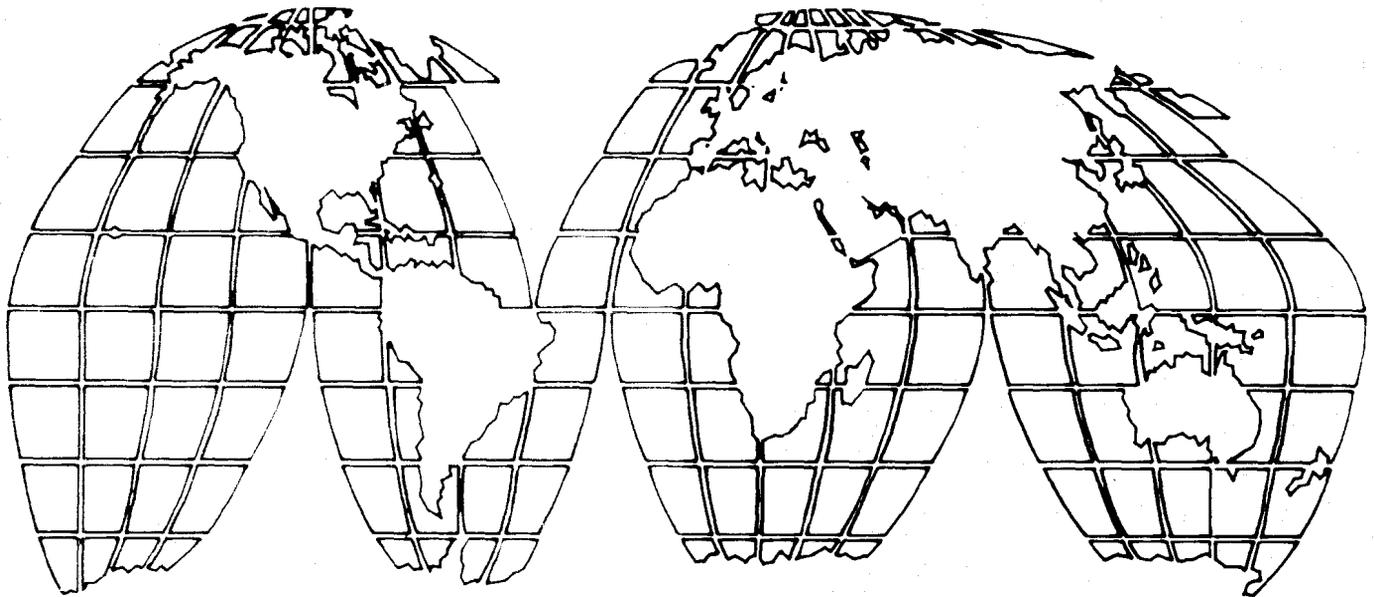


A.I.D. Program Evaluation Report No.4

# **The Workshop on Pastoralism and African Livestock Development**

BEST AVAILABLE



June 1980  
Agency for International Development

BEST AVAILABLE

## A.I.D. EVALUATION PUBLICATIONS

### PROGRAM EVALUATION DISCUSSION PAPERS

- No. 1: Reaching the Rural Poor: Indigenous Health Practitioners Are There Already (March 1979)
- No. 2: New Directions Rural Roads (March 1979)
- No. 3: Rural Electrification: Linkages and Justifications (April 1979)
- No. 4: Policy Directions for Rural Water Supply in Developing Countries (April 1979)
- No. 5: Study of Family Planning Program Effectiveness (April 1979)
- No. 6: The Sociology of Pastoralism and African Livestock Development (May 1979)
- No. 7: Socio-Economic and Environmental Impacts of Low-Volume Rural Roads--A Review of the Literature (February 1980)
- No. 8: Assessing the Impact of Development Projects on Women (May 1980)

### EVALUATION REPORTS

#### PROGRAM EVALUATIONS

- No. 1: Family Planning Program Effectiveness: Report of a Workshop (December 1979)
- No. 2: A.I.D.'s Role in Indonesian Family Planning: A Case Study With General Lessons for Foreign Assistance (December 1979)
- No. 3: Third Evaluation of the Thailand National Family Planning Program (February 1980)
- No. 4: The Workshop on Pastoralism and African Livestock Development (May 1980)

#### PROJECT IMPACT EVALUATIONS

- No. 1: Colombia: Small Farmer Market Access (December 1979)
- No. 2: Kitale Maize: The Limits of Success (December 1979)
- No. 3: The Potable Water Project in Rural Thailand (Forthcoming)
- No. 4: Philippine Small Scale Irrigation (Forthcoming)
- No. 5: Kenya Rural Water Supply: Program, Progress, Prospects (May 1980)

#### SPECIAL STUDIES

- No. 1: Afghanistan Basic Village Health (Forthcoming)

### PROGRAM DESIGN AND EVALUATION METHODS

- Manager's Guide to Data Collection (November 1979)

THE WORKSHOP ON PASTORALISM AND AFRICAN LIVESTOCK DEVELOPMENT

A Report Submitted by the  
INSTITUTE FOR DEVELOPMENT ANTHROPOLOGY

Bureau for Africa

and

Office of Evaluation  
Bureau for Program and Policy Coordination

U.S. Agency for International Development

May 1980

This report was prepared under A.I.D. Contract No. AID/OTR-G-1741, as a summary of the discussions and presentations at the workshop held during September 23-26, 1979. The views and interpretations in the report should not necessarily be attributed to the Agency for International Development or the Institute for Development Anthropology.

The positions advanced in this report emerged from the discussions and presentations at the Workshop on Pastoralism and African Livestock Development and do not necessarily engage the Agency for International Development or the Institute for Development Anthropology.

## ACKNOWLEDGMENTS

It would be difficult to acknowledge all the persons who contributed to the success of the Workshop on Pastoralism and African Livestock Development, but a few individuals must be singled out for special thanks. Mrs. Goler T. Butcher, AA/AFR, not only encouraged the idea of a Workshop but was present at almost all the sessions and chaired several of them. Institute for Development Anthropology staff are enormously grateful for her having taken time from her Washington desk, and for having by her presence underscored the importance of the discussions to AID. Several of Mrs. Butcher's associates, including William H. Johnson, Chief, and Douglas Butchart, Senior Livestock Adviser, AFR/DR/ARD, played central roles in drafting the agenda and identifying participants, as well as taking active parts in the Workshop itself.

The Workshop was co-sponsored by the Bureaus for Africa and Program and Policy Coordination. Mr. Robert J. Berg, AAA/PPC, and his colleagues in the Office of Evaluation, shared with the Institute staff their intellectual commitments to the problems of livestock sector developments, and provided superb administrative backstopping for the Workshop. The Office of Evaluation constitutes a social science center of considerable excellence, and it was a constant pleasure working with them.

A questionnaire (see Appendix III) was distributed to all participants in advance of the Workshop, and the analysis of the answers helped us to focus the agenda on unresolved areas. We are grateful to the many participants who returned the questionnaire and we appreciate the care and detail with which a number of persons responded. Their narrative comments have been very useful. In addition to completing the questionnaire, Professor Douglas Johnson, Clark University, thoughtfully provided us with a summary statement of what he felt had been concluded at the Workshop. We have taken the liberty of incorporating much of that document in this report, although full responsibility for its contents remains, of course, with the Institute.

INSTITUTE FOR DEVELOPMENT ANTHROPOLOGY  
Binghamton, New York

January 1980

## Table of Contents

### Acknowledgments

I. The Conclusions	1
1. Quantitative data relating to pastoral systems are notoriously unreliable	5
2. Management units for development interventions in the livestock sector should be (a) small-scale and (b) based on existing cultural ecological systems	6
3. Various kinds of mobility are both crisis-survival mechanisms and effective strategies for long-term exploitation of the range	7
4. Semi-arid rangelands can experience considerable biological and climatic stress without necessarily resulting in long-term secular degradation, the very identification of which is difficult	8
Previous Page Blank basis on livestock sector interventions at ld be to support the subsistence base of pas- with integrity rather than to stress commercial activities	10
6. Monitoring and evaluation should be made integral components of every program and project in the livestock sector.	11
II. The Discussions	14
1. Range Degradation and Range Productivity	14
2. Program and Project Objectives	16
3. Institution Building	19
4. Marketing	22
5. Case Studies	23
A. SODESP, a Senegalese Project	23
B. Maasai Livestock Project, Tanzania	25
C. Livestock Development in Kenya	29
D. The Evolution of Livestock Projects in Botswana	32
6. Implications for Policy, Programs, and Project Design	34
A. Objectives	34
B. Caveats on Assumptions	35

---

C. Implications for Action	37
D. Areas of Further Study	39

Appendices

- I. Participants
  - II. Agenda
  - III. Participant Questionnaire
-

## I

### THE CONCLUSIONS

The Workshop on Pastoralism and African Livestock Development, co-sponsored by AID's Bureaus for Africa and for Program and Policy Coordination, was inspired by a pervasive though not well-documented sense in the planning community that livestock sector interventions in semi-arid regions had seldom achieved the expectations held for them. During three days in Harpers Ferry, West Virginia, some 80 participants drawn from a variety of countries, organizations, and specializations (see Appendix I) examined the principal social, economic, and environmental assumptions that implicitly and explicitly underlie these interventions. Expert multi-disciplinary consideration of the evidence resulted in an unequivocal confirmation of none of the assumptions and in a clear falsification of several. In three days it was possible only to identify fundamental issues, not to resolve them to everybody's satisfaction. Yet while firm agreements were not reached on the details of many points, there was a consensus that, if they are to have favorable and beneficial impacts on producer populations, national wealth, and environmental conditions, *livestock sector programs and projects must be reoriented to make them more nearly compatible with the social, economic, and*

*environmental realities of arid and semi-arid pastoral regions of Africa.*

The Workshop was an outgrowth of an exercise undertaken by the Studies Division, Office of Evaluation, PPC, to review the state of current knowledge concerning the social and economic impacts of livestock sector projects on low income peoples in a number of African countries. Three papers -- two of which were written specifically for that exercise -- were distributed in advance to Workshop invitees, and served as background materials for the discussions at Harpers Ferry:

D. S. Ferguson, "A conceptual framework for the evaluation of livestock production projects and programs in Sub-Saharan West Africa," Center for Research in Economic Development, University of Michigan, 1979.

A. Hoben, "Lessons from a critical examination of livestock projects in Africa," PPC/E/S, 1979.

M. M. Horowitz, "The sociology of pastoralism and African livestock projects," Program Evaluation Discussion Paper No. 6, PPC/E, 1979.

In discussions between the Africa Bureau's Division of Agriculture and Rural Development (AFR/DR/ARD) and PPC/E/S it was agreed that a broader ventilation of the issues enumerated in these papers would better illuminate the problems and provide some guidance for more efficient design and more effective project implementation and evaluation. Dr. D. W. Butchart, Livestock Specialist, AFR/DR/ARD, outlined the purposes of the Workshop as follows:

- I. To provide AID with policy implementation guidelines concerning whether, where and in what ways to become involved in pastoral livestock projects.
  - A. What are the American's special capabilities as donors in livestock, range and land use projects in the arid and semi-arid ecologic zones of Africa?

