

NEW DIRECTIONS IN AFRICAN RANGE MANAGEMENT POLICY

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The results of a workshop sponsored by the Commonwealth Secretariat and held at Matopos, Zimbabwe, on 13—17 January 1992

INTRODUCTION

In 1990, the Commonwealth Secretariat convened a technical meeting to explore the biological dimensions of African range management. The 25 scientists who attended the meeting examined a variety of new approaches to the study of African savanna ecology. It was clear that the participants agreed on many fundamental issues, and that the consensus endorsed a thorough-going review of mainstream range management practice. The collected papers from this technical meeting will be published in 1992. In the interim, the results of the technical meeting have been summarized by the convenors in an overview essay (Behnke and Scoones 1991).

This overview essay provided the background document for a second workshop on rangeland policy also held under the auspices of the Commonwealth Secretariat at Matopos, Zimbabwe, in January, 1992. This workshop was organized around commissioned case studies (on Botswana, Zimbabwe, Kenya and Nigeria) prepared by scientists from each of these Commonwealth countries. In contrast to the earlier technical meeting, the Matopos workshop concentrated on the legal, social and institutional aspects of communal rangeland management, and was aimed primarily at field personnel, administrators, and policy makers in national ministries or departments active in range management in African Commonwealth countries.

The workshop was designed to acquaint government officers with recent theoretical developments in range ecology, and to discuss the implications of these developments for rangeland policy in their countries. Conversely, the response of the workshop participants to the new ecological concepts provided an initial test of the acceptability of these ideas by those who would ultimately be responsible for their implementation. Some of the highlights of this workshop are summarized in this paper.

THREE PROPOSITIONS

Three propositions regarding the ecological functioning of grazing systems were placed before the workshop participants. These hypotheses arose out of the 1990 technical meeting as summarized in the overview essay. If proven correct, each

of these ecological hypotheses entailed changes in current communal range management policy. These hypotheses and their associated management implications were summarized by the workshop organizers, and presented at the opening session of the workshop.

The three propositions and their associated management implications are as follows:

i) Hypothesis: Ecological and Economic Carrying Capacity

The determination of a rangeland's carrying capacity (i.e. the number of animals it can support over the long term) cannot be based solely on botanical considerations, but must also take into account the management objectives of rangeland users. Misleading carrying capacity estimates are often based on a confusion between ecological and economic carrying capacity. Ecological carrying capacity can be defined as the point at which livestock populations cease to grow because limited feed supplies produce death rates equal to birth rates. Most livestock owners and range managers find it profitable to hold their livestock populations somewhere short of this ecological ceiling. What constitutes an economically optimal stocking rate will vary, however, according to producers' husbandry practices and management objectives. For a variety of reasons, African pastoralists are able to profitably maintain higher stocking rates than commercial beef ranchers. Part of the alarm over pastoral herd growth and 'overstocking' results from the presumption that economically profitable stocking rates for commercial beef ranching are also the only stocking rates which are biologically sustainable. This presumption is rejected.

Management Implications

In Africa a variety of different livestock production systems co-exist. Pastoralists engaged in alternative systems of production will find it advantageous to maintain stocking rates appropriate to each system. Determination of the 'correct' stocking rates in a particular area will be a process of reconciling these multiple objectives. Administrators and technicians can provide assistance in arbitrating the potentially conflicting demands of different classes of producers. The persistent inability of outside agencies to effectively control stocking rates suggests, however, that local communities must ultimately be responsible for enforcing agreements on stock numbers. This implies the devolution of authority over these matters and the provision of technical assistance to local communities, rather than the attempt to impose centralized control.

ii) Hypothesis: Grazing Ecologies not at Equilibrium

In Africa's dry savannas, rainfall variability and other episodic events control both plant and animal populations. The animal and plant populations which these systems can sustain will fluctuate unpredictably with annual shifts in the

amount, timing and spatial distribution of rainfall, fire, disease outbreaks, etc. These grazing systems may be in constant disequilibrium.

