

**A REVISED NOLIDEP STRATEGY FOR SUSTAINABLE RANGE  
MANAGEMENT IN THE NORTHERN COMMUNAL AREAS**

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***DRAFT FOR INTERNAL CIRCULATION AND COMMENT,  
NOT FOR QUOTATION***

*Maize growers on the leached soils of the Central African plateau, bean producers in the volcanic highlands of East Africa, and flood recession rice cultivators in West Africa - we hardly expect to find identical solutions for their diverse farming problems. Then why - two decades after farming systems research was popularised - do we continue to recommend that standard package of interventions for African livestock keepers: increased marketing, destocking, and pasture rotation? Who is shackled by tradition - the producers, or us?*

*- ignores environmental variability  
- popln increase  
- monitoring*

## TABLE OF CONTENTS

<b>Background and principles</b>	3
<b>The project area and the challenge of diversity</b>	5
<b>Forage management in feed-limited systems</b>	6
<i>Riverine Kavango villages</i>	6
<i>The Cuvelai Basin/oshanas</i>	7
<i>The Zambezi floodplains</i>	8
<i>Summary</i>	9
<b>The management of water-limited systems</b>	9
<i>Western Kunene</i>	9
<i>Oshikoto Region</i>	10
<i>The Kavango interior</i>	11
<i>The forested uplands of Caprivi</i>	12
<i>Summary</i>	13
<b>Water development policy</b>	13
<b>Communal land tenure legislation</b>	15
<b>Pasture resting and the control of stock numbers</b>	16
<i>Rotational grazing schemes</i>	17
<i>Stocking rates</i>	18
<b>References cited</b>	21

This paper provides an up-date and restatement of NOLIDEP range management objectives and procedures, building on an earlier 1997 paper of the same title and staff submissions to the NOLIDEP *Reformulation Report*, published by IFAD in 1997.

The original 1997 strategy paper for NOLIDEP's sustainable rangeland management programme was based largely on experience outside Namibia (NOLIDEP 1997). This up-dated strategy document reflects an additional year of project implementation, the results of socio-economic research in six of the seven regions in the project area, and work in progress on the botanical assessment of rangeland resources. We are now in a position to move beyond a statement of general principles and provide recommendations tailored to specific conditions within different regions of the NCAs.

### **Background and principles**

NOLIDEP is a combined livestock development and rangeland management project. This means that the project must serve several purposes that are potentially contradictory. Under its mandate to develop livestock production, the project should promote increases in livestock output to improve the economic welfare of herd owners. Under its 'sustainable rangeland management' component, the project must fulfil these economic objectives in a way that is consistent with maintaining or improving long-term environmental conditions in the NCAs.

The original NOLIDEP project design assumed that the best method for meeting these objectives was the replication in communal areas of range management practices found on Namibia's commercial ranches, and the project at inception was directed to set up 200 semi-commercial ranch units. It was also assumed that the project's beneficiaries - local stock owners - would support the creation of ranches and that the project could be 'participatory' despite promoting a standardised package of interventions. These assumptions were unfounded. Regional project staff quickly discovered that most small- and medium-scale livestock owners were disinterested or actively opposed to fencing open rangelands. In 1996 the original project blueprint was abandoned.

Project reformulation - which began in 1996 and concluded in 1997 - reflected the following constraints:

- Experience has shown that resource conservation in Africa must pay real and immediate dividends if farmers of modest means are to adopt programmes requiring more cash or labour. This means that environmentally sustainable rangeland management must address farmers' and herders' current problems in ways that are consistent with their long-term interests.
- Because of decades of colonial neglect and war, there exists no experimental evidence specific to the production systems and natural

environments of northern Namibia upon which NOLIDEP can base its range management programme (Bester nd: 8).

- NOLIDEP is primarily an implementation rather than a research effort. Despite scientific uncertainties, it was hoped that the project would quickly spend a lot of money - about USD 15 million in seven years. This meant that implementation could not be delayed while basic background research was carried out, and research and implementation had to proceed simultaneously.
- Labour- and skill-intensive field research to plan project interventions was impossible in all the project pilot communities given the size and diversity of the project area and the limited number of project advisors and support staff. The staffing situation in MAWRD - responsible for implementing the project over the whole of the NCAs after contract staff depart - was even more limited. At project inception the Ministry employed several range management professionals but no senior social scientist, a situation that has thusfar deteriorated rather than improved.<sup>1</sup>

Taken in combination, these constraints meant that NOLIDEP had to develop reasonable environmental safeguards in a situation in which neither prior scientific research nor adequate professional staff were available or likely to become available. Project redesign reflected these constraints: It was clear that long-term project success depended upon rural communities undertaking much of the responsibility for setting locally meaningful and environmentally sustainable development goals. Three aspects of project re-design reflected this reality.