- B. How can such projects be made to be technically, socially and financially feasible at a cost that the host country can continue to support after U.S. assistance phases out? i.e., some projects have been criticized for too high costs per beneficiary.
  - C. Do such projects fit AID mandates, target groups, priorities and U.S. interests as well as being within the American's special implementation capabilities?
- II. To provide AID with program guidelines in livestock, range and land use project identification, design and evaluation methodology.
- A. In project identification, what examinations of local site and situation are required? Perhaps development under certain situations may be impossible or undesirable.
  - B. What are the data requirements? Perhaps a resource inventory should include human resources as well as physical resources such as range inventory, land use potential, etc.
  - C. What aspects of host country "policy" and "development" plans need to be examined? How does AID deal with low commitment of some governments to range management actions?
  - D. What is the special developmental timeframe needed for livestock, range and land use projects in pastoral zones?
- III. Problem Identification.
- A. Relevant trends. For example, rangeland area is declining as land is taken out of grazing use for cropping.
  - B. Is the productivity of the rangeland declining? If so, is it from overstocking, shifting cultivation or periodic cyclical drought? Does range vegetation always need periods of deferred grazing to prevent further degradation?
  - C. Does all rangeland have a vegetative capacity to recover if rested? Is the productivity of the rangelands declining?
  - D. The tonnage of meat marketed from the Sahel countries has continued to increase each year for the last few years. Is it true that the Sahel pastoralist is mining the future through the over exploitive use of range resources?
  - E. The livestock population in the pastoral zones of Africa is increasing overall but is decreasing in some locations and static in others. What is the significance of the wide variations of herd size due to disease problems and drought?

- F. Since diversity is the rule and not the exception in Africa, due to wide differences in rainfall patterns, soil types, vegetative cover and diverse ethnic groups of people, what can be generalized about pastoral livestock production?
- G. Is desertification occurring? If so, where? Is it a crisis situation? What are the causes? Can cause be attributed to categories of land uses? To what extent are pastoralists contributing to the degradation and are therefore part of the problem. If a solution is possible, who would benefit and who would lose in the process? Should pastoralists be protected and isolated from change? What changes have occurred in intergroup relationships affecting the pastoralists in recent years . . . ("Thoughts on the purposes of the Workshop on Pastoralism and African Livestock Development . . .," September 20, 1979)?

Since the sessions formed a workshop rather than a conference, no formal papers were presented and no attempt was made by those present to deal exhaustively with Butchart's list of problematics, although most of the issues were considered (see Appendix II, Workshop Agenda, for an itemization of discussion topics). The emphasis was on discussion and in particular on sensitization of the AID participants to those problems which relate directly to project and program design, implementation, and evaluation. It is interesting to note that while there were differences on specific points, these differences did not divide neatly along disciplinary lines, and at no time did all biological scientists find themselves aligned against all social scientists. (This lack of disciplinary polarization may, in part, be due to the avowedly ecological point of view manifested by most participants eclectically bridging the biological and sociological arenas.) There was some tendency for individuals to generalize from particular experiences, so that persons whose fieldwork was done in the Sahel saw things somewhat differently from those who had worked mainly in East Africa. Economists who worked in different areas argued over price responsiveness of herders;

animal scientists and veterinarians disagreed among themselves on the feasibility of marked increases in offtake; range scientists differed on the nature, intensity, and indeed on the very definition of environmental degradation. Despite the many differences, some of which were substantive and some definitional, there was enough of a consensus on major points of fact and of strategy to permit us to generate a set of principles which may serve as tentative guides for action.

1. Quantitative data relating to pastoral systems (including human populations, herd demography, biotic composition) are notoriously unreliable.

There are two reasons for this:

a. Arid and semi-arid regions experience considerable instability (which is not synonymous with fragility), and they are subject to a complex series of cyclical events. Data gathered at a particular time or locale tell us little about events over time and in other places, and even longitudinal data from the same place require great caution in interpretation.

b. Data gathering techniques are insufficiently standardized to encourage comparability.

Workshop participant Stephen Sandford of the Overseas Development Institute has written tellingly on this point:

Existing data, about the present and past, are almost totally useless. Unless some (prior) attempt is made to consider the relative importance and incidence of trend, cycle, seasonality and random variation, the knowledge that the cattle population was X thousand on 1/1/1930 and 3X thousand on 6/6/1960 *should* lead to absolutely no conclusions at all. The same is true for grass cover. Superimposed on this problem is the fact that techniques, for counting and measuring, change between different surveys, as do the background conditions of public security and efficiency of administration ("Situations and trends with pastoral people and livestock," MS).

The errors which proceed from these weaknesses in the data can lead to substantially flawed project design. For example, a major multilateral donor appraised a project calling for the establishment of pastoral units. The appraisal mission was in the field during the latter part of the dry season. Noting neither people nor animals on a vast expanse of range, the team concluded that the land was not employed for grazing because it lacked permanent watering points, and recommended that wells be dug. The mission's error was in projecting across the year the vacancy of May, without understanding the cyclical nature of transhumance. In the rainy season, that same "unoccupied" land is the prime pasture for large numbers of animals who slake their thirst with the abundant ground waters that accumulate in natural depressions and last well into the dry season.

Unless one is certain that the various periodicities which impinge on the data are taken account of, a prudent skepticism should confront figures which purport to describe stocking rates, offtake, milk yields, herd numbers and composition, and the like.

2. Management units for development interventions in the livestock sector should be (a) small-scale and (b) based on existing cultural ecological systems. Although it is appreciated that the objective of reducing project proliferation and the number of management units by developing projects of larger average size is attractive, it must nonetheless be noted that a recurrent cause of project difficulty in the pastoral livestock sector is the establishment of managerial units which are too large, in which decision-making is centralized and remote from individual herd managers, and which are designed along arbitrarily chosen geometric boundaries or animal/people numbers. Since the vast bulk of decision-making regarding the movements

and offtake of herds is vested, within the parameters of local range use agreements, in individual herd managers, and that vesting is a function of the microecological context within which the herders must act, projects which pre-empt such decision-making will be strongly resisted. The project focus should be on providing the herders with the means for a better processing of microecological information so that they can make more effective decisions. Since such information is highly variable over time and space, its value and relevance are greater where it pertains to a relatively small arena.

3. Various kinds of mobility are both crisis-survival mechanisms and effective strategies for long-term exploitation of the range. Normal transhumant movements provide for a continuous replenishment of nutritious herbage, water, and avoidance of fly-borne and tick-borne diseases. Migration -- sudden, long-distance movement -- is a survival response to drought or epidemic (or, in pre-colonial times, war). There is substantial evidence that the greater the physical mobility of the population, the better it was able to withstand the ravages of the 1968-1974 Sahelian drought (J.P. Hervouet, "Stratégies d'adaptation différenciées à une crise climatique. L'exemple des éleveurs agriculteurs du Centre-Sud mauritanien. 1969-1974," in J. Gallais, ed., Stratégies Pastorales et Agricoles des Sahéliens durant la Sécheresse 1969-1974. Bordeaux, 1977). Despite the obvious ease of delivering health, educational, and veterinary services to a sedentary population, planners should recognize the fundamental ecological importance of the repertory of movements to the pastoral herding enterprise. Interventions which incorporate these movements in their design are preferable to those which require sedentarization. With a handful of possible exceptions, this is borne out by the exceptionally poor performance of

ranching schemes. The challenge to planners is to find ways of delivering quality-of-life services to mobile populations without unduly constraining pastoral coping mechanisms.

4. Semi-arid rangelands can experience considerable biological and climatic stress without necessarily resulting in long-term secular degradation, the very identification of which is difficult. Range ecologists and agrostologists argue that to distinguish true desertification from temporary declines in production and temporary changes in species composition due primarily to several years of below average rainfall requires the accumulation of evidence over a long period.

Only over periods greater than a decade can desertification be clearly distinguished from the less lasting effects of drought (A. Warren and J. K. Maizels, "Ecological change and desertification," U.N. Conference on Desertification, Paper No. A/CONF. 74/7, 1977).

Even long-term change should not casually be equated with degradation. The shift, for example, from a long-grass to a short-grass cover does not mean that either the useful nutrient content of the range or its capacity to sustain a certain stocking rate has declined. Semi-arid ecosystems are dynamic, and there is no solid body of evidence to support the accusation that pastoral exploitation including common access to the range is inherently deleterious. While the recent Sahelian drought has properly sensitized planners to environmental issues, it is important that they not predicate interventions on what may be false assumptions about the destructive effects of open range grazing. Such degradation as has been identified and attributable to human action is mainly along the interface between the pastoral and agricultural zones, particularly where farming has migrated into low rainfall areas and subjects a thin soil to the trauma of cultivation; degradation also appears in immediate proximity to the deep bore wells installed by the donors, which effectively abrogated existing range-use

agreements.

Searching for a single, uniform explanation of what will prove to be a complex environmental change, commentators seem often to favor either an exclusively "natural" or an exclusively "human" cause. This tendency is not unique to considerations of the African range. In their discussions of gullying in California and Arizona, Cooke and Reeves note that scholars seldom acknowledge that similar events may have quite discrepant causes:

. . . there is a certain correlation between the professional interests of investigators and the conclusions they reach on the causes of arroyo cutting. Agriculturalists, foresters, and conservationists commonly indict man for his excesses. In contrast, some geologists, palaeobotanists, and archaeologists have sought and found 'natural' explanations. Such partiality is, perhaps, a measure of the luxury permitted by incomplete historical evidence. (R. U. Cooke and R. W. Reeves, Arroyos and Environmental Change in the American South-West. London: Oxford University Press, 1976, p.6).

The fact is that, where geomorphological conditions allow, gulleys can be due either to markedly increased precipitation leading to sudden increases in flow against erodible materials as occurs periodically in semi-arid regions (like the period of greater than average precipitation in the Sahel during the 1940's, when the 100mm isohyet migrated some 650km northward against the desert, and created an entire new region for grazing [E. Bernus and G. Savonnet, "Les problèmes de la sécheresse dans l'Afrique de l'ouest," *Présence Africaine* 88(4): 113-138, 1973]), or to decreases in vegetation caused by overgrazing, or both. If the relevant cause is not identified, the treatment proposed will not only not cure the effect, but will create bewilderment, dismay, and alienation on the part of the local, supposedly beneficiary population, which is being asked -- or required -- to make inappropriate changes in their exploitative behavior. It is not a simple

thing to disaggregate the cause or causes of a problem which affects human action, and the tempo of a development calendar rarely allows for an analysis with which all will agree. But the consequences of false analysis are so great, that every effort should be made to reach an adequate understanding.

5. The prime emphasis on livestock sector interventions at this time should be to support the subsistence base of pastoral herding rather than to stress commercial activities. In other words, the prime beneficiary of interventions in the livestock sector should be the herding or producer population rather than the urban consumer population. This is not to deny the validity of national needs, nor to denigrate the pressures to increase the contribution of herding to the national wealth. But such contributions will not be assured on a sustained basis until the pastoral producers themselves enjoy a reasonably secure subsistence base. Schemes for zonal stratification (in which young stock is removed from the pastoral zone for fattening in the intermediate rainfall area and consumption in the cities) and increased offtake are unlikely to be met with producer enthusiasm unless the latter are guaranteed economic security. The various schemes which the Workshop examined which involve increased offtake and the shift in emphasis from dairy to beef production remove the value added to the meat in improved fattening operations from the producer and transfer it to either the intermediaries in the form of middleman profits and/or to the consumer in the form of lower prices.\* There is little incentive for the herder to offer young stock for sale in this kind of operation. Since pastoral herdsmen have shown considerable responsiveness to commercial opportunities *which they themselves define as beneficial* (to wit the steady provisioning of domestic and export markets in the absence of coercive sanctions), one can be optimistic about the long-term sustainable benefits to the national wealth from an initial

---

\* There are occasions, however, when pastoralists do seem to profit from fattening operations carried out by non-pastoralists (see C. Wardle, Promoting Cattle Fattening among Peasants in Niger, Pastoral Network Paper 8c, Overseas Development Institute, July 1979).

support for subsistence activities, particularly for dairying. In this light it is worth noting that veterinary interventions have enjoyed, by and large, the best assessment of all donor activities in the livestock sector. Veterinary actions lend themselves to sector-wide application, and need not be bound to a project-by-project approach. The integration of veterinary with project-specific activities would facilitate agreements with herders that any increase in the offtake numbers would come from a decrease in infant calf mortality. Focusing veterinary concern on the problem of calf mortality should achieve a substantial improvement in relationship with herders.