Management Implications

Conceived of as a single, safe stocking rate, the concept of carrying capacity is not appropriate to the management of grazing systems not at equilibrium. Policy makers and administrators may instead strive to maintain the ability of herd managers to ‘track’ short term swings in feed supply by responding quickly and flexibly to unpredictable events. Effectively tracking fluctuations in rangeland productivity would require the ability to rapidly destock and restock rangelands, the provision of feed supplements to cover temporary shortfalls in forage production from natural rangelands, and the provision of credit, insurance or other social security measures which will dampen the economic impact of unavoidable environmental fluctuations. Planning for drought and the provision of a degree of security against impoverishment will be essential features of administration in regions where producers are exposed to unusual environmental hazard.

iii) Hypothesis: The Spatial Heterogeneity of Rangeland Resources

African rangelands are ecologically heterogeneous at a variety of different spatial scales. Locally, heterogeneity may be expressed in terms of the patchy distribution of pockets of high and low range productivity, up-slope and down-slope, on different soils within a single drainage system. At the other extreme, heterogeneity may be expressed on a regional scale in terms of soil moisture and fertility gradients which control the quality and quantity of forage production over vast areas, as in the transition from the dry northern Sahel to the wetter Savanna zones across West Africa. A model of savanna vegetation based on the relative balance of available moisture versus available nutrients for plant growth may reveal the underlying biological processes which produce both local vegetation patches and regional variations in vegetation types. It would appear that animal movements—seasonal and annual, local and long-distance, by both wild and domestic herbivores—exploit this variability.

Management Implications

Herd movement is one of the principal techniques employed by African livestock producers to exploit environmental heterogeneity. The preservation of herd mobility requires the legal recognition of existing customary tenure arrangements, especially those which provide for the intermittent or seasonal use of a wide variety of ecological resources. In this context, formal programmes of land use planning should attempt to coordinate movement and regulate access by different user groups, rather than restrict movement. Since movement takes place at a variety of different spatial scales, regulation of this movement will require the development of a hierarchy of management institutions with the