- First, it was important that communities undertook their 'development planning' in a national policy environment that encouraged environmentally sound decision-making at the local level. Project work on communal land tenure legislation and water development policy resulted from this recognition. This strategy paper returns to these issues, reviews progress thusfar and outlines further steps that need to be taken.
- Second, it was clear that NOLIDEP had to prove its usefulness in addressing problems perceived at the community level, if it was to have any local credibility or influence. Communities wanted water development and - despite the environmentally sensitive nature of this activity - this was the most common point of entry for the project into community affairs. Communities were much less interested, and even antagonistic, towards stocking rate controls and formal systems of grazing rest and rotation, despite the interest of donors in these activities. This strategy paper also addresses this apparent divergence of objectives between local communities and international funding agencies.

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<sup>1</sup> As of the writing of this report, there is no senior social scientist and only one range management professional in government service within the Ministry of Agriculture.

- Finally, it was evident that NOLIDEP had to learn by doing rather than before doing. The project had to act without the luxury of comprehensive background research, and quickly learn from its mistakes and successes - a process known in applied ecology as 'adaptive management'.

NOLIDEP had, in effect, become a large, open-air experiment in participatory resource management. Like any genuine experiment, the outcome of NOLIDEP remains in doubt. This strategy paper is part of the project's attempt to assess the effectiveness of its programmes and adjust its future activities in light of past experience. The opening sections of this report emphasise the differences between production systems in the project area and the distinctive needs of these systems. Closing sections of the report discuss the project's position on a number of central issues - the debate on stocking rates, the efficacy of pasture resting, water development policy and communal land tenure legislation. Our position on these controversial issues provides the common elements of NOLIDEP's strategy for sustainable rangeland development across northern Namibia.

### **The project area and the challenge of diversity**

The project covers all of Namibia north of the veterinary cordon fence - an area of nearly 170,000 sq km spanning an east-west distance of over 1,200 km. Nearly half of the country's population lives in this area.

As might be expected within a geographical and population unit of this size, conditions are diverse. There is a pronounced rainfall gradient from less than 50mm per annum in the west to more than 700mm in the east, and a consequent gradation of grazing and cropping potential, vegetation types and farming and herding systems. Some 15-20 different ethnic groups, several languages and many distinct dialects are also represented in the NCAs.

Meaningful generalisations about the NCAs are therefore difficult to make, although they are necessary for the design of national policies that apply uniformly throughout the area. Some of the general characteristics and constraints of communal areas have been previously described (Sweet 1997), and we will return to these issues later in this report. Equally important, however, is the identification of some practical procedures for dealing with diversity. At reformulation and in the earlier strategy paper, we drew a distinction between migratory and sedentary livestock production systems. Further field research suggests that this distinction is inadequate for planning purposes. All grazing systems in the NCAs involve seasonal stock movement. The distinction between sedentary and migratory systems is, therefore, a matter of degree rather than kind, and highlights few functional differences that are significant as a guide to planning and intervention.

A more useful categorisation for participatory range management planning is the distinction between grazing systems that are feed limited and those that are water limited. Feed limited systems are those in which animal performance, output and numbers are constrained by the unavailability of natural forage. Water limited

systems are those in which performance, output and numbers are constrained by insufficient feed adjacent to water, rather than insufficient feed overall. Between these two extremes are systems which shift seasonally - at one time of year limited by forage and at another by water supplies.

In the NCAs, forage-limited grazing systems tend to occur where water supplies are naturally abundant and, as a consequence, human and livestock densities are high. These conditions occur in Caprivi among communities with access to floodplain grazing along the Zambezi River, in Kavango riverine communities (none of which currently participate in NOLIDEP), and in NCD in the Cuvelai basin/oshana complex or along the recently-constructed canals. Other factors may complicate the picture, but in all these systems increased feed output has the potential to directly increase animal output, and more intensive natural forage management and/or fodder cultivation may be of interest to communities.

Water limited systems in the NCAs predominate in Kunene Region, in the forested areas of NCD (most notably Oshikoto), the interior of Kavango, and in those parts of eastern Caprivi without access to reliably inundated floodplain grazing. In these areas, local interest in closely managing natural forage resources tends to be minimal. Producers instead focus their efforts on obtaining more widely distributed water supplies which will automatically give them access to more forage. In this setting, participatory range management is largely reduced to an exercise in appropriate water delivery.

The distinction between feed- and water-limited systems is important because it helps to predict the kinds of development interventions communities are likely to request, the extent to which they are willing to more intensively manage natural vegetation or invest in the production of additional cultivated forages, and the likely economic returns to different kinds of project investment. Below we examine the problems and potential for NOLIDEP natural resource management activities in these two very different settings. This discussion is based largely on experiments in range management carried out at the regional level and on the results of NOLIDEP's socio-economic research programme.

### **Forage management in feed-limited systems**

Conventional range management practices stand some chance of being accepted by producers whose daily experience suggests that natural feed supplies are finite and must be husbanded carefully. In this section we examine this possibility in three different settings.