6. Monitoring and evaluation should be made integral components of every program and project in the livestock sector. This means that the basic responsibility for regular monitoring and periodic evaluation should be vested in the project management and especially in the beneficiary population (since the latter are most sensitive to project-induced changes in resources), and by so doing increase host-country analytical and managerial capacities. This point was emphasized especially by a number of the African participants who felt that selecting a few projects scattered across the continent for intensive monitoring was unlikely to yield the kinds of information needed for improvement at the local level. While they did not specifically object to such selected, isolated monitoring, they were concerned that it not pre-empt the field. They felt that monitoring and evaluation should be considered fundamental components of the project, as important as the technical package itself. It was also felt that institutionalizing evaluation within the project (although keeping it separate from the extension function in order not to confound project assessment with merchandising) would reduce the strain and

demands on staff time from frequent visits by outside evaluators who seldom have any close familiarity with the project.

\* \* \*

As an AID officer noted some years ago while wrestling with the problem of defining a strategy for livestock sector interventions in the Sahel, there are "no easy answers" (H. Helman, "Cattle production in West Africa -- no easy answers for the new enthusiasts," 1972). It is not difficult to identify faulty assumptions and erroneous facts in project papers; but it is not easy to design a project that will concurrently satisfy all major objectives:

- improve the income and well-being of pastoral herders;
- increase the supply of meat available for export;
- satisfy domestic urban demands for low cost meat;
- retard or reverse environmental degradation.

Clearly there is a potential disharmony among these objectives, and a need for prioritization among them. We have recommended, on the basis of Workshop discussions and the various evidence presented, that emphasis at this time be placed on the first of these objectives, and we further suggest that that would be best achieved by focusing interventions on the ability of herders to support themselves via the pastoral enterprise. To design projects which satisfy this objective -- and provide, thereby, the basis for the subsequent satisfaction of the other objectives -- it will be necessary to involve herder participation in project identification, design, implementation, and evaluation to a degree far greater than is currently customary. It will, in other words, require a substantial discontinuity in the traditional behavior of development planners. We do not

underestimate the tenacity with which many of the latter will cling to their tradition. Innovation calls for a modicum of courage, a willingness to depart from the security of the tried (if not of the true). We believe the risk is worth taking.

## THE DISCUSSIONS

This section outlines the Workshop discussions. Most of the formal sessions were recorded, and persons interested in the detailed statements are welcome to consult the tapes in the Institute library. The printed outlines which follow are faithful to the substance of the debates, but a good deal of their tone is clearly missing. In the interests of coherence we have tried to deal with single or closely related topics in the report, although the discussions themselves often tended to refer backwards and forwards to other issues.

1. Range Degradation and Range Productivity. While this topic generated a good deal of discussion and some controversy, it was felt that narrowing the arena of disagreement was important because the assumption of degradation is so pervasive in livestock sector development thinking. The following issues were examined at length: What is meant by range degradation? How can long-term degradation be distinguished from short-term changes which affect production negatively and from long-term changes which either do not diminish or which actually enhance the productive potential of the range? Is range degradation general throughout the arid and semi-arid pastoral zone or is it discontinuous and localized, associated with specific micro-ecological environments? Where degradation is identified, is it irreversible? If it is reversible, is the duration of damage necessarily long-term?

While no one would argue that there were no cases of true range degradation, that is, of a clear reduction in the capacity of the range to produce crops which were palatable to livestock, the general sense was that the Sahelian range itself has not been degraded by grazing per se. Degradation appears to

be discontinuous, concentrated at deep bore holes (although some scientists question the evidence), where excessively large numbers of animals congregate, and at the interface between the pastoral and agricultural zones, where rain-fed cereals cultivation migrates into the lower rainfall regions. In the pastoral zones, overgrazing seems to victimize the animals more than the environment, which is claimed to have considerable resiliency, an ability to re-seed its annual grasses quickly when the stocking pressure is reduced. The current sensitivity to environmental issues is largely a reaction to the animal losses from the long drought of 1968-74, but there is very little evidence of widespread decline in productive capacity which can be attributed to events other than climatic.

Some participants suggested that the succession of plant cover may actually indicate an improvement in the range, an increase in the volume of meat per unit land. Although most discussants did not identify themselves with this optimistic position, the majority felt that before final conclusions which influence development policy are made, it is necessary to elaborate a series of measures of range productivity which differentiate between natural and socio-economic causes, and which are situationally specific. It was felt that specific localized areas are sufficiently different one from the next to render premature any broad generalizations about "the pastoral range": each project area needs its own detailed agrostological and ecological inventory and analysis to provide guidance for an appropriate development strategy.

The issue of environmental degradation is enormously important and merits the concern it has recently received. That concern should now be translated into scientific investigation. The greatest error would be to rush into a series of actions predicated on the unsubstantiated assumption of widespread, herder-induced degradation.

2. Program and Project Objectives. No developing country is internally homogeneous in relationship to wealth and power. In the poorest countries and in many of the poorest rural villages there are some individuals who benefit from existing conditions more than others, and who will attempt to influence the direction of change to maintain their privileged position. From a distance, such privilege may not look like much, but it is often determinedly defended. It is a rare project which incorporates a recognition of that economic and political differentiation into its design. In pastoral livestock sector projects the identification of objectives is critical, because the various objectives which have been elaborated tend to have different beneficiary populations. Competition for control over the project, particularly between representatives of government and representatives of the producer groups, illuminates the problem. In the formal arena, the government (i.e., the livestock service or a marketing board) "wins," but herders are a paradigm case of populations that vote with their feet. The current West African vogue for zonal stratification, for removing young male stock from the lower rainfall regions to fatten in the intermediate zone and be consumed either in the cities or in foreign countries, exemplifies the triumph of the urban, often governmental segment of the population over the producers. While this taxation of the rural majority to support the urban minority (via monopsonistic government pricing of agricultural produce to favor the latter) affects the entire rural population, it tends to be exacerbated with herdsmen who are typically members of ethnic groups with only marginal access to political power and often with histories of hostile relationships with those groups which have far better access. (This is less true in Somalia and Mauritania than elsewhere in Africa.) The reluctant and often unwilling participation of herders in livestock schemes was attributed frequently to their assessment of the scheme's benefitting some other segment of the society.

With the prominent exceptions of veterinary programs and the early implantation of deep wells in remote pastoral regions, sector projects have almost invariably focused on increased production of beef. During the colonial and early independence periods, ranching schemes were common, especially though not exclusively in countries under British domination and influence. Herdsmen voted with their feet (and cattle with their hooves) by withdrawing from these projects in great numbers. At the same time, donors and governments have shown their preference for farming over herding by encouraging the expansion of agriculture into some of the best African rangelands. In the Butana of the Eastern Sudan, for example, a progressive series of irrigated schemes whose expansion was made possible by the Sudanese increasing their harvest of Nile waters following the Aswan agreements, has denied herdsmen dry season pasture along the 'Atbara and other rivers and substantially contracted their available pasture. To the injury of herders being forced in large numbers onto increasingly marginal lands, is added the insult of being accused of overgrazing the common resource and degrading the environment!

In addition to historic hostility between government and herders, now phrased in a language which bemoans the lack of health and educational facilities for herders (although the non-extension of these facilities was a decision made by governments and donors), the very centralization of authority and top-down development inherited by most African governments from their colonial rulers may be peculiarly inappropriate to the pastoral sector, where individual herd managers and leaders of very small groups (called fractions in the French literature) make their own judgments regarding the welfare, movements, and offtake of herds. We do not underestimate the

difficulty for governments to make the ideological commitment to decentralized authority, however functionally and ecologically appropriate it may be for them to do so.

Even where a government (and the donor agency) is interested in enlarging the beneficiary population of a livestock project to include the pastoral producers and to form a coalition of interest groups in support of an intervention, the problem is that the herders generally do not have an institutional advocate. It is difficult structurally for them to participate in a coalition to promote their own interests because they tend to lack adequate representation. It was pointed out that the partial success of an East African project was attributable to the senior governmental position achieved by a member of the community who was able to exert influence on the administration to make decisions favoring the herders. Where pastoralists appear as political constituencies, they are better able to mold interventions to their own benefit. An important component of program and project design, then is to identify ways of more effectively involving the herders in management (recognizing, of course, that herders may themselves be internally segmented). This is, of course, a political rather than a technical event. The fact that a project anticipates the creation of pastoral associations does not in itself imply a sharing of management with the herders, for the pastoral associations may be little more than efficient means for conveying managerial decisions to a large number of persons. Pastoral associations will imply managerial participation on the part of the producers where these associations have the authority to make genuine decisions about animal movements, use of range and water, offtake rates, sale prices, and the like.

It was felt by a number of participants that the priority objective for development at this time should be the reinforcement of the pastoral subsistence base, to provide the herding populations with surer means of

sustaining themselves. While recognizing the claims of the domestic urban populations for low cost meat and the needs of the state to improve foreign exchange positions by increased exports of livestock and livestock products, it was argued that the sequencing of action should focus first on improvement of subsistence, income, and quality of life of herders via ecologically sound interventions. Since it is not clear just what interventions are "ecologically sound" -- although there was general agreement on the inappropriateness of a direct transfer of Western range management procedures -- it is essential that they be based on localized, in depth analyses undertaken collaboratively by biological and social scientists working collegially with the local populations.

3. Institution Building. There was general agreement on the need for thorough institution building and personnel training at all levels of livestock programming and projects. In most of the Francophone countries, the livestock service has been almost exclusively oriented to veterinary medicine, although there are some recent developments, such as in Mali, where a broader ecological approach combining animal science with agrostology has emerged. In Mali also there is the beginning of a sociological capacity at OMBEVI, the Office for Livestock and Meat. The Anglophone countries have a tradition of range science which emerged from their early experiments with ranching. In almost all countries, extension appeared as a weak or the weakest component of the livestock service.

The top-down approach to development, in which the extension agent's task is to convey managerial instructions to the local population, runs into serious cost effectiveness problems in livestock projects, because of the very low density of the herding population in semi-arid lands and

because of their frequent movement. Herder training centers have been proposed as an economical way of reaching large numbers of herders, but no evaluation of these centers was presented at the Workshop. There was some feeling, however, that the extension function had to be better adapted to the transhumant nature of the pastoral enterprise, and this meant that extension agents -- and even veterinary assistants -- should be members of the herder community itself. The village health worker or "barefoot doctor" approach in public health programs provides an interesting model. Pastoral groups can nominate individuals for special training who would then share the new information within the community. At least one member of every Maasai boma today has the necessary equipment and is capable of administering bovine vaccines.

The involvement of community members as extension/veterinary agents is economically attractive and reduces the potential for friction when, as is often the case, extension agents are chosen from among the sedentary populations. (This is not so much a matter of intentional favoritism as it is of selecting persons who have had a certain minimum education.) Local persons not only have the basic linguistic competence to work effectively -- herders and farmers often speak each others' language imperfectly -- but also share essential ethnoveterinary and ethnobotanical perceptions.

It was noted that extension agents -- and not only in pastoral projects -- are frequently forced into role conflict situations, and these interfere with their basic educational functions. If effective extension work requires a high degree of confidence between the agents and the local population, that confidence is threatened where the agents also have police functions. A relationship based on persuasion is of an entirely different character from one based on coercion. Similarly, it is awkward for extension agents to undertake basic research, as there is again conflict between the objectivity

required for research and the commitment to a set of actions which are to be extended to the local community.