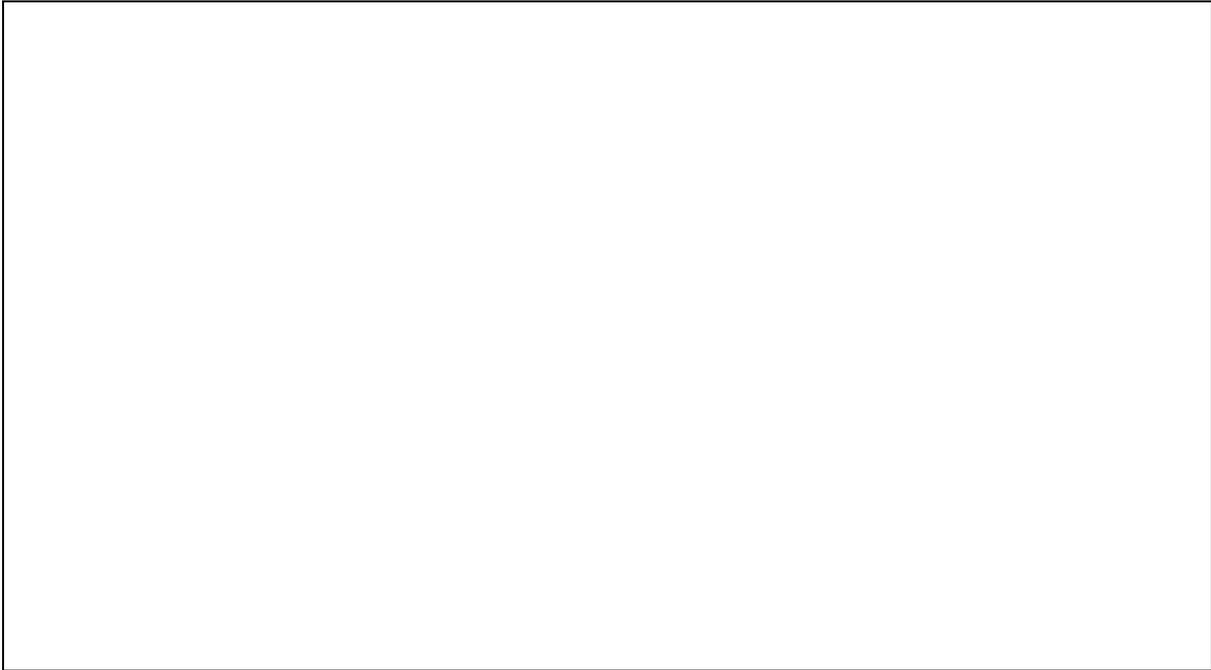


Figure 1 Alternative Stocking Strategies within a Defined Grazing Area

authority to resolve conflicting claims to key resources at local, regional and national levels.

THE REFORM OF RANGE MANAGEMENT POLICY

The preceding hypotheses present a somewhat novel picture of the ecology of grazing systems, and suggest a number of innovations in communal rangeland management. However, if the results of scientific research are to have any practical impact, these results must be incorporated into government and donor development programmes, and reflected in new policy objectives and implementation techniques. This integration between rangeland research and rangeland policy was the focus of the workshop's deliberations.

The workshop investigated several areas in which changes in existing rangeland policy were potentially justified, including a modified approach to the preservation of pastoral land rights, changes in livestock marketing programmes, revised systems of rangeland administration and extension work, and changes in range and livestock research. In each of these areas, the workshop participants asked how existing programmes might be redesigned, if the required changes were financially and institutionally feasible, and finally, if these alterations could produce genuine improvements in rangeland conservation, the material welfare of producers, and livestock output. This paper summarises only those discussions pertaining directly to stocking rates and range management issues; the full workshop proceedings are available from the Commonwealth Secretariat.

The discussions were inconclusive in the sense that they did not seek to produce a set of formal workshop recommendations endorsed by the majority of participants. There was a broad consensus regarding the problems which required attention; how to address these problems was enthusiastically debated, in many cases without final resolution. The following summary makes no attempt to resolve these differences, which highlight areas in which further work is needed before a comprehensive programme of reform is undertaken. The concluding section of this paper outlines a programme of future work for addressing some of these outstanding questions.

Alternative Stocking Rates and Alternative Development Strategies

Figure 1 depicts the policy and planning implications arising from the co-existence of multiple stocking strategies, as discussed in hypothesis (i) dealing with ecological and economic carrying capacity. The figure illustrates the different ways in which feed demand may be adjusted to feed supply in environments in which grazing ecologies are not at equilibrium and, thus, feed supplies vary unpredictably (hypothesis ii). The solid line in the figure represents changes in ecological carrying capacity in a particular region over time, i.e., changes in feed supply. The dotted lines A, B, C and D represent different stocking strategies which could be employed by producers in response to these environmental fluctuations. Although rigidly simplified, Figure 1 allows us to consider the different forms of development assistance appropriate to each strategy.

Strategies A and D represent, respectively, the two extremes of very heavy versus very light stocking rates. In strategy A, herd managers attempt to hold stocking rates at a level which is only possible during exceptional periods of peak carrying capacity. At all other times there is a shortfall in feed supply relative to demand, and problems arise regarding how to feed excess animals. Strategy D represents the other extreme, in which stocking rates are depressed to the point where feed demand never, or very rarely, exceeds supply. But since supply frequently exceeds demand, primary production is wasted in most years for want of sufficient animals to eat it.

Strategies B and C depict more moderate stocking policies in which livestock densities are held at a point near long-term mean ecological carrying capacity. Where the two strategies differ is in their response to fluctuations around this mean. In scenario B, managers attempt to compensate for fluctuations in feed supply by quickly and deliberately adjusting stock numbers, what has been termed a 'tracking' strategy. In scenario C, livestock populations are held constant and shortfalls in the supply of natural vegetation are offset by managers acquiring additional purchased or specially cultivated forage supplies.