#### *Riverine Kavango villages*

Careful biological research would almost certainly demonstrate that animal performance is depressed by poor nutrition in villages along the Okavango River. But residents of these villages do not emphasise this point. Instead, they see

overcrowding along the river as a problem of restricted space for stock movement in a heavily cultivated area, which results in high fines for stock trespass on fields and quarrels between neighbours. Stock theft and poor animal health are also reported to be important problems. Thus, while animal nutrition may be sub-optimal, farmers do not see it as their most pressing livestock problem.

Attempts to improve animal husbandry are also constrained by the diversity of Kavango livelihood systems, in which stock keeping is but one component and must compete with other activities for family cash and labour. For many families, incentives to improve livestock husbandry are also diminished by small herd and flock sizes, while large herd owners have already discovered a cheap solution to forage availability problems - they move inland (Behnke 1998a).

**Activities: The identification and provision of low-cost animal health care regimes for non-scheduled, chronic diseases is the most appropriate entry point for NOLIDEP in these communities. Range management is low on the agenda of producers, who have a low capacity and few incentives to intensify their feed management practices.<sup>2</sup> Live fencing may be of interest in areas where timber and brush are scarce. Research on forages for fallow fields may also be an option. However, invasion by *Cynanodon dactylon*, a preferred forage species, is one of the principal reasons farmers abandon fields. When benefits are weighed against costs, natural sequences of plant succession on abandoned fields may prove to be a more attractive option than ley farming, although this needs to be investigated.**

#### *The Cuvelai Basin/oshanas*

In the oshana region of central NCD, land pressure is high and agro-pastoral production systems are changing more quickly - and support more people - than in any other part of the NCAs. These changes are accompanied by small-scale peasant-based range enclosure, as customary transhumance patterns collapse under the weight of more people and animals, commercial pressures, and the more even distribution of watering points (Christian 1998). Traditional pasture rotations involved seasonal movements between main settlements and peripheral cattle posts. As dry-season grazing becomes more restricted, long-distance stock movement is being supplemented by the seasonal rotation of animals between common ranges and privately owned and fenced enclosures, or *ekove*, around homesteads and arable fields.

**Activities: Control over communal rangelands hinges on control of the water points that render these areas accessible to livestock. NOLIDEP is currently attempting to develop new water points in a way that will increase community control over these installations and surrounding**

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<sup>2</sup> Further research may demonstrate that goat production in Kavango is neither water nor feed limited, but rather constrained by disease. This conclusion is suggested by high rates of goat reproduction (which suggests adequate levels of animal nutrition) and equally high rates of morbidity and mortality, especially in young stock.

pastures. These experiments will continue, although one observer doubts their probable effectiveness in areas of high land pressure (Christian 1998).

The innovative 'growth' side of oshana farming systems lies, however, on private rather than communal land. Oshana farmers are keenly interested in NOLIDEP's adaptive research programme, which they want to be conducted on their fields, in preference to communal land or government research stations. Their interest is understandable: Intensification and technical innovation are probably the only way their food production systems can keep pace with human population growth. Evolutionary changes of this kind are documented both world wide (Boserup 1965) and in semi-arid Africa (Pingali et al. 1987; McIntire et al. 1989), and have produced conservation benefits in the long run (Tiffen et al. 1994). It may be more practical for NOLIDEP to support the intensification of these farming system than to struggle in vain to suppress livestock numbers. NOLIDEP's future adaptive research programme will therefore concentrate on farmers' fields in NCD. A study of *ekove* management is planned in the coming year to support this reorientation of the adaptive research programme.

#### *The Zambezi floodplains*

The Zambezi floodplains are geographically extensive, but they are not evenly used. In the dry season, households relocate from their plateau villages to hamlets on the floodplains, where they both farm and pasture their animals. Although the floodplain is large, the distribution of animals is linked to the availability of agricultural land, which is limited, and the number of herd-owners who can claim land in a particular place. Garden sites on the floodplains are scarce, valuable, and inheritable private property the ownership of which is constantly contested. Plains hamlets that attract many residents from several plateau sub-villages may experience high grazing pressure at the end of the dry season, which is exacerbated by the poor quality of natural forage on the plains and uncontrolled veld fires (Sikana and Kamwi 1997).

**Activities:** Conventional forms of rest and rotation borrowed from commercial ranches are not suitable in this instance. On the floodplains, nutritional stress occurs in the late dry season when stock are dependent on seasonally inundated pastures which are already annually rested due to flooding during the vegetative growth period. Moreover, problems do not arise because there are insufficient quantities of vegetation, but because it is rank and the burning that renders it edible is uncontrolled. Burning destroys large quantities of unpalatable vegetation in order to produce small quantities of palatable regrowth. Sequential burning to stagger the destruction of old plant material and the creation of new growth has obvious advantages. NOLIDEP is currently investigating - at the instigation of local communities and with their support - the



**construction of fire breaks that would permit controlled burning. This programme will be pursued vigorously and the results carefully monitored. Should questions persist about the environmental impacts of burning, the project could substitute 'burning exclosures' for 'grazing exclosures' in this area, in order to compare routinely burned and unburned areas over a number of years.**