Ideally, the extension agent should serve as a two-way conduit for information. S/he should as well be able to communicate from the local group to project management as from the latter to the former. Project commitment will be enhanced where the local population is able not only to participate in initial design but also to fine-tune the project as needed from time to time. Some of the most interesting and instructive of the current generation of livestock sector projects are those which optimize the involvement of local populations at every point. The hema project in Syria was mentioned as one which was able to increase range productivity by returning to the traditional pasture management system that had been abrogated by the government as incompatible with its desire for totally free access to common resources. Mention was also made of the adaptation of existing institutions in Mongolia and Somalia to new situations. The key term is adaptation. No one suggested that existing institutions should be preserved in fossilized form; rather, before imposing a totally new organization on local population, examination should be made of existing structures to determine their suitability to play managerial roles in the new project or program.

Finally, it was felt that the training of extension and other livestock service workers should reflect the broad ecological approach which recognizes the relevance of biological and socio-economic factors. Most of the training programs today are continuous with those of the former colonial countries, in which veterinary medicine is considered separately from environmental issues, and both of these ignore the social, political, cultural, and economic contexts within which herders operate. There is an enormous opportunity for a new approach to training which would be focused to deal with the special conditions of African pastoralism rather than simply replicating a curriculum that emerged to deal with problems elsewhere.

4. Marketing. The success record for livestock marketing interventions, even in terms of meeting their own explicit goals, has been frail. Many of the early marketing projects focused on slaughter houses, which almost invariably operated substantially below capacity and therefore at unsustainably high costs. There were problems with supply, for herders were unwilling to provide livestock in sufficient quantity. And there were problems of demand, for importing countries tended to prefer buying animals on the hoof (and profiting from the hides as well) than to buying carcass, Where supplies were inadequate herdsman were accused of economic irrationality, of seeing animals as symbols of wealth rather than converting them --through sale for cash -- into other values. The assertion that pastoralists are unresponsive to the market, and a certain impatience with social analysis, predisposes planners both in government and in the donor agencies to pressure herders to behave more "rationally" and to make a greater contribution to the national welfare.

Workshop discussion focused on two issues relating to the number of market presentations herders make: (1) Can this number be increased markedly without impacting adversely on the reproductive capacity of the herd and its ability to sustain a large pastoral population? (2) Are herders price responsive? Neither question was resolved. One animal scientist, with extensive experience in both East and West Africa, argued that current offtake rates can be increased only if there is a sharp decline in calf mortality. He felt that the demographic structure of the herd and its primary function to support a large number of persons made it unlikely that much more young stock could be culled under current circumstances. He estimated pastoral offtake at from about 8 percent to about 12 percent, although no one was ready to insist that these figures had much precision. Another animal scientist claimed on the contrary that a particular herding group in East

Africa had, on its own initiative, almost doubled its offtake to about 20 percent. The director of the Senegalese SODESP project stated that participating herders who are offered a premium price for yearling calves achieved a 32 - 33 percent offtake at that age, and that even non-participating herders harvest about 25 percent of their yearling calves. Data from Botswana showed a great increase in the numbers of animals harvested yearly, but since the total herd size has also grown it was difficult to determine if the percentage yield had increased.

Although the number of market presentations may not vary directly with price in all parts of Africa there is substantial evidence that offtake is price responsive. The so-called backward bending supply curve is not itself an indication of irrational or non-economic behavior, since an individual may be able to meet his immediate economic needs with a target level of income and better satisfy his other needs through the direct circulation of cattle. Clearly, in a highly inflationary situation, a rational strategy calls for retaining animals until the last possible moment. One participant remarked that retaining a six year old steer for several more years is a rational investment, like buying gold: its value continues to rise even though it is nonproductive.

5. Case Studies. In this section we shall summarize the reports which were presented on several livestock sector development projects from different parts of Africa.

A. SODESP, a Senegalese Project. A parastatal organization, SODESP began with FED funding in 1975 with the goal of reducing and ultimately eliminating national dependence on imported meat and dairy produce. Located in the sylvopastoral zone of north central Senegal,

SODESP is organized in five discrete autonomous production regions, each centered about a deep bore well and containing a growing-out and a fattening unit. In 1978 it entered a new phase of expansion, and is soliciting further donor support.

The technical package consists mainly of improved veterinary services, periodic supplemental feeding, and limitation of cattle to the carrying capacity of the range. The aim is to transform the traditional pastoral herding activity, which retains large numbers of adult males, to a cow/calf operation in which young male stock are removed from the herd as soon as feasible. Herders who voluntarily participate in the program are paid a guaranteed price for calves which is somewhat higher than the free market price. The SODESP provides for transportation, fattening, finishing, slaughter, processing, and distribution of the meat to consumers.

According to its Director General, SODESP accomplishments even at this early date have been impressive:

- (1) 214 herders have enrolled 7,500 head of cattle in the program.
- (2) Offtake of fattened cattle is 1,500 head per year.
- (3) Annual calf crop has risen to 65 percent.
- (4) Heifer age at first calving has been reduced to 3 years.
- (5) Calf weight at weaning has increased to 150 kilograms.
- (6) Calf weight at birth has increased to 21 kilograms.
- (7) 5,000 head of cattle have entered growing-out centers.

SODESP is not satisfied with these accomplishments, and hopes to increase its operation as follows and become entirely self-supporting (that is, without government subsidy):

- (1) To have 100,000 animals in the program.
- (2) To produce a 400 kilogram live weight animal in 3 1/2 to 4 years from birth.
- (3) To market 30,000 animal units annually.

SODESP believes that it has adequately faced the issue of herder incentives to participate by providing a desired package of inputs (improved watering points, veterinary services, supplementary feed) and by offering a price for immature stock above that paid in the open market. They further point to the voluntary nature of the contract between the herder and the organization, which allows the former the right to disassociate himself from the program.

There was a good deal of discussion during this presentation. Some participants felt that the various calculations presented were based on the assumption of at least normal rainfall, and they wondered what actions were to be taken in the event of a run of rainfall-deficit years. How will SODESP prevent the disastrous over concentration of livestock around the bore holes -- as occurred during the last great drought -- when pasturage declines in other areas? There were also questions raised about the watering rights of nonmember herders when the number of SODESP cattle reaches the calculated carrying capacity of the range which encircles the wells.

B. Maasai Livestock Project, Tanzania. Located on a 24,000 square mile tract in the Arusha Region of northern Tanzania, the project owed its creation to Government of Tanzania initiatives beginning in 1965. At that time, a range commission was activated to oversee the gazetting of Maasai District and to promote the formation of ranching associations by its residents, with the objectives of better management of the range and increased production of meat. AID involvement started in 1970-1971

when five U. S. technicians were assigned to the project.

By 1976 there were eight ranching associations each composed of about 600 families who elected the management committees. The member families had joint and exclusive access to the grazing land which ranged from between 300,000 to 500,000 acres. The management committees were authorized to impose taxes on the members, and to make investments in equipment and supplies. Several features were unique at the time, and contrast with many other range improvement/beef production projects:

- (1) The 1964 Range Act gave a legal structure to the associations and provided a basis in law for enforcing stocking quotas.
- (2) The technical assistance team was multidisciplinary, and included a sociologist.
- (3) All of the cattle owners in the region were involved in the project.

The former USAID manager outlined what he felt were the problems, accomplishments, and lessons to be learned from the project.

Lessons learned:

- (a) Legal mechanisms, properly enacted, may prove very difficult to apply on the ground.
- (b) Each of the major participating entities in the project -- donors, host government, local officials, beneficiaries, technical assistance team -- have different objectives, and these differences can result in major problems and serious delays in project work.
- (c) The effectiveness of the project was frequently compromised by a change of personnel and a shift in policy objectives.

- (d) It is difficult for the various technicians involved -- animal health specialists, hydrogeologists, sociologists, agrostologists -- to schedule their work to a common calendar and therefore, it is difficult to maintain coordination among activities.
- (e) The early years of the project were consumed largely in infrastructural construction not directly related to meeting the needs of the beneficiary population, and therefore raising the problem of maintaining their interest. Throughout the project, construction problems continued to consume a great deal of senior staff attention.
- (f) During the early years of the project it was poorly articulated with the Tanzanian administrative structure, and this led to difficulties and delays in receiving official authorization for actions and even necessary supplies.
- (g) The cost of data gathering for donor and government reporting was exceptionally high; at least one-third of team time was devoted to responding to requests for information.
- (h) The project began to be viewed by donors and the Tanzanian Government as a success, and in that perception was the potential for failure. There was a constant attempt to link additional components on to the project, and this was a great source of difficulty to the management in the later years. The scope of these added projects -- many of which were worthy in their own right -- exceeded the capacity of management adequately to administer them. Far from achieving economies of scale, these additions were very costly, and the donors should have been more prudent and allowed the original project to operate at an appropriate

scale.

- (i) There is no miracle technology in the livestock production field -- no super cow. The only formula is intensive work with the people at the local level. Benefits will be slow and incremental, not spectacular, and both donors and governments will have to show a good deal of patience with these efforts. The payoffs can be positive, but long-time in coming.

Project accomplishments:

- (a) By 1978, when the ranching associations were phased out, the project was able to function normally within the Tanzanian administrative structure.
- (b) Sufficient acreage had been assigned to each association, and Maasai support for the ranching associations was strong.
- (c) Perhaps the most important long-term contribution of the project was the creation of a cadre of local personnel with technical skills.
- (d) The infrastructure created by the projects -- roads, public buildings -- which consumed so much time during the early years, remain available for local use.
- (e) The project convinced the Tanzanian Government that the approach to village development among herding peoples could not simply be copied from the organization of ujamaa villages among sedentary cultivators. A culturally and ecologically appropriate structure had to be identified which was different from that in place among farmers.

Herder motivation to participate in the project had a good deal to do with the administrative and ideological structure of Tanzania, for the government has made educational, health, and other facilities

available on the basis of membership in some form of cooperative organization. Such local objectives as acquiring dependable, year-round watering points were achieved in combining with other herders in a ranching association. The local objections to the project focused on its emphasis on promoting meat production at the perceived expense of dairy production. Maasai women saw themselves threatened by economic disenfranchisement, for they attribute their economic power and personal autonomy to their control over the allocation of milk and dairy produce. Furthermore, there are potential nutritional consequences as the amount of milk consumed by calves (in a beef-oriented enterprise) increases and that consumed by the herding population necessarily declines. It is conceivable that the increased income received from the beef-oriented enterprise will enable the herders to purchase additional nutritious foods, but this assumes that the terms of trade do not unduly discriminate against them. [The field evaluation of Maasai Range and Livestock Project was being undertaken simultaneously with the Workshop, and its findings were therefore not available to the participants.]

The Finnish-Tanzanian Baraguyu Research Project, which was presented briefly, reinforced a number of the observations made during the discussion of Maasai Range and Livestock, and in particular the resistance manifested by herders to the ujamaa villagization program. The attempt was made to create an appropriately pastoral form of ujamaa village, but only 90,000 acres were allocated to it, of which two-thirds were in a tse-tse infested region. There was also some discussion of the special problems faced by a *research* as opposed to a *development* project, and of the tensions which are likely to occur when a development effort is the subject of study by an independent group that is not necessarily committed to the development project goals.

C. Livestock Development in Kenya. Two different approaches to pastoral projects in Kenya were examined: the Group Ranch Project and the Range Program. In the former program, Maasai herders were granted freehold tenure to pasture. The planners saw in this action a means of transforming the pastoral production system based on open access to pasture into one in which groups of herders would be responsible for specific areas of pasture or "ranches." The Maasai also favored the granting of freehold tenure, but to them it was a measure to restrict further encroachment by sedentary cultivators on the rangeland. Thus there was a coalition of interest on the means of the project but not on the ends which are to be achieved.

