in early 1987 no animals had yet been repaid in any of the projects. Subsequently some repayment has begun in Samburu, where Oxfam retains a Kenyan supervisor, and where 'restocking committees' at the local level continue to function. By calling the transfer a loan, the projects helped families resist claims for animals from relatives (in payment of past obligations); they also assist those refusing to pay 'voluntary' contributions to each local chief's Harambee fund.

e. *Rations & equipment*

Accompanying its small stock, each recipient household also got a pack animal (donkey or camel), plastic jerry cans for carrying water and an axe or panga. Equally vital was the continuation of food rations. For the initial Isiolo project, Oxfam undertook this supply directly by giving each family two 90 kg bags of maize - supposedly to last six months - followed by a second issue of the same amount. Several of those interviewed said

that actual consumption was roughly one bag every 4-6 weeks, so families obviously relied on other food sources. In the Turkana and Samburu projects, recipient households continued to receive food rations (one bag of maize every 45 days) from the administration (the TRP) for between 9 and 12 months.

f. *Grouping of recipients*

At first it was suggested that households receiving animals might be organised into mutual assistance, herding groups: Oxfam 'olalas' or 'adakars' as the case might be. Where particular families were short of labour and without relatives, they did sometimes join together; most, however, chose to reside with other, already established groups.

g. *Monitoring*

In contrast to the short period needed for giving out livestock, a relatively long period is required to monitor the degree of success achieved by recipients. The information desired relates both to operational difficulties and to evaluating socio-economic impacts.

Operationally, somebody must monitor animal health to alert outsiders and perhaps organise assistance if large numbers of animals are lost from disease, drought, or raiding. In all four projects, Oxfam's local staff became involved in protecting recipients' animals, either directly by treatment or indirectly by ensuring drugs and veterinary help was available. Monitors were usually engaged by Oxfam on a salaried basis, for a year or more. They would visit restocked families each month to record herd performance. In Samburu, they were assisted by local committees, but otherwise they dealt with families directly. There was a tendency for monitors to cluster around the project office, becoming brokers for the supply of external assistance. To counter this tendency, most monitors were posted into the communities being restocked and made responsible for following up anything from 30 (Wajir and Isiolo) to 50 or more families (Samburu and Turkana).

A basic difficulty the Kenya projects never fully overcame is the precision and comprehensiveness of data which either livestock specialists (looking at herd performance) or sociologists (evaluating family survival) require. Either a senior supervisor must be resident with the field team (if not permanently then at least while baseline data is being collected), or else one must be willing to accept only the most rudimentary data. Oxfam's projects chose something in between, paying monthly salaries to school leavers who sometimes worked unsupervised and whose data is of suspect quality. Unreliable data is simply not worth collecting and analysing, and it needs to be recognised that to ensure data quality requires a highly skilled field supervisor. A possibility not tried within Kenya would be to do away with monitors entirely, by relying instead upon

local committees for surveillance. In any event, how to best provide monitoring remains an open question.

h. *Technical support*
There are three areas where restocking projects require technical support:

i) in deciding the number and type of animals to provide;
ii) the selection and treatment of animals on purchase; and,
iii) the supply of drugs and health care for livestock subsequent to restocking.

Kenya's Oxfam projects initially supplied this technical input directly, by hiring an experienced livestock consultant and by advancing funds so that project staff could hold drugs and do treatment as required. (One of Oxfam's Kenyan staff has technical training in animal health and range management.) This approach infringed on the veterinary department's domain. It is notable that with one exception the projects did not work closely with each district's veterinary services. The veterinarians, in turn, saw little reason for supporting an activity in whose planning and implementation they were not involved. From the standpoint of replicability, this is a potential weakness. Unless a restocking project can safeguard animal health, the whole programme can be put into jeopardy if restocked families lose many animals.

i. *Timing*
Accidents of timing can have a great deal to do with the success of a restocking project. If recipients get animals which will produce young quickly and at a time when there is ample forage, the flock/herd size can increase rapidly. If, instead, animals are bought when *prices* are low (usually during the dry season or when a drought looms), purchasing will be easy but survival imperilled. Offering of food rations, as Oxfam did, somewhat reduces the seasonality constraint but it is still significant. For example, the fact that the Isiolo pilot project weathered a severe drought in the months following restocking was a major accomplishment. From the standpoint of meeting people's needs and giving herds the best chances for survival, projects might consider paying more to get animals in good seasons.

Timing also impinges on the field team doing the restocking. Some of the operational difficulties experienced in Turkana were of Oxfam's own making, because of a set target to restock 500 families. Attempts to move rapidly into a mass programme may cause poor screening of recipients and may strain purchasing arrangements.