### *Summary*

It is now possible to summarise our approach to range and forage management in feed-deficient grazing systems of the NCAs. We have seen that there is important, locally appropriate work for NOLIDEP to undertake to alleviate feed constraints in some of these communities. None of this work is likely to make these communal areas look like or be managed like commercial ranches. This is understandable, given the very different resource endowments and conditions that obtain in the communal and commercial sectors. Following reformulation, NOLIDEP is not trying to transfer methods from the commercial to the communal sector; rather, it supports the development by farmers and herders of new husbandry practices suited to their particular problems. Even this is not possible in some instances. In riverine Kavango communities, farmers are not unduly concerned about livestock feed deficits. Whatever technicians may say, they have other and more pressing problems, and it may be difficult to obtain local support for range and fodder management initiatives. Similarly, not all arable farmers have soil fertility problems - for some farmers post harvest losses, pest control or seed supply take precedence. Not all communities need range management, and NOLIDEP is in no position to enforce 'solutions' to problems that the farming community does not perceive.

### **The management of water-limited systems**

The supply of improved stock watering facilities decisively alters livestock production possibilities in areas where water rather than forage is the limiting variable. In this situation, no other technical input has such dramatic impact, and none is so popular with rural communities.

The initial rationale behind NOLIDEP's water development programme was presented in the 1997 strategy statement, and our experiences since 1997 are summarised later in this report. Here we examine the implementation of this strategy in four water-limited NCA grazing systems: in western Kunene, eastern Oshikoto, the Kavango interior, and the forested uplands of Caprivi. As in the preceding discussion, the emphasis in this section is on the different conditions in each region and the different development programmes appropriate to each.

### *Western Kunene*

In western Kunene, specialised livestock keepers have adjusted to low and erratic rainfall by creating sophisticated systems of seasonal transhumance involving distinct grazing areas. Livestock owners practice an indigenous form of range management based on the seasonal use and resting of grazing areas and the use of designated areas by certain kinds of stock, as far as possible adjusting stocking pressure to annual fluctuations in rainfall and forage production. The grazing system is managed through intact local institutions that co-ordinate the use of pastures at critical times of the year and control access by outsiders to local resources. There probably is very little that NOLIDEP or MAWRD could teach these people about how to manage this system.

Herd sizes are large, the herds produce a marketable surplus for sale, and owners are prepared to invest in the construction of communally owned water facilities (Behnke *et al.* 1998).

**Activities:** In this case sustainable range management rests on the development of a restrained, community-based water development programme that will strengthen current husbandry practices. Support for this approach to range management has come from NOLIDEP's livestock marketing activities, but not in the form of destocking. Herd owners sell animals in order to obtain cash, not as a means of limiting their herd sizes. Household cash consumption needs are modest, and some of the money from stock sale is reinvested back into improved herd production and growth, providing funds for community cash contributions or for the communities to pay for labour contributions to project-supported water point construction and rehabilitation. Community-maintained livestock auction facilities provide a second source of funds through a 1.5% rebate by Meatco to the community on the value of all sales at the facility. To capture this rebate, communities must form farmers associations. These associations provide an outlet for the talents of younger and better educated rural residents and provide a potential complement to the strengths of the customary authorities.

**In this situation, NOLIDEP's 'sustainable range management' efforts focus on institutional and infrastructural development, rather than technical innovation.**

### *Oshikoto Region*

Eastern Oshikoto is a frontier area of recent settlement and in-migration from more heavily populated regions to the north and east. Driving this process of colonisation is an oscillation between deficits and surpluses of feed and water. Established farming villages to the west tend to have well-developed supplies of water for livestock, and forage availability is the primary constraint on herd performance; vice-versa in the sparsely settled grazing zones of eastern Oshikoto. But this situation is unstable over

time. As settlement density increases and cattle are forced to migrate further and further afield in search of forage, villagers are tempted to relocate their farming operations closer to adequate grazing. Surplus grazing tends to be located in areas where there is a water deficit which prevents year-round habitation and use of the area. But as water sources are developed and more people relocate, a cattle post gradually becomes a village, a grazing surplus is transformed into a deficit, and the process begins anew.

This wave of colonisation is moving from west to east, north to south. Large-scale private fencing is advancing from the opposite direction. Apparently, private enclosure of communal rangeland began to the south and east adjacent to the commercial farming area around Tsumeb and the Mangetti Farms, and is expanding to the north and west. Two mutually exclusive forms of land use - peasant agriculture and large-scale commercial ranching - are therefore expanding into eastern Oshikoto from opposite directions, meeting in the area south of Okangele and eastwards to Kavango (Cox *et al.* 1997; Kerven 1997).