The creation of group ranches composed of persons with freehold tenure to the range led to a number of problems. It was hoped that the freehold land would serve as collateral for loans with which the group ranches might be financed, but it proved politically untenable for these mortgages to be foreclosed and their owners evicted for default. Consequently, there was little debt repayment and loan funds to group ranches ceased to be available. Furthermore, the 60 percent majority required for decisions on important matters meant that minority coalitions could form to block group action. The ultimate danger, however, is that freeholders will alienate individual portions of the ranch. While this has not yet occurred, it is a clear possibility, and the loss of a significant segment of the total range would compromise the ability of the ranch to survive. Pastoral herding in low rainfall regions requires a very large territory within which the animals may graze. Pastoralists must have assured access to enormous tracts of land; if these are not provided within the project they will have to find them elsewhere. The

viability of the Maasai project in Tanzania is supported by land units large enough -- 300,000 - 500,000 acres (see p. 26) -- to provide adequate grazing for the members of a ranching association. Should Kenya Maasai be prevented from herding their animals on former group ranch pieces which have been sold off, the results could be disastrous.

The Range Program in the North-East Province of Kenya began in 1969. Environmental conditions do not favor group ranches in that region, because precipitation is so low that constraining animal movement within even huge tracts of land is not feasible. The Program's objective is to funnel immature cattle from the region into national meat marketing channels. The hope was that new rangelands could be opened with the provision of watering facilities. Droughts are recurrent in that area, and lead to high fluctuations in the supply of available young animals. The implantation of permanent watering points caused an over-concentration of livestock in proximity to them, and consequent vulnerability when the rainfall declined and the pasture became insufficient. Despite a number of problems ranging from inappropriate technical assistance packages to slow delivery and poor maintenance of equipment, to host country exasperation with donor procurement procedures, several accomplishments were attributed to the Program which currently enrolls about 36,000 head of cattle. The major shift due to the Program, according to the presentation, is that herders have become weight conscious and they now insist on a specified amount of money by weight for the animals they sell. A concern for weight, it was suggested, is translatable into a concern for quality.

D. The Evolution of Livestock Projects in Botswana. The first Botswana livestock project began in 1970 aided by World Bank and Swedish funding, with the attempt to create thirty commercial ranches in the Western State lands and relieve some of the pressure around the crowded boreholes in the east. The project ran into resistance from persons inhabiting these Western lands, who felt that they were being deprived of portions of their traditional territory for the benefit of the strangers from the east. The strangers were already a privileged group since they were chosen from among the large cattle owners who were in a position to move vast herds at one fell swoop. From the planners' point of view, it was helpful to work with the big stockmen in order to reduce overgrazing around the eastern boreholes as expeditiously as possible. But the result was the further enhancement of an already advantaged segment of the population and the resentment of those whose lands were intruded on. There was an attempt with the Village Area Development Programme (VADP) to establish forty group ranches in the Western Lands for those with small herds. The VADP was to be based on participatory land use planning and a development model that was to build on local initiatives and priorities, but despite good intentions and SIDA funding it has not gotten off the ground.

Since 1975, Botswana has stepped up its livestock development with a series of actions, including the Tribal Grazingland Programme, begun at the personal direction of the President, and the Second Livestock Development Project. The former focuses on local group management of communal lands and the latter attempts to provide an environment conducive to private enterprise. The Workshop was interested in why Botswana seemed particularly responsive to learning from its past projects and why it seemed increasingly receptive to local input into project management. Several hypotheses were advanced to account for this progressive

posture:

- (1) Ethnic homogeneity removes one arena of confrontation from the decision-making process. The ethnic-ecological polarization, which is found in many Sahelian and East African countries, is not characteristic of Botswana. As in Somalia, many government officials are themselves livestock owners.
- (2) The emergence of the mining industry within the country may have taken some of the pressure off the livestock sector as an earner of foreign exchange.
- (3) Botswana has had great success in export marketing of high quality beef to European Economic Community countries and elsewhere. Their proximity to South Africa may have benefited the country not only in terms of the market but in learning from the contiguous state's range management practices.

Botswana has not attempted imposing limits on the numbers of livestock in its programs, and government officials state that such limitations would come only as community decisions. They do recognize their potential vulnerability to drought, and are concerned about the social and economic consequences of large numbers of animals suddenly being brought in for slaughter should the range be unable to sustain them. There was a suggestion that Botswana might consider expanding its abattoir capacity and open up new, lower price markets to accommodate the surge of cattle presentations that would occur with a drought. It is a tribute to the success of their marketing that an expansion of slaughter houses is contemplated; many African countries face the opposite problem of an abattoir capacity greatly in excess of supply.

6. Implications for Policy, Programs, and Project Design. In this section we outline some of the implications which emerged from the discussions for policy, programs, and project design. We remind the reader that votes were not taken on these issues, nor was a set of conclusions presented to the participants for their approval.

A. Objectives. It is difficult to harmonize the more prominent objectives of donor and host country interventions in the African pastoral livestock sector.

- (1) It is often stated that potential production levels are not being achieved. One of the recurrent objectives of interventions in the livestock sector is to increase production by means of an increase in the offtake rates. Pursuit of this objective has caused tensions between government administration and those pastoral producers who see current yields as the maximum sustainable under current conditions. The administration that favors an increase in production is also likely to subscribe to a price policy which advantages the urban consumer, and thus a major incentive to expand production via offtake is denied the producer.
- (2) The objective of increasing the production of low cost beef for the urban market (without the direct imposition of a government subsidy) conflicts with the objective of expanding high price export production.
- (3) As an aftermath of the drought there is an heightened consciousness of the environment. It is often assumed that the capacity of the environment to support livestock is declining, and that the cause of that decline is to be found in the nature of pastoral production sys-

tems, especially in the broad access to common range available to individual herd managers. Since donors and governments are interested in increasing production, they feel that attention must be paid to means of reducing and ultimately to reversing the declining carrying capacity of the range.

- (4) In rhetoric, a prime objective of livestock sector interventions is to benefit the producers by improving their incomes and the quality of their lives. It is very difficult to define in non-ethnocentric terms precisely what "quality of life" means, and it is hard to establish a direct functional relationship between a particular project design and a specific benefit to the producers however it is defined.

B. Caveats on Assumptions. The evidence examined by the Workshop does not reinforce any of the assumptions on which current pastoral livestock sector development actions are based.

- (1) Assumptions about environmental degradation are not sustainable without a considerably longer period of monitoring, in order that short-term fluctuations be distinguished from long-term secular trends. If we cannot sustain the assertion of general environmental degradation in the semi-arid rangelands, it is then premature to indict the herders for causing it, and therefore inappropriate to predicate development interventions on that indictment.
- (2) The enormous environmental complexity of Africa is itself a caveat, for discoveries made in any given area are not necessarily valid elsewhere, not even in nearby regions.

Yet the number of localized in depth ecological studies made in Africa is very small.

- (3) A major impediment to the design of livestock projects is our modest understanding of the ecology of annual grasslands. A drought grazing reserve, for example, is deceptively attractive, but may be of little value where grasses reseed annually. We need to know a good deal more about the impact of intensive grazing of different species on annual grasses, as we need to know a good deal more about the impacts of burning, of tick and tse-tse control, of rotational pasturing, and the like.
  - (4) Although there is tremendous interest in increasing off-take rates, and herders are often accused of an irrational retention of stock, little is known about the dynamics of yield nor even how precisely to measure yields which are currently achieved. Estimates of offtake in a region may vary by as much as 100 percent. Some participants felt that the offtake now achieved in some areas is itself the maximum feasible, given available technology and existing socio-economic conditions.
  - (5) The assumption of irrationality in marketing and the need for large-scale government interventions involving infrastructure (as opposed to tilting price policy to favor herders) has not been substantiated. Infrastructural interventions, and the actions of large-scale parastatal corporations, have not in general improved the marketing situation. In West Africa, for example, herders and private cattle brokers are able to walk animals from the interior to coastal markets with greater price efficiency
-

than they can be trucked or shipped by rail. In parts of East Africa, it was pointed out that the small scale at which private cattle traders operate is better adapted to supply than the large scale at which government marketing vehicles are required to operate. There is a serious question as to whether there is anything irrational about the existing marketing system that is improved by typical kinds of government intervention in infrastructure.

C. Implications for Action.

- (1) In the pastoral livestock sector, the general strategy should be to relieve producers of their anxiety about survival. Herders must be assured of their ability to sustain themselves in times of stress, such as those caused by inadequate rainfall and inadequate pasture.
- (2) It must be appreciated that animals are a rational form of investment, not merely an irrational "symbol of wealth and prestige". For herders to sell off animals beyond those needed for survival and subsistence, including their use to satisfy social obligations, attractive alternative avenues of investment must be made available. It is curious that while the attachment to livestock is considered irrational for herdsmen, investments in animals are frequently made by sedentary farmers and even government officials for whom such investments are rational indeed! The herder cooperative store at Birmou, Niger, presents a range of desired consumer goods at reasonable prices to enrolled persons, who sell animals and dairy produce to pay for their purchases.

- (3) Livestock interventions have too one-sidedly focused on bovine herds and ignored both small ruminants and camels. Mixed herds are a major adaptive strategy for pastoralists in semi-arid regions of Africa, for each kind of animal makes a different demand on the environment and plays a different role in the local economy. Small stock are the common form in which meat proteins are consumed by rural peoples, both herders and farmers. Goats are especially attractive because of their hardiness and because of their short gestation periods with frequent twinning. Yet goats have a very bad press and have received little positive attention, except where there is an interest in their hides. Cameline herding engenders no interest at all among planners, and this again is unfortunate because of the obvious adaptability of the African dromedary to the semi-arid and arid range.
- (4) Veterinary interventions remain attractive, and attempts at reducing calf mortality through health and nutritional measures are most promising and should have high payoffs. If the enormous calf losses in the first few days and months of life could be substantially reduced, the increased number of young animals would probably be sufficient in itself to satisfy much of current production targets.
- (5) A most promising area for government intervention in domestic livestock marketing -- although the political costs are potentially high -- is in price policy; the least promising area for direct government involvement is trading.

- (6) Pastoral livestock interventions must be planned in a regional context and take account of those ecological, social, economic, and political factors which are not within the project boundaries *per se* but which nonetheless will be affected by project activities.
- (7) More attention should be given to interventions which improve the dairy yields of a herd. It is especially important that beef-oriented projects not threaten the nutritional status of the herders by depriving them of sufficient quantities of milk for their own consumption.

D. Areas of Further Study. We here list some of the more salient areas in which Workshop participants felt additional research was needed to support the design of sound development actions.

- (1) There is need for a series of rangeland monitorings to determine the nature, extent, and causes of environmental change and degradation.
- (2) There is need to elaborate a typology of African pastoral production systems to determine the kinds of impacts likely from different types of intervention. It is important to be able to specify how interventions will affect different categories of persons, including women, children and the aged. It is important to determine the labor requirements of the various production systems, and to anticipate how the proposed interventions will affect the ability of herd managers to mobilize adequate amounts of labor.
- (3) There is need for deeper understanding of the strategies of pastoral movement and of the division of herds into various kinds of animals (by species, age, and sex).

Important insights are being obtained from the analysis of transhumance being carried out by Henk Breman and his students in Mali and Mauritania. Similar studies are needed in other parts of pastoral Africa.

- (4) Studies should be undertaken analyzing the wide variety of group ranches in Kenya to identify the impacts on their activities of size, ecological setting, scope, and organization.
- (5) Research should be expanded on the contribution of nutritional supplements on animal health and of other means of reducing calf mortality.
- (6) More health and nutritional research is needed focused on ovine, caprine, and cameline, as well as on bovine stock.
- (7) Studies are needed of the contributions of small stock to the rural economy.

Perhaps the most important recommendation from the Workshop relating to research is that the donors should facilitate this work being done primarily by Africans and in association with on-going or anticipated livestock development projects.