Costs and repayment

The Isiolo pilot project was estimated at its conclusion to have cost a total of just over a million shillings (1,109,509) for the first year's effort in restocking 70 families. This worked out at the then current exchange rate at £792.50 (K shs 15,850) per family. Subsequently Richard Hogg prepared a draft budget for a six month continuation of the project to include a further 100 families (to receive 70 smallstock each). This was estimated to cost £863 per family (1986 prices). Both estimates omit certain supervisory costs, such as visits by Oxfam's Nairobi staff or assistance from technical consultants, but nonetheless provide a rough figure for deriving likely direct costs for an expatriate supervised 3-6 month project. (Cost figures on Oxfam's two larger projects are as yet too incomplete to be used as a basis here.)

There is little doubt, then, that restocking projects tend to become expensive quickly when compared against the usual small-scale programme for farmer training, shallow wells, etc. The main cost components to identify include:

- salary, transport and housing for the project leader;
- cost of animals x number of families;
- cost of rations x families x months;
- any other provisions or equipment given out; and,
- monitors' salaries x months of monitoring.

The first and last elements are quite variable depending upon the design of a particular project, and bear close watching. Had Oxfam not enjoyed World Food Programme assistance, its operational costs for storing and distributing rations might have been substantially higher.

However, we should bear in mind that restocking projects are a type of entitlement programme, designed to equip households to re-enter the pastoral economy. Entitlement programmes of any kind - whether giving farmers plots in an irrigation scheme, blacksmiths equipment to produce, or pasturalists the herd to manage - are *far* more expensive than most non-entitlement measures. For example, the Ewaso Ng'iro Irrigation Cluster from which the first restocked families came spent about 33 million Kenyan shillings to 'develop' 162 ha (between 1972 and 1981). This represents K shs 203,704 per hectare (one family's allotment), and yet, as of 1986 probably two thirds of the developed area was not being irrigated at all. Restocking projects appear fairly attractive when compared against the alternatives in their same environment. An even stronger case could be made if one assumes the animals provided will be repaid eventually to permit restocking of still other families, but to date no repayment has occurred and the projects lack the kind of continuing organisational presence which would be required.

Benefits and incentives

The main benefit from a restocking project occurs when destitute households rejoin the pastoral economy. If they do, the local administration is relieved from the continuing supply of food rations and in this sense, restocking constitutes a regularised and phased means for breaking a household's dependence upon external food aid. And of course, during the time when the project is accumulating smallstock by exchanging maize or supporting recipient households with food rations, others in the community continue to benefit and the terms of trade for livestock are reinforced.[5]

Achievement of the primary goal occurs gradually, as a household obtains young stock and as it becomes more mobile. Even then, disaster can wipe out the gains and force a family back into external dependency. For example, two families in Isiolo during the drought had their flocks drop to 13 and 20 respectively; now each after two good seasons is nearly back to where they started (50 animals) with 47 and 48 left. Crude indicators of success include: (i) whether the household is, in fact, surviving without further food aid; (ii) the gross size of the household's herds/flocks; and, (iii) if they have been able to resume a semi-nomadic existence by moving away from the initial restocking base. Since this process may take three or four years to achieve, some type of monitoring of restocked families is desirable (see above).

In their current form, Oxfam's Kenya restocking projects have been very popular. As one woman whose family had experienced considerable sickness exclaimed, "Without these sheep, we would be finished." The immediate incentives include not only the prospect of becoming self-sufficient again - the major goal among most recipients - but also the access to a transport animal (which can be used for carrying wood and water for sale to others in the vicinity) and rudimentary equipment, as well as continued access in the short run to food rations. The projects differed in how much food they allowed and for the length of time it was continued; the initial pilot project erred in under-estimating household needs. Access to rations is essential to free people from the necessity of selling or slaughtering the animals they receive.

Pastoral institutions

Any short term intervention should not aim at establishing new socio-economic institutions. Of necessity, Kenya's restocking projects have had to rely upon existing pastoral and administrative mechanisms (probably to a greater degree than recognised).

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[5] Among the few public criticisms made of Oxfam's Kenya projects, one was that they inflated the prices for goats in the local markets - a complaint advanced by traders used to obtaining animals very cheaply.

A fundamental precondition for success has been an 'open range' situation where grazing, browse, and water are a common property resource. So far, those receiving stock under the four projects have been allowed the necessary access to grazing and browse; there have been a few, isolated problems over access to water (usually the first common property resource to come under individual control). However, in Samburu district the lands being used have been divided into group ranches. While not yet finalised, these claims could result in the exclusion of all non-members from grazing presently used by restocked families.