**Activities: Sustainable, community-based range management is at present impossible in eastern Oshikoto, where borehole drilling is undisciplined, the number of water points constructed by government is either not known or this information is not made public, government boreholes are privatised, and peasant communities can suddenly lose their pastures, hand-dug wells or crop fields to large-scale private enclosure. More forcefully than in any other region in the NCAs, Oshikoto illustrates the need to develop appropriate national policies on water development and communal land tenure before undertaking work in the rural areas. Unfortunately, for Oshikoto NOLIDEP's most crucial range management activity is the struggle to inform and shape national policy through applied, policy-oriented research and the publicising of small-holder interests (Behnke 1997).**

**Oshikoto is important because it is an extreme but not an isolated case. Commercial challenges to peasant-based range management exist in more attenuated forms in most NCA regions, and losing the debate on national land and water policies will eventually call into question all of NOLIDEP's community-based range management programme.**

#### *The Kavango interior*

95% of Kavango's total human population lives along the river terrace on about 5% of the Region's land area. While less dramatic, livestock densities follow the same pattern. The primary impediment to further colonisation of the Region's interior is the unavailability of permanent water. Once water is made available, settlements grow quickly through in-migration, reach a maximum size of 30-40 households, but then grow no further because residents drift away to form new settlements.

Range management - which involves the more intensive exploitation of finite forage resources - probably has little to offer households with access to abundant grazing in the Kavango interior. Maintaining the physical separation of wet season grazing areas from cultivated fields is a locally recognised need. A rudimentary system of pasture rest and rotation already exists around inland villages: stock move away from settlements towards areas with sandy soil in the cropping season, and back towards the settlements and cultivated areas on heavier soils after the harvest. This system of seasonal pasture rotation is primarily driven by the need to separate crops and livestock during the growing season, rather than to obtain higher quality forage, which most farmers do not consider a severe constraint (Behnke 1998a).

**Activities:** Some inland communities discourage settlement and cultivation around designated pans which are reserved for use by stock during the cropping season. Because the heavier soils found around pans may also be suitable for cultivation, these restrictions are often difficult to maintain as communities grow in size, land pressure builds, and all areas suitable for cropping are put to the plough. NOLIDEP supports efforts by communities to preserve the distinction between arable and pasture areas. This is done by endorsing local efforts to designate and enforce separate zones for cultivation and grazing, and by helping communities to deepen pans as an improved source of wet-season stock water. While these efforts will neither control stock numbers nor necessarily promote more elaborate systems of rest and rotation, this programme conforms to the needs of Kavango farmers and herders and is supported by them.

In the interior of Kavango, water availability does limit stock numbers, but (unlike Kunene) it may be difficult to use community cash contributions to water development as a means of encouraging responsible expansion of supplies: mechanised water points in Kavango are expensive, herds are small and animals are rarely sold; communities form after a water point has been created, not before; and Kavango residents are reluctant to contribute towards the costs of public water points. As a result, NOLIDEP undertakes rehabilitation but avoids capital-intensive water point construction in this region.

#### *The forested uplands of Caprivi*

Decade-long shifts in regional hydrology have forced the concentration of stock in some areas and instituted an involuntary long-term resting programme for other pasture areas which now lack sufficient stock water. It is inconceivable that any rotational grazing system could come close to having the impact achieved by more even distribution of watering points and grazing pressure. Local herders know this, and it is equally inconceivable that they would implement elaborate grazing schemes if NOLIDEP was unable to address their obvious water problems (Sikana and Kamwi 1997).

**Activities:** Across all regions, NOLIDEP has constructed or rehabilitated water points on a cost sharing basis with local communities. The management and use of these facilities must now be monitored. The situation is particularly interesting in Caprivi where the project has constructed or improved water points both free of charge (in year 1) and with community contributions (in year 2). Comparison of the management of these two kinds of water points should provide valuable insights on the impact of cost sharing on patterns of resource use and control, and provide guidance for the DWA as it begins to implement the government's cost-sharing policy. Follow-up monitoring of water point use is also particularly important because Caprivi is the only NCA region in which aggregate cattle numbers have expanded markedly in the last decade.

### *Summary*

Range management projects frequently attempt to introduce 'improved' range management practices in communal areas. As the preceding regional review has demonstrated, NOLIDEP does not do this. Instead, the project supports community efforts to change their livestock husbandry and resource management practices in potentially sustainable ways. This shift in project objectives is significant. NOLIDEP's range management programme supports changes that are requested by rural communities, that conform to their aspirations, but bear no necessary resemblance to 'improved' practices on commercial ranches. These changes require small, incremental alterations in current herding systems, rather than presenting communities with an integrated 'package' of innovations that would require a complete transformation in the way households behave and communities are organised. Finally, these changes are only potentially sustainable - success is not assured.

Below we discuss some of the reasons why we judge our participatory range management programme likely to succeed, and examine some changes in government policy that would improve the odds.

### **Water development policy**

We begin with two issues - water development policy and communal land tenure legislation - in which changes in government policy would assist NOLIDEP's range management programme.