Several of the African participants spent some time in elaborating their concern that more of the technical and research work be done by host country persons. Where such a capacity does not currently exist, the donors could make a signal contribution by including more training -- both on- and off-the-job -- in their portfolios. They felt that having adequate cadres of trained African personnel would go a long way to reducing the problem of continuous changing of expatriate personnel whose tours of duty are too short or who are simply poorly prepared for the physical conditions under which they will work. In addition to training and employing host country persons, far more of the identification, research, and design work should be done by host country

institutions. AID missions must be made more sensitive to those resources of persons and institutions which already exist within the host countries, often literally around the corner from the AID office.

\* \* \*

The Workshop on Pastoralism and African Livestock Development emerged out of a fundamental concern relating to participation. Livestock sector projects have almost never involved the active participation of pastoral peoples in their identification, design, implementation, or evaluation. Livestock sector projects have not performed very well. It was the consensus of the Workshop that those two statements are closely related.

## Appendix I

### WORKSHOP ON PASTORALISM AND AFRICAN LIVESTOCK DEVELOPMENT

Michael M. Horowitz, Director

#### PARTICIPANTS

Abdel-Ghaffar Mohamed Ahmed  
Associate Professor of Anthropology  
University of Khartoum  
P. O. Box 321  
Khartoum, Sudan

Frank P. Araujo  
Assistant Professor of Anthropology  
(Western Sudan Agricultural Research Project)  
Department of Anthropology  
Washington University  
P Previous Page Blank

Joan Atherton  
Social Science Analyst  
AID/PPC/PDPR/RD  
Washington, D. C. 20523

Lukas J. Ayuko  
Head, Range Management  
Ministry of Agriculture  
P. O. Box 30028  
Nairobi, Kenya

Marjorie S. Belcher  
2912 Dumbarton Street, N. W.  
Washington, D. C. 20007

Quincy Benbow  
Agricultural Development Officer  
AID/AFR/DR/ARD  
Washington, D. C. 20523

John W. Bennett  
Professor of Anthropology  
Department of Anthropology  
Washington University  
St. Louis, MO 20022

Robert J. Berg  
Associate Assistant Administrator  
AID/PPC/E  
Washington, D. C. 20523

Edmond Bernus  
Directeur de Recherches ORSTOM  
Géographe-chercheur  
27 Quai de la Tournelle  
75005 Paris, France

Richard Blue  
Chief, Studies Division  
AID/PPC/E/S  
Washington, D. C. 20523

Philippe Blanc  
Livestock Specialist  
World Bank  
1818 H Street  
Washington, D. C. 20433

Douglas W. Butchart  
Senior Livestock Specialist  
AID/AFR/DR/ARD  
Washington, D. C. 20523

Goler T. Butcher  
Assistant Administrator  
AID/AFR  
Washington, D. C. 20523

Joseph Conrad  
Professor of Animal Nutrition  
Coordinator, Tropical Animal Science Program  
Department of Animal Science  
2103 McCarty Hall  
University of Florida  
Gainesville, FL 32605

Gudrun Dahl  
Research Associate  
Department of Social Anthropology  
University of Stockholm  
Asögatan 120  
11624 Stockholm, Sweden

Moulaye Diallo  
Docteur Vétérinaire  
Conseiller CILSS  
BP 7049  
Ouagaougou, Upper Volta

Hamadi Dicko (Mali)  
Student  
University of Arizona  
714 E. 10th Street, Apt. # 9  
Tucson, Arizona 85719

Frank M. Dimond  
Evaluation Officer  
AID/AFR/DP  
Washington, D. C. 20523

M. McDonald Dow  
Deputy Director, BOSTID  
National Academy of Sciences  
2101 Constitution Avenue NW  
Washington, D. C. 20418

Neville Dyson-Hudson  
Department of Anthropology  
State University of New York at Binghamton  
Binghamton, NY 13901

Shirley A. Erves  
Uganda Desk Officer  
AID/AFR/EA  
Washington, D. C. 20523

Donald S. Ferguson  
Agricultural Economist  
USDA-Technical Assistance Officer  
4608 Millburn Ct.  
Alexandria, VA 22309

Patrick Fleuret  
Social Science Analyst  
AID/PPC/PDPR/HR  
Washington, D. C. 20523

John G. Galaty  
Assistant Professor of Anthropology  
Department of Anthropology  
McGill University  
855 Sherbrooke Street W.  
Montreal, Quebec H3A2T7  
Canada

Ibrahim Garba (Niger)  
Student  
Department of Rural Sociology  
University of Missouri  
Columbia, MO 65211

Jere Gilles  
Assistant Professor  
Investigator, Small Ruminants CRSP  
Department of Rural Sociology  
University of Missouri  
Columbia, MO 65211

Myron Golden  
Officer-in Charge  
Sahel Development Program Office  
AID/AFR/SFWA  
Washington, D. C. 20523

Harold S. Gray  
Officer-in-Charge  
Senegal Basin States  
AID/AFR/SFWA  
Washington, D. C. 20523

Gregory B. Greenwood  
Student  
Department of Range Science  
Colorado State University  
220 E. Laurel Street, #15  
Fort Collins, CO 80524

Ibrahim Sory Gueye  
Directeur General SODESP  
46 Zone A, Dakar  
B. P. 10.282 Senegal

C. E. Haines  
Livestock Advisor  
AID/DS/AGR.  
Washington, D. C. 20523

John B. Hannum  
Administrative Assistant (Programs)  
ACTION  
806 Connecticut Avenue, NW  
Washington, D. C.

Larry W. Harms  
Livestock Advisor  
Acting Agricultural Development Officer/Livestock  
AID/Bamako  
Washington D. C. 20520

Harold F. Heady  
Assistant Vice President for Agriculture  
University of California  
317 University Hall  
Berkeley, CA 94720

Lawrence C. Heilman  
Deputy Director for Technical Services  
AID/AFR/DR  
Washington, D. C. 20523

Allan Hoben  
Professor of Anthropology  
Boston University  
Visiting Development Fellow  
Overseas Development Council  
1717 Massachusetts Avenue  
Washington, D. C. 20036

James H. Hughes  
Agricultural Development Officer  
AID/Nouakchott  
Department of State  
Washington, D. C. 20520

Charles P. Humphreys  
Economist  
World Bank  
Room E 327  
1818 H Street, NW  
Washington, D. C. 20433

Salisu A. Ingawa (Nigeria)  
Student  
Department of Agricultural Economics  
Michigan State University  
East Lansing, MI 48823

Keith Jamtgaard  
Small Ruminant CRSP  
University of Missouri  
Columbia, MO 65211

Douglas L. Johnson  
Associate Professor  
School of Geography  
Clark University 950 Main Street  
Worcester, MA 01610

Twig Johnson  
Social Science Advisor  
AID/PPC/E/S  
Department of State  
Washington, D. C. 20523

William H. Johnson  
Chief, Division of Agriculture and Rural Development  
AID/AFR/DR  
Washington, D. C. 20523

Jim Kelly  
Director  
AID/AFR/SFWA  
Washington, D. C. 20523

A. B. Kgosidintsi (Botswana)  
Student  
International Programs Office, Room 2112  
Agriculture-Science Building  
West Virginia University  
Morgantown, West Virginia 26505

Asmarom Legesse  
Professor of Anthropology  
c/o IPAL-KALLACHA  
UNESCO  
PO Box 30592  
Nairobi, Kenya (Through August 1980)

John V. D. Lewis  
Economic Anthropologist  
AID/DS/RAD  
Washington, DC 20523

Peter D. Little  
Rural Development Analyst  
AID/DS/RAD  
Washington, DC 20523

Mark A. Marquardt  
Student  
Land Tenure Center  
310 King Hall  
University of Wisconsin at Madison  
Madison, Wisconsin

Melkiori Matwi  
Cultural Research Officer  
Ministry of National Culture and Youth  
Department of Research and Planning  
PO Box 4284  
Dar-es-Salaam, Tanzania

Henry L. Miles  
Evaluation Officer  
AID/AFR/DP  
Washington DC 20523

Jon R. Moris  
Associate Professor of Anthropology  
Utah State University  
Department of Sociology, Anthropology and  
Social Work  
UMC07, Utah State University  
Logan, Utah 84322

Abdoulaye Niang (Mali)  
Student  
Purdue University  
209-5 Airport Road  
W. Lafayette, Indiana 47906

Marcia Odell  
Research Associate  
Institute of Development Management  
Box 1357  
Gaborone, Botswana

Tebogo Nkwe (Botswana)  
Student  
West Virginia University  
1056 Van Voorhis Road  
Medical Center Apts. K118  
Morgantown, W. Va. 26505

Ingrid Peters  
Ethiopia Desk Officer  
AID/AFR/EA  
Washington, D. C. 20523

Karen M. Poe  
Program Analyst  
AID/PPC/PB  
Washington, DC 20523

Ouaïdou Ramadan  
Docteur Vétérinaire  
Directeur Adjoint de l'Élevage du Tchad  
Direction Elevage B.P. 750  
Ndjamena, République du Tchad

Ned S. Raun  
Animal Scientist  
Director, Production Programs  
Winrock International Livestock Research and Training  
Center  
Morrelton, Arkansas 72110

Jim Riddell  
Associate Professor  
Land Tenure Center  
University of Wisconsin  
Madison, Wisconsin

Peter Rigby  
Professor of Anthropology  
Temple University  
Philadelphia, PA 19122

Barry Riley  
Chief, Policy Planning, Evaluation  
and Economic Analysis Division  
AID/AFR/DP  
Washington, D. C. 20523

Alioune Sall  
Sociologue  
Conseiller pour les Ressources Humaines, CILSS  
B.P. 7049  
Ouagadougou, Upper Volta

Stephen Sandford  
Research Officer  
Overseas Development Institute  
10-11 Percy Street  
London, W1P 0JB, U. K.

J. Carole Scherrer  
Botswana Desk  
AID/AFR/SA  
Washington, DC 20523

Harold K. Schneider  
Professor of Anthropology  
Indiana University  
Bloomington, Indiana 47405

Solomon G. Sherman  
Rural Development Officer  
USAID/Liberia  
APO NY 09155

Poul A. Sihm  
Research Coordinator, Arid Zones & Monitoring  
ILCA  
PO Box 5689  
Addis Ababa, Ethiopia

John Staatz  
Student  
Department of Agricultural Economics  
Michigan State University  
East Lansing, MI 48924

Wilbur G. Thomas  
Livestock Projects Manager  
AID/Dakar  
Washington, DC 20520

Theresa Anne Ware  
Coordinator/African Studies Outreach  
Howard University  
African Studies Center  
Washington, DC 20059

Richard Trevor Wilson  
Senior Animal Scientist  
Centre International pour l'Elevage en Afrique  
Programme du Sahel  
B.P. 60  
Bamako, Mali

Lawrence A. Witucki  
Agricultural Economist  
USDA, ESCS, IED  
Room 396, GHI Bldg.  
Washington, DC 20250

Benson M. Woie  
Senior Research Officer  
Ministry of Agriculture  
Kiboko Range Research Station  
PO Box 12  
Makindu, Kenya

INSTITUTE FOR DEVELOPMENT ANTHROPOLOGY

WORKSHOP STAFF

Alexander Fischler, Translator

Michael M. Horowitz, Director

J. Terrence McCabe

Muneera Salem Murdock, Assistant to the Director

Thomas M. Painter

Alfred S. Waldstein, Rapporteur

Appendix II

WORKSHOP ON PASTORALISM AND AFRICAN LIVESTOCK DEVELOPMENT

Michael M Horowitz, Director

AGENDA

Sunday, 23 September 1979

1600 - 2030 Registration

1930 Dinner

2030 Session I. Pastoral Society and Ecology: I.

Chair: Dr. Carole Scherrer, AFR/SA

Previous Page Blank Discussion Leader: Dr. Asmarom Legesse, Swarthmore College

The discussion will follow projection of films from Northern Kenya:

Kenya Boran (33 min.)  
Boran Herdsmen (17 min.)  
Boran Women (18 min.)