Figure 1 depicts four hypothetical stocking strategies which may be employed by African pastoral communities. It is clear that individual herd

owners and herding communities may, under certain circumstances, find it advantageous to combine elements of several strategies or shift from one to another. The purpose of the following discussion is not to propose a typology of African grazing regimes in terms of their stocking rates, but to provide a framework for evaluating the benefits and risks which characterize different stocking strategies. On this basis, outside agencies may judge more accurately the appropriateness, and foresee the wider repercussions, of their interventions in the livestock sector.

Strategy A—High Stocking Rates

Stocking strategy A is insupportable within the geographical confines of any single grazing area subjected to massive swings in rangeland productivity. As suggested by the discontinuous dotted line representing strategy A, the long-term sustainability of this strategy is contingent upon the exploitation of grazing resources outside the area depicted in Figure 1. Put simply, under strategy A, animals walk away from their feed problems by seasonally or intermittently migrating between a number of grazing areas. The resource tenure changes which imperil the continuation of this strategy, and possible responses to these challenges, are examined in a later discussion of resource tenure issues.

Strategy A also suggests some of the ways in which migratory livestock husbandry contributes to high levels of national and regional livestock production. With the partial exception of strategy B, none of the other stocking strategies depicted in Figure 1 are in a position to maintain sufficient animal numbers to consume surplus primary production during localized periods of peak carrying capacity. If they can efficiently ‘mop up’ these surpluses, migratory stock can contribute significantly to total livestock output.

Potential risks

Livestock production based on stock mobility presents technical problems and benefits which are poorly understood. Agricultural research, heretofore premised on the transfer to Africa of ranch technology, has developed few innovations appropriate to migratory production systems, and may not be in a position to offer suitable technical assistance.

Strategy B—‘Tracking’

Strategy B describes a production system in which livestock owners refine their capacity to off-load or acquire stock according to forage availability. As in the migratory strategy, livestock leave the local grazing system, in this case primarily through disposal or death rather than relocation. Development options open in this situation include:

- the retention of indigenous stock breeds which can withstand fluctuations in feed availability
- stock mobility (see Strategy A)
- the development of livestock marketing systems which can absorb massive shifts in levels of throughput
- producer credit or insurance schemes or post-drought restocking programmes

In considering these management options, the workshop focused on the problem of how to design livestock marketing systems for environmentally unstable regions. This topic is given separate attention in the full conference proceedings, but is not discussed in this paper. For the purposes of the present discussion, we need only note that access to a diversity of domestic and export livestock markets is one way to promote the disposal of large numbers of livestock during droughts. One of these potential markets is a privileged sector of the overall livestock production system characterized in Figure 1 as Strategy D.

Potential risks

Producer impoverishment when livestock prices, marketing capacity and rangeland carrying capacity collapse simultaneously.

Strategy C—The Supply of Additional Feed Inputs

Strategy C describes a situation in which farming and pastoralism are closely integrated, either through market exchanges or mixed systems of agro-pastoral production. Livestock output from these systems could be improved through interventions to:

- increase cultivated fodder production and stoverage, or improve techniques to preserve existing production
- increase the availability of purchased feed supplements, either manufactured concentrates or hay
- develop agro-forestry for the provision of feed resources which are less susceptible to climatic fluctuation than natural grazing
- maintain fall-back grazing reserves for use in periods of exceptional stress

With the exception of improved supplies of purchased feed supplements, the management improvements suggested here require control by livestock keepers of high potential areas which will respond favourably to intensive management; the development of tenure systems which will promote such control is discussed in a later section of this paper.

Historical precedents for a process of agro-pastoral intensification are provided by North American ranching at the turn of the century, with the introduction of irrigated forage production and mechanized hay making in valley bottoms. In this case, ranch development involved a concentrated investment of labour and capital on small but very productive sites, rather than the dispersal of resources and management over large grazing areas of relatively low potential.