At all sites investigated in NOLIDEP's socio-economic research programme, community members can readily identify territorial boundaries, and either individual property owners or the local customary authorities control access to critical resources. But these boundaries are not comparable to the border fences of commercial ranches. Almost all boundaries are permeable, the exclusion of outsiders is variable and subject to negotiation, and the degree of control varies according to the kind of resource

(Behnke 1998b). Herein lies the special significance of water in these indigenous land management systems.

Wherever water is scarce in the NCAs, critical water resources are more closely managed and tightly controlled than surrounding grazing areas, which are difficult to delineate and of relatively low value per hectare. Moreover, according to customary tenure, the investment of labour or cash in developing a resource such as a field site or a water point enhances the rights of those who have invested in it. Free goods - either unimproved natural resources or facilities donated by outside agencies or government - are the most difficult for local communities control. In sum, communities or individuals tend to control critical or key resources, particularly sources of scarce water in which they have invested their labour or money (Sweet 1996b; Behnke 1998b). NOLIDEP's cost sharing approach to water development is designed to reinforce community-based water management and - by extension - improve communities' control over the grazing resources associated with particular water points.

NOLIDEP requires communities to make a significant material contribution to the construction of new water facilities either by providing labour or, where this is not possible, by helping to pay for work by contractors. One objective of this policy is to give communities a sense of ownership so that they will in future maintain the facility. A second objective of this policy is to improve the capacity of communities to exclude outside users, should the local community consider this necessary. Since project and community co-financed water points are only becoming operational this year, it is still too early to judge the effect of this policy on local water point management. Monitoring the use of these facilities will be an important component of NOLIDEP's programme in coming years.

It is not too early, however, to obtain an initial impression of the effect of this policy on community attitudes to water development planning. Many rural dwellers do not have a clear understanding of government water development procedures. They make as many demands as possible, as frequently and loudly as possible, and wait to see if anything happens. Often nothing happens, but occasionally - and sometimes for no reason apparent to local residents - the government appears to comply with their requests. Given these perceptions, local communities have little incentive to limit their demands upon government or plan a coherent water development programme for their area.

NOLIDEP's water development policies have attempted to counter these expectations by asking communities to accept formal contractual obligations and a portion of construction costs in return for the reliable provision of promised inputs. Especially in Kunene Region where this policy has been in effect longest, there is already evidence that some communities are adopting a more restrained attitude towards water development.

Changing community attitudes is, however, a long-term process and one that demands still further changes in both government policy and NOLIDEP procedures. The

following adjustments and refinements will be a focus of project activity in the coming year:

- Neither NOLIDEP staff nor rural communities initially appreciated how long it would take to actually construct new water points. This has led both to problems of project budgeting and planning and to unrealistic expectations on the part of communities. In the coming year NOLIDEP will explain why a two-year implementation schedule for water point construction is realistic and use this information to inform communities about the pace at which new installations can be constructed with community involvement.
- Sticking to even a two-year implementation schedule can be difficult. Major delays have occurred in obtaining written technical surveys and cost estimates. These reports are needed very early if communities are to be involved in decision making and the funding of construction.
- Neither DRWS nor private contractors are accustomed to dealing with rural communities which have paid for construction and view themselves as clients rather than supplicants. Improved communications between DRWS, contractors, rural communities and regional NOLIDEP and MAWRD staff is required, and may need to be built into the contracts awarded to construction firms.
- Community cash contributions should be collected prior to construction. NOLIDEP's water development programme was delayed in 1997 because of policy debates over the principle of cost sharing. Because of these delays, tendering for water projects often preceded the full collection of the community portion of construction costs. Field staff now anticipate some problems in collecting this money, since the project has no way to sanction non-payment except to refuse to undertake further work in uncooperative communities.
- Problems of getting communities to comply with their contractual obligations are most acute when NOLIDEP develops water points adjacent to areas that are receiving new water installations free of charge from government or other projects. If NOLIDEP procedures are workable and beneficial, it is essential that they be adopted as a consistent government policy as soon as possible.
- The project's restrained approach to water development is largely negated as long as other agencies are free to construct additional installations with little or no community consultation. Because of their desperate desire to see any form of water development, it is possible to extract agreement for new facilities of almost any kind from almost any community. But people in the NCAs think very carefully before spending their own money on foolish projects. The best way to ensure that communities are genuinely and carefully consulted is to require outside agencies to obtain substantial material support from communities towards construction costs.

At present NOLIDEP requires a 10% cash contribution to the costs of water construction carried out by contractors. The project has the option to increase the percentage contribution of communities in the coming year, but project staff do not favour this option, which would further increase the gap between current DRWS and NOLIDEP procedures. The priority for NOLIDEP is now to demonstrate the effectiveness of its water development policies, standardise its procedures and convince DRWS to adopt this approach as uniform ministerial policy.

### **Communal land tenure legislation**

Community-based natural resource management requires security of tenure (NOLIDEP 1997; Sweet 1997). Without secure land rights rural residents have diminished incentives to use resources on a sustainable basis and no means to limit exploitation by excluding outside users. But there is little long-term security of tenure in the NCAs over resources critical to livestock production.