Within the recipient socio-economic systems, there are different arrangements concerning owning, managing, and using livestock. While there are recognised herding groups, these tend to have a fluid composition depending on immediate convenience and also may differ between the wet and dry seasons. Herding groups usually do not have any power over entitlements: they do not actually own animals, and they cannot re-allocate livestock or their progeny. Thus the initial hope that Oxfam might save itself administrative expenses by simply allocating a quota of animals to each herding group (i.e. 'adakar' in Turkana) appears unworkable. In interviews people admitted that local leaders knew who was in greatest need, but pointed out that actual allocations were a very sensitive matter and had already led to conflicts within families over accusations of favoritism.

The same argument applies to the proposal that an external donor might simply hand over livestock to existing entitlement groups. Among both the Turkana and Samburu, it is the senior males in each kinship group (or extended family) who control its stock. One reason for the prevalence of raiding is that this is virtually the only way for younger men to acquire their own livestock - a clear indication that the present entitlement system does not meet everybody's needs.

Providing a household with smallstock allows it to participate in a network of social transactions linked to or symbolised by livestock transfers. Actually, pre-existing claims of this nature can even threaten a family's retention of animals after having been 'restocked' - a powerful argument for terming the transfer a loan rather than a gift, since in the traditional system the circulation of loaned animals to pay off social debts was usually restricted. Thus there does seem to be an advantage in employing indigenous terms for stock-sharing if these are already seen to involve restrictions upon the use of the loaned animals. It also regularises the transaction by putting it in a familiar context (important if a loan). Where destitute households are being restocked, it may be important to increase the control women exercise over the animals received, given the high rates of divorce and prevalence of female-headed households (see discussion under item 7 below).

There is a larger, philosophical issue at stake: whether as a matter of principal interventions should encourage the effective operations of larger social groupings within the community: clans, committees, etc. Those accustomed to village life where people accept common obligations within a corporate entity may find it disturbing that the Kenya restocking projects did not facilitate such ties. However, in East Africa pastoralists generally do not live and move as clan members and clan ties are perceived as being inherently *corrupting*. Nor is residence in compact villages, such as are found in North Africa or the Sahel, common. Experimentation with new institutions such as owners associations, etc., may still be desirable for other reasons, but it will require a high degree of organisational support and thus is not an appropriate goal for a short-term intervention.

Administrative institutions also become relevant when a restocking project is being considered. Most of those given animals had already been receiving food relief through existing arrangements invólving the chief's or sub-chief's committees or, in Turkana, the Turkana Rehabilitation Project. The restocking projects benefited from being able to rely on other organisations to distribute food rations, and in this sense were supported by the larger institutional system. Any large-scale restocking programme will necessarily require linkages of this kind.

Women

Since possibly over half the destitute families still on food relief in pastoral areas are headed by women, restocking is potentially of major significance to them. The interesting finding from the field visits was that the Wajir project, where most of the recipients were women, appeared quite successful even though the Somali recipients got the lowest numbers of smallstock each (30 per recipient). Women with dependent children have a high incentive to keep their herds in good condition, since there are fewer alternative livelihoods open to them. It seems also that by equipping a woman with animals she becomes more marriageable within a pastoral system where stock ownership is important. On the negative side, where selection of recipients is controlled by men there appeared to be a bias towards restocking male-headed households (given the preponderance of women on the food relief lists). Here the complicating factor is the possibility that those receiving relief have been left there deliberately by spouses as part of a family survival strategy. It is extremely difficult for outsiders to judge which are the genuine cases of abandonment and true destitution. In any future projects, more attention should be devoted to learning how existing entitlement systems work (see 'pastoral institutions' above).

An interesting feature of the Isiolo pilot project was the stipulation that each married man receiving stock would give 10 ewes and 1 ram to his wife (or 5 each if he had several wives). Should a divorce occur

subsequently, these animals and their progeny would remain the wife's property. As the donor of animals, Oxfam encountered minimal resistance to this condition - an important precedent for future projects. It seems, however, that Oxfam's subsequent Kenya projects did not retain this feature for reasons that are as yet unclear.

One other gender-related issue might arise in some groups if restocking were based on camels. Among the Somali, it is said that only men may milk camels. Since, however, even among the Somali, women do take camels to water and one of the best camel trainers in Kenya is a woman, there is nothing 'natural' or inevitable about this practice. The Somali women interviewed who came from camel-keeping groups admitted camels require close supervision but said they could find ways to mobilise the necessary help.