Monday, 24 September 1979

0700 - 0830 Breakfast

0830 - 1230 Registration

0900 - 1200\* Session II. Objectives of Donor Intervention in the African Pastoral Livestock Sector: Hierarchy, Complementarity, and Potential Conflict:

1. Increasing meat production of (a) domestic consumption and (b) export.
2. Retarding and reversing environmental degradation and desertification.
3. Improving the income and enhancing the quality of life of pastoral producers.

Chair: Mrs. Goler T. Butcher, Assistant Administrator  
Bureau for Africa, Agency for International Development

Discussion Leader: Dr. Douglas Butchart, AFR/DR/ARD  
The Africa Bureau Program in the Pastoral Livestock Sector.

\* = There will be coffee breaks during morning and afternoon sessions.

Previous Page Blank

1230 Lunch

1400 - 1830\* Session III. Constraints on the Achievement of Intervention Objectives in the Pastoral Livestock Sector: I

Chairs: Mr. Stephen Sandford, ODI, and Mr. Alioune Sall, CILSS

A. Constraints on Increasing Pastoral Production in the Sahelian and Sudanic Zones.

1. Environmental constraints and herder adaptations.
2. The identification and assessment of range degradation.
3. Competition and symbiosis between agriculture and herding.
4. Effects of government policies and programs.
5. Commercialization and marketing.
6. Presentation of a "new generation" project: Senegal SODESP.

Discussion Leaders: Dr. I. S. Gueye, SODESP, and  
Dr. Wilbur Thomas, AID/Dakar.

1900 Dinner

2030 Session IV. Pastoral Society and Ecology: II.

Chair: Dr. R. T. Wilson, ILCA

Discussion Leaders: Dr. J. V. D. Lewis, DS/RAD, Mr. Hamadi Dicko, University of Arizona, and Mr. Abdoulaye Niang, Purdue University.

The discussion will follow projection of a film by Dr. Henk Breman on the FulBe transhumance in Mali/Mauritania, and will focus on the relevance of such movement and range use for interventions in the Malian livestock sector.

2200 Informal Gathering.

Tuesday, 25 September 1979

0700 - 0800 Breakfast

0830 - 1200\* Session V. Constraints on the Achievement of Intervention Objectives in the Pastoral Livestock Sector: II.

Chairs: Professor Abdel-Ghaffar M. Ahmed, University of Khartoum, and Dr. Peter Rigby, Temple University, Mr. Melkiori Matwi, Government of Tanzania.

B. The East African Highlands.

Discussion Leaders: Dr. Gudrun Dahl, Stockholm University,  
Dr. Allan Hoben, Boston University, and  
Dr. Jon Moris, Utah State University.

Case: Tanzania Maasai Range and Livestock

C. Southern Africa.

Discussion Leaders: Dr. Marcia Odell, AID/Gabarone, and Dr.  
William H. Johnson, AFR/DR/ARD

1230

Lunch

1400 - 1800 \* Session VI. Discussion of Major Additional Issues: I.

Chairs: Dr. P. A. Sihm, ILCA, Dr. E. Bernus, ORSTOM, and Dr.  
H. F. Heady, University of California.

In this and the following session, a series of issues will be discussed, drawing on materials from the preceding sessions. The questions which follow are suggestive only, and they are presented as guides to discussion. Their numbering implies no necessary sequence or inherent ranking in terms of significance.

1. How is institution building justified in terms of increased production and/or increased producer incomes or more effective resource utilization?
2. What is the relevance and impact of training on producer income, production, and effective resource utilization? Who is being trained under existing projects and programs? Who is doing the training?
3. What is the relevance and impact of extension on producer income, production, and effective resource utilization? Have extension agents learned to evaluate existing production systems? What rewards do extension agents receive for increased benefits to herders?
4. Is the fraction of project/program resources expended on institution building, training, and extension justified by an analysis of their real benefits to production, income, and resource base? What assumptions must be made in such an analysis?
5. What is the relationship between marketing and project/program objectives? What are the optimal roles of the state (and parastatal corporations) in livestock marketing? Do public and private sector marketing differ in their ability to attract animals from the range and in providing a revenue incentive to the producers?

6. What is the significance of the location of slaughter-houses?

7. How do the range management components of projects deal with specific local ecological conditions? How do these components relate to existing range management practices and land use patterns of pastoral peoples themselves? Has administrative convenience intruded on range monitoring? Have range users been given responsibility for and authority over range protection? Does the fraction of program and project funds devoted to range management correspond to the importance it is given in policy and strategy statements?

8. What is current thinking on pest control? How has the environmental impact of control programs for different pests been assessed? Do pests contribute to balanced animal/forage ratios?

9. What are the environmental impacts of increased numbers of stock on "new lands?" What are the long-term ecological differences between sedentary and transhumant herd management? What are the incentives for herdsman to sell young stock to farmers in the new lands?

10. Zonal stratification envisages expanded cattle raising in the intermediate rainfall zones. Can sedentary stockmen grow sufficient forage not to overgraze the range in proximity to the village? What are the economic costs/incentives of such forage production? Have these costs/incentives been adequately factored into project design?

11. Do the traction and manure benefits of mixed farming compensate for the increased costs to the farmers? Where have farmers voluntarily and successfully changed from the hoe to the animal-drawn plow? Where have such attempts (i.e., among the Mossi) failed? Why? What are the ecological consequences of plow cultivation in different ecological zones? under different forms of production?

12. What is the relevance of reforestation actions on pastoral ranges and among sedentary stockmen? What are the possibilities of local control over tree resources?

13. Under what conditions and at what scale are feedlots economically feasible? Under what conditions and at what scale is peasant feeding and finishing feasible?

14. What are the ways in which credit in livestock interventions might be equitably delivered? What are the kinds of existing mechanisms which might be invoked to guarantee debt repayment?

15. How can it be determined if herdsmen (whether transhumant or pastoral) can reasonably be expected to provide for continuing and recurrent costs once the original project period is complete?

1830 Dinner

2000 Session VII. Discussion of ILCA Monitoring System.

Chair: Dr. Poul Sihm and Dr. N. Dyson-Hudson, ILCA

Wednesday, 26 September 1979

0700 Breakfast

0830 - 1200 \* Session VIII. Implications of Discussion for Policy, Programs and Project Design.

Chair: Mrs. Goler T. Butcher, AA/AFR and Dr. M. M Horowitz.

1. What is an appropriate AID strategy for the African pastoral livestock sector?
2. How can AID mobilize and make relevant current knowledge and expertise in the elaboration of livestock sector programs and projects?
3. How can AID most effectively respond to the mandate that its activities reach the rural poor in the livestock sector? How can the interests of women, children, deprived ethnic groups, and the aged be responded to in these activities?
4. What are the needs for further research and evaluation in the African livestock sector?

1230 Lunch

1400 Departure.



- |    |   |   |   |   |   |   |
|----|---|---|---|---|---|---|
| 2. | A major cause of poor performance of livestock development projects is that they are predicated on false or, at best, substantially flawed assumptions about pastoral ecology, economic decision-making, social and political organization. | 1 | 2 | 3 | 4 | 5 |
|----|---|---|---|---|---|---|

Amplification: The Project Identification Document for AID's Senegal SODESP project contains the following charge:

The principal problem in developing Senegal's pastoral resources is in finding means of changing the prevailing traditional livestock production system. The largest failure of this system is that there is no way to assure that cattle numbers remain within the carrying capacity of a given area. Thus, the consequence of such "beneficial" measures as improved animal health and better water supplies have often been over-stocking and eventual degradation of the pastures. In short, it is a cyclical system of feast and famine. Under the traditional communal system of pasture utilization, an individual herd owner usually grazes as many animals as he can in an attempt to minimize his risk in a drought and to maximize his share of the communally owned pasture resource. He has no incentive for improvement. Thus, the principal problem is one of controlling herd size in relation to the capacity of the range land.

- |       |  |   |   |   |   |   |
|-------|--|---|---|---|---|---|
| 2.1   | There is long-term secular degradation of the African range.   | 1 | 2 | 3 | 4 | 5 |
| 2.2   | This degradation is a consequence of over-grazing.   | 1 | 2 | 3 | 4 | 5 |
| 2.3   | Over-grazing is a result of communal access to range combined with individual ownership of stock.  | 1 | 2 | 3 | 4 | 5 |
| 2.3.1 | Herd size is effectively limited by the herd owner's ability to mobilize labor.  | 1 | 2 | 3 | 4 | 5 |
| 2.3.2 | In many parts of Africa, access to range and water is not unrestricted; in those areas, range management schemes could be elaborated on existing usufructory rights. | 1 | 2 | 3 | 4 | 5 |
| 3.    | Offtake rates are low in Africa, because herdsman evaluate livestock as objects of prestige and wealth, rather than as objects of economic exchange.                 | 1 | 2 | 3 | 4 | 5 |
| 3.1   | Herdsman do not respond to market incentives.  | 1 | 2 | 3 | 4 | 5 |
| 3.2   | They exhibit this non-responsiveness by "backward-bending" supply curves; as market prices rise, market offerings decline.   | 1 | 2 | 3 | 4 | 5 |
| 3.3   | Demographic/ecological requirements of herds which provide for local nutrition do not encourage substantially increased offtake.                                     | 1 | 2 | 3 | 4 | 5 |
| 3.4   | Nonetheless, the average cattle herd contains a far larger number of male juveniles and adults than required.  | 1 | 2 | 3 | 4 | 5 |



- |     |   |   |   |   |   |   |
|-----|---|---|---|---|---|---|
| 7.  | <u>Embouche bovine</u> (small farmer feeding and finishing of cattle), either alone or in combination with ox traction, may prove to be economically unviable for small farmers, even where such farmers have a tradition of investing in cattle which are then consigned to pastoral specialists for their care. | 1 | 2 | 3 | 4 | 5 |
| 7.1 | Raising of small ruminants, on the other hand, is more likely to prove economically viable.   | 1 | 2 | 3 | 4 | 5 |
| 8.  | Administrative units responsible for pastoral live-projects are not normally held accountable for the welfare of herders.   | 1 | 2 | 3 | 4 | 5 |
| 8.1 | Project employees have little incentive to assist pastoralists or view them as constituents, since pastoralists tend to be politically marginal, belonging to ethnic and linguistic groups that are poorly represented in national administrative circles.  | 1 | 2 | 3 | 4 | 5 |
| 8.2 | Administrative policies, such as price policy, bush fire regulations, and even mandatory vaccination of stock, are imposed without herder participation, and are viewed by them with suspicion and often hostility.   | 1 | 2 | 3 | 4 | 5 |
| 8.3 | "Improvement of herder income and quality life" is honored more in rhetoric than in action in livestock projects whose prime aim is to increase beef production and whose subsidiary aim, at least recently, is to slow and reverse environmental degradation.  | 1 | 2 | 3 | 4 | 5 |
| 9.  | Most livestock development projects have failed to involve the pastoralists in project design and implementation, such that they will have the incentive, means, and responsibility for maintenance, recurrent costs, and regulation of project-created resources.  | 1 | 2 | 3 | 4 | 5 |
| 9.1 | Many pastoral groups have the organization and fiscal capacities to participate in livestock projects in this way.  | 1 | 2 | 3 | 4 | 5 |

Amplification: compare FAO Hema project in Syria.

\* \* \* \* \*

The above list of propositions is not meant to be exhaustive. We are likely to follow up with additional items and a further request for response. Please feel free to comment on whatever additional items you feel are important, and to indicate those which you would like to have circulated for response to the other participants. With many thanks.