In all but the Kunene community studied by NOLIDEP, privatisation of pastoral resources by individuals is occurring as people invest cash incomes back into the pastoral sector and larger herd operators move towards commercial production. This process is most advanced in eastern Oshikoto and Ohangwena Regions where there exists a well-capitalised enclosure movement involving national politicians, civil servants, urban-based wage earners and businessmen, with the co-operation of the customary authorities.

Given these challenges to communal tenure and small-holder interests, it is worrying that new Communal Land Act currently under discussion does not appear to recognise community land rights. The draft Bill provides for land administration at the Regional level of government through the creation of Regional Land Boards. It would appear, however, that the draft Bill does not explicitly recognise collective ownership or secure user rights to communal grazing land and water points or provide a mechanism for formalising communal tenure through the application of groups to Land Boards. This oversight could be amended when the current Bill is re-drafted, and we urge that this be given careful consideration. Legal recognition of community land rights within the Act could build on a large body of practical experience (by SARDEP on livestock issues and MET on Wildlife Conservancies) and research by the University of Namibia, the Namibian Programme to Combat Desertification (NAPCOD), and the NGO association NANGOF.

While tenure insecurity is an acute problem in parts of NCD, we consider it to be a long-term threat to all project activities. Projects such as NOLIDEP can alleviate specific technical constraints, but government policies must provide the legal framework and incentives for communities to take effective control over their resources. Without appropriate policy, technical development initiatives can exacerbate the problems they were intended to overcome (NOLIDEP 1997).



## Pasture resting and the control of stock numbers

The lead recommendation made by the last IFAD/UNOPS project supervision mission (on 30/07/97) demanded that:

All regions should have finalised biological and socio.-economic surveys and subsequent recommendations for implementation of improved range management including the development of rotational grazing practices, stocking rates and provision of appropriate addition[al] water development (UNOPS 1997: 19).

We have already made it plain that NOLIDEP, following project reformulation, does not 'implement improved range management.' Rather it responds to requests by rural communities to develop their current husbandry systems, when requested changes are potentially sustainable in the judgement of project staff and in light of available information. Herein lies the problem with stocking controls and rotational grazing schemes: These are not interventions commonly requested by rural communities in the NCAs. NOLIDEP's programme of work on these issues is therefore a compromise between the concerns of rural communities and those of external donors.

### *Rotational grazing schemes*

All communities studied in NOLIDEP's socio-economic research programme practise some form of rotational pasture use by season. Indigenous systems of seasonally deferred pasture use exist in western Kunene, long-distance transhumance in Oshikoto Region, the seasonal oscillation of animals between cropped and uncropped areas in Kavango and NCD, between uplands and floodplains in Caprivi, and between private enclosures and communal ranges in the Cuvelai basin.

In most of these systems there exist heavily used sacrifice zones around water points and settlements. Year-long or multi-year resting of these sacrifice zones occurs, but on an unplanned basis when water points fail, when there is insufficient rainfall in an area to support livestock, when there are decade-long shifts in regional hydrology, or an area is burned or (in the past) insecure. NCA livestock owners show little enthusiasm for the planned, long-term resting and rehabilitation of these areas through periodic voluntary destocking.

Herders recognise that sacrifice zones are often excessively used from the point of view of forage production, which is insufficient in the immediate vicinity. Instead of rehabilitating these areas they have devised strategies for obtaining low-cost animal feed in other ways or from other places, and the sacrifice zones remain heavily used because they provide valuable benefits aside from forage, such as field and settlement sites and stock water.

This means that introducing exotic grazing schemes will not be as easy as planners often assume. Not always aware of the rationale behind village-level management practices, outsiders frequently assume that improved management schemes are simply

filling a 'management void'. All that is needed is to educate the locals, free them from the shackles of custom and get local communities properly organised. In reality, improved management schemes are competing against established husbandry and resource use systems and must out-perform these systems by providing more benefits or lower costs.

While they are theoretically plausible, the advantages of deferred, rotational and multi-paddock grazing systems have not been consistently demonstrated despite considerable efforts to do so (see O'Connor 1985 for an assessment of work in southern Africa, and Stoddart et al. 1975 on North American research). Often the advantages from these systems are so modest as to be difficult to discern statistically even in carefully controlled experiments (APRU 1978-1990). Given the probable costs of adoption, Namibian small holders are unlikely to realise from these systems the obvious benefits needed to promote their voluntary acceptance. Scientific ambivalence regarding the advantages of rotational grazing offers no encouragement for any attempt to force these systems on rural communities.

We conclude that NOLIDEP would be wise to abandon any lingering nostalgia for commercial systems of grazing rest and rotation, and instead build on existing indigenous systems of resource use. This would involve meeting the perceived needs of rural producers, e.g. with work on fire-break construction on the Zambezi floodplains in Caprivi, by deepening pans in Kavango inland communities, through research on improved forages for small grazing exclosures in NCD, or through water development and support for community institutions in Kunene. None of these innovations will make the communal areas look like commercial farms, but that, following reformulation, is not NOLIDEP's objective.