Replicability and similar programmes

After Kenya's 1984 drought, many NGOs became temporarily involved in some kind of restocking exercise to give ex-pastoralists a temporary boost during the period when they lost most of their assets. In Samburu District around Baragoi, for example, the Catholic Church, World Vision, and the Lutherans were all doing some restocking. The Catholic mission estimates they assisted up to 150 families, given between 5 and 30 goats each (but usually ten or less) as an outright gift. World Vision has distributed 3,500 goats to 600 families (thus averaging slightly over 5 per family). The Lutheran Mission restocked 16 families with between 16 to 18 goats. In this instance animals were lent rather than given: the terms being that the female provided remained the property of the mission and could not be killed. Any male progeny would belong to the family, but the second female kid would be repaid to the mission in exchange for the family acquiring full rights over the original goat.

It is clear that in most instances the NGO restocking efforts were aimed at immediate relief rather than getting households back into semi-nomadic pastoralism; and, with some exceptions, little attention was paid to how families managed the animals received. Oxfam's projects appear to be the only fairly extensive programme which gave recipients sufficient smallstock to be the nucleus for a viable livelihood within a year or two of the transfer. As such, these projects are extraordinarily important - possibly the single most important thing Oxfam has done for East Africa's pastoralists. This implies the need to document and evaluate this experience carefully.

Kenya's restocking projects have been very popular at the local level. Oxfam's files in Nairobi bulge with requests for more aid of this nature. In most of the communities visited, there are still many families depending on food relief - sometimes up to six or seven years after they became destitute (e.g. in Turkana). At over half the stations visited, one could

easily have doubled the scope of the restocking project. From the standpoint of need and the fairly encouraging results achieved to date, it seems the original four projects could have been replicated much more widely than they have. Oxfam, Kenya, has also talked of hosting a country-wide review by NGOs of the restocking experience (and it is unfortunate this did not occur when interest was at a peak). Instead, the constraints appear to be a general uncertainty about how to proceed in organising such efforts, and a shortage of external finance for doing such 'experimental' projects.

Impacts

The project recipients visited in compiling this review were at various points in the degree of their recovery. Only a few have been unable to resume a livelihood based mostly on livestock, and in this regard at least the projects can be viewed as a 'success' (particularly if the record is contrasted against achievements of other entitlement programmes in the same areas). Even so, one could see unresolved problems serious enough to threaten this achievement. In Isiolo, there had been a virulent outbreak of cerebral malaria after many families returned (temporarily, one was told) to the original restocking site at Malka Daka. In Samburu and Turkana, some families still awaited animals promised to them even though restocking had been brought to a close in both districts (mostly donkeys or camels not yet obtained). In some Turkana communities, losses of goats to disease after restocking have been high. One came away from Turkana and from Samburu with a sense that those who had been restocked in both districts were still quite vulnerable, and might well require additional technical support in the future.

It is unlikely that these projects led to any appreciable increase in local stocking densities, given the small number of families assisted in any one place and the goal of encouraging households to resume seasonal migration. By the same token, however, the relatively small scale of the restocking efforts has meant that many potential recipients could not be included. People in some of the communities visited remain in dire need.

Perhaps the most important impact of Oxfam's restocking projects is the demonstration that such an approach is operationally feasible and is cost-effective in comparison to alternatives. The advocacy of a restocking approach by Richard Hogg and Brian Harley, both former Oxfam consultants, had a great deal to do with popularising the concept in East Africa. But operational success needs to be demonstrated by full documentation and careful assessment, particularly if the projects prove only partially effective. Unfortunately, the things one would like to know - how many smallstock constitute a viable flock/herd, which categories of households are left out of existing entitlements, and how families survive over the longer run - are not easy or cheap to learn. For the Kenya

projects, this task remains to be completed, though it is hoped this small case study provides some assistance.

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Agricultural Administration Unit Occasional Paper 12

This book describes four practical attempts to intervene in livestock production systems in Nigeria, Sudan, Kenya and Botswana. Selected from recent issues of ODI's *Pastoral Development Network*, chapters consider decentralised animal health systems (paravets), the creation of fodder banks, grazing cells and the restocking of pastoralists after drought.

Each chapter in this volume describes an attempt to find a practical solution to a concrete problem, and to implement that solution in the field. Each of them is an ingenious and self-critical attempt to improve the condition of African pastoralists. In a development sector notorious for outright failure, this is no mean achievement.

Dr Clare Oxby is a social anthropologist specialising in development issues. In addition to intensive research among the Tuareg of Niger, she has worked widely throughout Africa for the FAO, EEC and a multitude of other government and non-government organisations. She is a past editor of the Pastoral Development Network, and currently works as a freelance consultant.

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