River basin development by or for non-pastoralists and the alienation to farming of high-potential grazing areas may preclude the development of intensive agro-pastoralism in some parts of dry Africa. For these areas, the development of commercial markets in livestock forage may provide the most attractive option.

Potential risks

Imported feed resources permit the maintenance of high livestock populations during droughts, and facilitate rapid post-drought herd growth. The artificial maintenance of high stock numbers may have long-term deleterious effects on the condition of the natural range.

Strategy D—Conservative Stocking

The low stocking rates depicted in Strategy D exemplify the husbandry practices of some freehold commercial ranchers with sufficient capital to forgo immediate profit, and with the legal right to exclude other producers from private ranges.

In terms of access to scarce natural resources, there is a direct conflict of interest between these private land owners and communal area producers on heavily stocked ranges. It has long been appreciated, however, that there is also room for a degree of mutual benefit based on the integration of private ranchers and communal producers into a single system of stratified production. Because they are lightly stocked, commercial ranches provide a possible outlet for the disposal of surplus communal stock in all but the worst droughts. Operating as speculators, finishers and fatteners, private ranchers may bid against traders for surplus communal animals, and help to maintain price stability. By providing a source of cheap immature animals, communal producers may, on the other hand, contribute significantly to the profitable operation of conservatively stocked ranches.

From a national policy perspective, there is a need to maintain a proper balance between the two sectors. Excessive conversion of open range into

private holdings, or the impoverishment of communal producers, will reduce the profitability of commercial ranching operations by eliminating their supply of cheap stock for finishing (White 1992). An efficient and profitable commercial sector may depend, therefore, on close integration with a prosperous and sufficiently large communal sector, a relationship which has sometimes been overlooked in debates about the relative merits of the two husbandry and land tenure systems.

Potential risks

Pastoralists who purchase ranch animals in order to restock after droughts may acquire breeds which are physiologically ill adapted to the more difficult conditions prevailing on open ranges. Likewise, agro-pastoralists may acquire breeds which are not suited for use as draft animals.

Communal producers may incur high risk but receive insufficient profit from the production of immature animals, while commercial ranchers capture, at much reduced risk, all of the value added by fattening and finishing.

Resource Tenure, Key Resources and Grazing Schemes

Workshop participants generally endorsed the need to maintain herd mobility. It was accepted that traditional patterns of herd movement were becoming difficult to sustain as rural populations grew and land pressure exacerbated competition over scarce resources. In particular, livestock keepers were losing their rights of access to key, high production resources which could be occupied and exploited on a continuous basis by non-pastoral populations. Loss of these key resources diminished the capacity of pastoralists to exploit lower-potential, extensive rangelands which could only be used for grazing.

It was argued that pastoral access to key resources could be maintained by giving formal recognition to pastoral land rights. How this might be done was open to considerable debate.

Legal recognition of pastoral tenure rights requires some understanding of customary pastoral tenure systems. Pastoral tenure systems assign rights to variable types of resources—different categories of water points, kinds of arable field sites, transhumance routes, trees, riverine pastures, wet-season pastures, and so on. These different categories of resources are generally not held by a single ownership unit. Arable field sites might be controlled by households, riverine grazing controlled by a small group of co-resident households, water points owned by still larger kinship groupings, while transhumant routes are open to and controlled by tribal or inter-tribal confederations, etc. These tenure systems can be envisaged as a matrix in which rights to different resource categories are partitioned within a hierarchy of different ownership groups ranging from the individual producer up to the largest tribal or ethnic group. Mobility is possible because these ownership groups are not territorially distinct, but possess

overlapping and potentially conflicting rights to different categories of resources in one area.