*Rudi  
Kunene*

Rotational grazing systems may be attractive to communal livestock producers in some instances or in the future. NOLIDEP therefore maintains demonstration trials on these practices and, should any community express interest, will support community-based projects. It is difficult to schedule rotational resting and grazing periods to match consistently with the different growth rhythms and seasonal changes of the various herbaceous and woody components of range vegetation in the project area (NOLIDEP 1997). Moreover, simple resting during the growing season provides the main benefits of rotational grazing without the complication of adjusting the length of grazing and rest periods throughout the year. Project adaptive research and trial demonstrations therefore investigate simple and flexible systems of rotational resting, rather than more elaborate rotational grazing schemes.

#### *Stocking rates*

*say who*

Within the scientific community, stocking rate and carrying capacity estimates are the focus of intense research interest. Estimation techniques are improving, but increased accuracy comes with considerable costs in terms of additional data collection. In the applied arena, approximate estimates of carrying capacity are useful for planning at a broad scale at the regional or national level (Sweet 1997; 1988). The project plans new water developments in relation to an assessment of existing water sources and

grazing potentials, and attempts to avoid water developments that would support more animals than can be sustained by local grazing resources in most years. In the case of boreholes, different means of pumping water are considered, e.g. hand pumps, windmills, diesel and solar power. But whenever feasible, preference is given to small or medium size dams, which are cheap to operate and discourage permanent settlement. Also, with small dams the availability of stock water is correlated through rainfall to grazing availability, and excessive water use is self-correcting since heavily used installations dry up more quickly.

It is widely stated that the NCAs are overstocked. The logical confusion that sustains many of these assessments is discussed in Behnke 1998b, Annex 3, and will not be repeated here. Available evidence on conditions in the NCAs is also equivocal:

- Sacrifice zones are visual eyesores, but provide only anecdotal evidence of widespread overstocking. How extensive are the sacrifice zones? Are they spreading? Is their impact localised or does it ramify throughout the regional ecosystem? And what is being sacrificed - aesthetic values, conservation interests, or hard cash and material benefits for local residents?
- Periodic livestock die-offs in droughts are evidence of temporary livestock feed supply-demand imbalances. But wild herbivores in semi-arid areas experience these population fluctuations, which are unlikely to permanently damage vegetation and provide long-term limits to herbivore population growth.
- Stock densities are high in the central Cuvelai, but herd owners are already adapting to these problems by intensifying both their arable and pastoral production systems and by shifting to private forms of rangeland tenure.
- Only in Caprivi have stock numbers expanded quickly in the last decade, and the causes and consequences of this expansion are unclear. Caprivi wildlife has undoubtedly suffered, but it is much less certain that domestic stock numbers have grown to the point that aggregate livestock output is in decline or threatened by environmental collapse. Preservation of wildlife may be best promoted through programmes that permit rural residents to profit from its preservation and exploitation, rather than by direct attempts to limit herd growth. This is current MET policy through its wildlife conservancy programme and research comparing the benefits of domestic livestock husbandry versus wildlife management.
- Much the same can be said about Kavango timber resources and pastoral expansion into the interior of the region. At present, rural residents profit from further herd growth but may lose subsistence forest products. They lose little from the destruction of marketable timber reserves, which are controlled and profitably exploited by a combination of civil servants and commercial firms. If Kavango farmers could profit from timber sales, they would be more inclined to weigh the benefits of forest preservation against the costs of further herd growth.

- Stocking rate and carrying capacity estimates based on Namibian commercial ranches are misleading and irrelevant to the production objectives of most NCA livestock owners.

We conclude that draconian stocking controls are insufficiently justified on scientific grounds to be recommended for the NCAs. It is further evident that the Namibian Government, like most independent African governments, would find it difficult to implement such controls, should they be recommended. Finally, there are more practical means of addressing the issue of long-term herd growth. These include:

- NOLIDEP-supported research into improved cultivated forage production;
- Policy changes that will allow rural people to internalise the benefits from forest or wildlife resources threatened by herd expansion;
- The gradual removal of government water subsidies that encourage cost-free expansion of herd numbers;
- Improved marketing opportunities that encourage offtake through both the formal and informal sectors;
- Secure tenure rights for rural residents which would empower communities to enforce stocking rate decisions that are locally meaningful.

There is, in sum, a practical option for administrators, field workers or policy makers concerned about overgrazing but incapable of precisely determining or enforcing optimal stocking rates. Instead of dictating stocking rates, they can eliminate government policies that distort local decision-making and help to strengthen institutions that will enforce stocking decisions that are locally taken. This is a genuinely participatory approach to the problem of controlling livestock numbers, one that assumes that communal African stock owners - like commercial ranchers - make rational decisions about their stocking rates.

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