Traditional interventions in pastoral tenure systems attempt to simplify these systems so that a single ownership/management unit has access to one, and only one, block of territory. This is the logic behind the creation of grazing cells, group ranches or grazing associations, with their clearly defined membership, clearly demarcated land base, and all-embracing management committee. Many workshop participants argued that, with suitable modifications in design, these schemes still provided the best model for pastoral land management programmes. Suggestions for improved scheme design included:

- a more participatory planning process which emphasized consultation with scheme participants
- the use of local land classification systems to identify key resources
- attention to how producers actually used these resources
- and the incorporation of local 'traditional' authorities into formal management committees

Other workshop participants argued that modifications in scheme design were insufficient, and that a more radical departure from current practice was required. According to this view, 'ranch models' of exclusive land tenure were inherently incompatible with the preservation of reciprocal tenure rights and herd mobility. Moreover, ranching models encouraged the introduction of management programmes which were inordinately complex, difficult to enforce, of unproven technical superiority, and expensive to set up. Finally, in Lesotho (Motsami 1992), Nigeria (Awogbade 1992), Botswana (White 1992) and Zimbabwe (Cousins 1992), pastoral involvement in grazing schemes was motivated more by an interest in acquiring exclusive land tenure rights than by any enthusiasm for the schemes' technical recommendations. It was argued that the schemes had to be radically simplified if they were to be broadly extended, and that future programmes should focus on the resource tenure issues which provided the real impetus for scheme acceptance or rejection at the local level.

Key resource or focal point management provided a possible alternative to grazing schemes. In contrast to the ranching model of range tenure and management, focal point management would concentrate development efforts on a few 'key' natural resources, rather than the delineation and management of bounded territories containing a variety of different resources. It would therefore attempt to exploit the structure of existing customary tenure systems which adjust the intensity of management activity and adjust the scope of access rights to reflect the value of the resource being managed.

Key resources were defined as the scarce natural production factors which limited livestock output by controlling livestock numbers or productivity during the most difficult period/s in the production cycle. Which natural resources were key or limiting within a particular production system would be determined by applied research, but could include dry season water, dry season grazing in close proximity to water, crop residues, browse or tree resources, etc., depending on the particular production system under investigation.

Producers who controlled key natural resources would possess a resource base which would permit them to exploit more peripheral resources and exercise *de facto* control over these resources; formal project intervention in the management of these peripheral resources would be a low priority. In essence, focal point management would concentrate attention on those resources which lay at the heart of a production system, and devote much less effort to the clarification of rights to resources which were very abundant, of low or erratic productivity, or geographically extensive and difficult to police. By deemphasizing the need for strict boundary maintenance, focal point management would also permit the continuation of customary tenure arrangements which encourage the shared use of resources which are not in high demand.

Key resources that are in high demand are likely to be a source of conflict between different groups of users. By its very nature, key resource management would be compelled to address issues of resource conflict, and to confront problems of immediate concern to national authorities. Workshop participants noted that conflicts over tenure entitlements were likely to be particularly acute whenever:

- it was impossible to establish a reciprocal or symbiotic relationship between the various parties which use a common resource
- entitlements to key resources were grossly inequitable
- herd movement was irregular and the need for access to a resource was unpredictable
- procedures for settling land disputes were not clearly defined or there existed multiple contradictory channels for resolving such disputes
- the historical rights and duties of owners were ambiguous

Effective focal point management would require the development of techniques for adjudicating, codifying, legalizing and enforcing customary use rights. A detailed examination of the nature of these techniques was not undertaken by the workshop.

PROPOSALS FOR FURTHER WORK ON THE MANAGEMENT OF COMMUNAL AFRICAN RANGELANDS

Available research results and workshop discussions do not, as yet, provide a sufficient basis for recommending detailed changes in range management policy. Consequently, rather than a series of specific recommendations on policy, the workshop endorsed a procedure for addressing outstanding policy issues. This procedure would involve three complementary activities: research, field testing and diffusion of ideas.

Research

Additional research is warranted on both the outstanding ecological/biological and socio-economic dimensions of what might be termed 'opportunistic' rangeland management. In many respects, biological research, which provided the impetus for the current rethinking of range management, is more advanced. Publication in 1992 of the papers from the 1990 Commonwealth Secretariat technical meeting will further publicize this work within the scientific community and draw attention to the policy issues which it raises. The social and economic dimensions of any attempt to reform African range management are less well understood than the ecological issues.

Recommendation

There is a need to convene a small technical meeting on the institutional and administrative aspects of non-equilibrium grazing system management. This meeting would serve as a socio-economic counterpart to the 1990 technical meeting on biological issues, and would be organized along similar lines. Social scientists would be commissioned to prepare a series of topical papers which synthesize current knowledge in areas such as post-drought restocking programmes, current changes in pastoral tenure institutions, livestock marketing systems, the organization of pastoral extension services and grazing associations, and other topics suggested by this workshop. While social scientists would prepare the written papers, biological scientists would be called upon to referee and provide commentary on the papers and discussions.

Recommendation

Work is required to adapt the model presented here to other geographical zones. Consistent with the membership of the Commonwealth and the mandate of the Secretariat, discussions thus far have focused on Anglophone Africa, particularly the SADCC region. Different scientific research traditions, environmental conditions and social and institutional issues may be pertinent in the Sahelian and Sudanic zones of Francophone West Africa. Urgent attention should be

devoted to establishing a dialogue with scientists and administrators in this region, possibly through a series of regional workshops similar to the present workshop.

Field Testing New Approaches

Further research must be supplemented by attempts to implement opportunistic management strategies in the field, under the auspices of national government programmes or donor projects. The workshop suggested some of the directions in which field testing might proceed:

- the development of tracking strategies to encourage herd mobility, facilitate rapid offtake through appropriately designed marketing channels, post-drought restocking and credit programmes
- the development of resource tenure institutions based on existing customary arrangements or a hybridization of formal and customary entitlements, to handle resource tenure issues at the local, regional, national and international levels
- the strengthening of community participation and information exchange among scientists, administrators and pastoralists

It may be opportune to approach sympathetic donors, government or non-government organizations in an attempt to enlist their support and participation in the process of field testing. How this might be done is outlined below.

Diffusion of Ideas

A distinction must be made between general publicity and efforts to influence decision-makers. On the latter front, the following steps were agreed by participants:

- That the Commonwealth Secretariat organize a meeting of senior officers responsible for range and livestock development in the major donor agencies. This meeting would assess donor support for continuing a programme of work on communal range management issues, and help to further define the terms of reference and schedule for this work.
- That the Commonwealth Secretariat present the results of their Communal Rangelands Project at the next regular meeting of the Commonwealth Agricultural Ministers, for their examination and endorsement.

- That the World Bank may wish to convene a technical meeting of field staff from relevant African development projects, to discuss the results of this workshop and to consider the field testing at project level of some of the management interventions which have been proposed.
- That the collected papers from the 1990 Commonwealth Secretariat technical meeting on rangeland ecology, to be published in 1992, should be distributed to relevant national and international research centres.

General diffusion of the material discussed here is essentially a question of networking. There is no need to create new networks. Participants in the workshop represented four institutions (ILCA, ODI, IIED, NOPA) which support different kinds of livestock and range networks. ILCA has particularly strong links to African national agricultural research programmes; ODI's Pastoral Development Network is targeted at policy makers; the IIED Drylands Network membership is particularly strong among extension workers and NGO field staff in West Africa, and the Project for Nomadic Pastoralists in Africa (NOPA) is developing links with local herder groups and pastoral associations. The spread and complementarity of the existing networks should provide sufficient channels of communication. ODI, IIED and NOPA were able to confirm that they were interested in publishing or otherwise disseminating further work on new approaches to rangeland management.

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The complete workshop proceedings, lists of participants and submitted documents, and copies of papers, are available from:

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Livestock numbers

Time

periods of supplementary feeding (strategy C)

ecological carrying capacity

livestock numbers under stocking strategies A—D

A

B

B

C

D

D