The questionnaire was distributed to elicit responses that would guide the staff in identifying topics for emphasis at the Workshop. Where a high degree of consensus was achieved, less time was allocated to the issue involved. Where there was a range of opinions, more discussion was anticipated. Twenty-seven questionnaires were returned prior to the Workshop, and the responses are summarized below. (Those returned later are

Issue	Agree					Disagree					Mean
	1	1.5	2	2.5	3	3.5	4	4.5	5		
1	10		13		1		2			1.8	
2	15		10		1		1			1.6	
2.1	4		11		10		2			2.4	
2.2	1		9		8	2	7			2.9	
2.3	3		7		7		5	1	4	3.1	
2.3.1	3		7		7		4	1	5	3.1	
2.3.2	6		11		8	1	1			2.2	
3	2		4		3		12		5	3.5	
3.1	1		2				15	1	6	4.0	
3.2	1		6		4		7		5	3.4	
3.3	1		12		4		2		3	2.7	
3.4	1		3		6		11		6	3.7	
3.4.1	6		11		5		1		1	2.2	
3.4.2	5		11		7		3			2.3	
3.4.3	4		11		4		2			2.2	
4	13		10				3			1.7	
5	8		15				2		1	2.0	
5.1	13		8		2		2		1	1.8	
6.1	4		10	2	6		2		1	2.4	
6.2	7		9		7		1		1	2.2	
7	2		11		11		1		1	2.5	
7.1	5		10		7	1	2			2.3	
8	4		15		4		1			2.1	
8.1	2		18		4		1			2.2	
8.2	7		15		2					1.8	
8.3	9		13		1		2			1.8	
9	13		11		1				1	1.7	
9.1	6		11	1	4		1		2	2.3	

excluded as perhaps having been influenced by the proceedings.) The respondents include nine social scientists, seven economists and agricultural economists, six range scientists and ecologists, four animal scientists and veterinarians, and a geographer. Eleven of these are academics (among whom

are former AID officers), seven are currently AID, PC, and DOA officials, two are officers with multi-lateral development organizations, four are members of non-governmental development research institutions, and three are Africans who work with livestock sector problems in their own countries.

The responses are merely indicative of pre-Workshop points of view, and are not a scientific sampling of professional opinion. Persons were forced to take a scaled position on what are basically qualitative issues and the questions themselves are subject to alternative interpretations which, of course, influence the response. Several of the respondents chose to amplify their answers with narrative material. Portions of some of these were very useful, and sections are reproduced here:

Issue I. Livestock development projects in Africa have poor performance records. What is a "poor performance?" How is it measured? Have livestock projects worse performance records than other production oriented interventions? Do livestock project performance records in Africa differ markedly from those achieved in other parts of the world. Please list examples of "worst case," "poor performance," "good performance," and "best case" livestock projects.

Responses:

(1) In general you are putting too much emphasis on "projects" and not enough on general programmes (eg veterinary) or even changes with which government has been little concerned. You do not differentiate enough between "pastoral" systems (extensive use of dry areas) and other livestock systems.

Some projects (particularly dairy) especially in high potential areas have a good record of raising marketed output and herdsmen's incomes. For pastoral projects the record of success in stabilising livestock populations is poor but other aspects (eg veterinary) have fair records.

A "poor" performance is one which fails to meet "someone's" "proper" objective. Some objectives are "improper" in the sense of being misconceived. Otherwise "success/failure" is ambiguous unless coupled to a reference to objective and evaluator.

(2) Poor performance would be the failure of the project to meet objectives, as in failure to control the growth of herds relative to determined grazing potential. A good example is the failure of the Karamojong scheme, detailed by Baker, which led the government to abandon attempts to control grazing and in effect abandon Karamojong grazing grounds to agriculturalists to the west.

The problem in answering this question, as its composer understood because he put these evaluative terms in quotes, is that it depends on whether you are evaluating the performance from the view of the developers or the pastoralists. Thus, a "good" performance (although it was not produced by managers) is the Kaputeii Maasai example, where a group of Maasai entrepreneurs reconstituted their operations in terms of beef production and took to monetary investments as the way to increase wealth. A consequence was the cutting off of other Maasai from the grazing grounds claimed by these entrepreneurs.

I cannot say whether the performance of livestock projects is worse than others, but my impression is that there have been many more successful agricultural schemes (Teso cotton, Sukuma cotton, Chagga coffee, Baganda coffee, etc.) than ranching schemes, although the figures on beef takeoff in Meyn's Beef Production in East Africa suggests that there is a growing number of people (like Meru) who have quietly, perhaps on their own, shifted from managing cattle as repositories of value to beef production.

I cannot say how even West African performance compares to East Africa (my remarks are addressed to East Africa) but I have the impression that among Navajo, and in North Africa and the Near East similar problems have been encountered in trying to control pastoralism.

(3) 1.1 Given the contradictory goals of projects it is difficult to make an overall assessment of given projects, other than when little or no impact of the project occurs. Many goals such as destocking, greater livestock sales, stock upgrading and disease control, provision of social services, better nutrition, etc., are clearly independent of one another, if not incompatible in some cases (such as disease control and destocking in the short run; or better management through changed land tenure and increased economic-political hierarchy, and social betterment of the entire society, in the long run). In general, then, poor performance refers to level of general impact, which I would generally assess to be low (not always an unfortunate outcome). More specifically, certain projects emphasize one set of goals and thus do not achieve in the area of alternative sets of goals; for the time being, the Maasai Group Ranch schemes have consolidated land tenure for the entire population at the expense of livestock development innovations - though this phenomenon might not prove generally true for much longer, as each ranch makes its individual decisions about future inputs, based on their own pattern of membership and interests.

1.2 Yes, generally livestock development projects would appear to have worse performance records, primarily due to antithetical outcomes built into plans for the future of pastoral societies. In many cases, failure is built into schemes by unmeasurable or unrealistic expectations regarding total social transformation, and by blatant anti-pastoralist sympathy of planners and administrators, yielding the "now do you believe me"

phenomenon. Some analogues occur, however, in the tension between commercialization and community welfare in agricultural development schemes, development of cash crops producing lower levels of subsistence and higher malnutrition, for example.

1.3 Without detailed knowledge, I have the sense that very similar problems are being faced elsewhere than in Africa and thus that performance records are little better in the Middle East, Mongolia, India, etc.

1.4.1 Worst cases might be the Samburu Grazing Schemes of the 1940s-50s.

1.4.2 Poor performance case might be the early Kaputie model ranch in the late 1950s, which collapsed in the drought.

1.4.3 Good performance project might be the Maasai Group Ranches (though wide variation exists), less for the development of a livestock industry than in the possible consolidation of land tenure by Maasai groups which may provide the basis for a defense of the industry against those who would transform the area into mixed farms, commercialized wheat ranches, etc.

1.4.4 The best case may be the initiatives in South Baringo where land reclamation and the development of industrial infrastructure is reported.

(4) One of the more startling facts . . . was the almost uniform lack of success among those development projects concentrating on the livestock sector. By "poor performance" I am referring to the inability of the livestock projects to meet their desired goal, i.e. to increase the amount of meat available within the country that the development project is located. The phrase "poor performance" can be misleading, however, in that success or failure is measured in terms of increased meat production while ignoring factors which may be very important to those participating in the project. I am here referring to such things as social cohesion within the family, the role of women in the social system, the ability of the family to maintain social relationships with other families which increases the chances that the family remain viable during periods of environmental perturbations, etc. I feel that for development projects to be truly successful improvements in the health, economic life and social life of the participants of the development project must be demonstrated in addition to increased meat production.

(5) 1.1 Often we consider the project "poor performance" if predetermined goals are not met.

On the other hand I have had some projects that did not meet our predetermined goals but were great projects for reasons we did not even suspect - i.e. our failure to anticipate some good effects, usually because we did not understand peoples motivations nor their environmentally induced logic. But sometimes we had bad effects that were not anticipated **even though** the predetermined goals were met. Its very hard to be certain that a project was poor or good unless one completely overwhelms the other.

1.2 Yes - but not always directly. An important consideration is that the poor performance was more a problem of the stuff the livestock eats than that of the animals themselves. This partly because in Africa the animals mostly eat "wild" herbage as opposed to a crop like millet or sorghum, i.e., the feed was not a planted crop, it involved little if any investment, it often had no clear cut owner and the use of it was more a right than a cost. This does not mean that the nomads do not try to manage range, they do, but range does not have the attention nor importance that a planted and harvested crop has. I have known of people being killed for allowing their livestock to eat a farmer's crop, while this would not likely happen to a grazer allowing his cattle to invade another's range, unless it was obviously intentional and particularly flagrant.

Spatial relationships are also important. A grain crop is seen on a small acreage and the value appears concentrated and high, while the forage crop is thin and scattered and the value seems dispersed and relatively low. I think that there was better range management practices observed before the political inventions of the Colonial period. (This is largely conjecture pieced together from readings, conversations with elders and French students of "French Equatorial Africa" and other equally unreliable sources). It appears to me that in earlier times the village elders and tribal chieftans recognized when certain grazing areas needed rest and for how long. They were also in a power position to enforce their range management decisions and to restrict outsiders. These decisions were probably fairly good ones as the people survived such drought periods as the 1913 drought, that was equally as severe as the latest one, and other earlier ones without outside help. After the colonial period, new governments were in power, the tribal decision makers' authority had eroded somewhat and the new decision makers did not really know what decisions to make. Graziers, in a sort of leadership vacuum, probably eased off of the more difficult range management practices like taking cattle farther away to more lightly grazed areas giving more accessible areas much needed rest. Of course one could argue that the apparent earlier good performance may have been due to the fact that there were fewer people and livestock then, and therefore less pressure on the range. This surely explains part of the phenomena but probably not all of it. If I'm right this gives us reason to hope that improved low cost management techniques might help restore depleted range to some higher productivity if these techniques can be applied in a manner consistent with the true value judgements, social implications and economic realities of the people concerned.

Another problem is that much less is known about the performance or requirements of pasture plants than those of crop plants like sorghum or millet. Pastures are made up of literally hundreds of species and little is known of their genetic make up, water and fertility requirements, temperature tolerances, insect resistance, etc. All of these are known for cultivated crop plants; therefore mistakes are more frequent, performance less predictable and final outcome more nebulous under range conditions.

Also the grazier is more likely to think of his livestock (i.e., his crop) as his basic resource, while the farmer is more likely to think of the soil as his basic resource. This is an attitudinal factor that often affects land management decisions.

Any animals over the number required to maintain his family, he usually considers as his bank account. What he needs is a bank account that doesn't eat his grass.

1.3 In the magnitude of the problem, no. In the type of problem, Yes.

1.4.1 Sending Hereford and Angus cattle to the wet tropics. Contracting Montana State University technicians to work in Paraguay, etc.

1.4.2 An artificial insemination project for beef cattle in Bolivia, 1961.

1.4.3 An artificial insemination project for Dairy Cattle in Chile, 1957-1960.

1.4.4 An improved pasture program for dairy cattle in Chile, 1957-1960.

(6) 1.1 Performance is measured according to project goals. While projects have had many different explicit goals, I believe in general they aimed to increase net social welfare, perhaps constrained by considerations of social justice - a Pareto improvement. In general I find past pastoral development projects to be a mixed lot; and their functional relations to actual levels of welfare problematic. In many cases, projects don't seem to affect the pastoralists much at all, or if they do, only during the life of the project. They do not equip the pastoralists for the changing physical and social environment they inhabit.

Measurement should follow from operationally defined goals. The difficulty lies in operationally defining them (Good hedge!)

1.2 I think probably pastoral projects have performed more poorly, because of the projects' inability to develop or communicate rational alternatives for herders. Perhaps this stems from the more complex adjustments to the environment that the pastoral life style makes or is. Much African agriculture has been converted to a cash system - what is or appears rational does so within a more defined context.

1.3 Don't know - It would depend on who is doing the herding. For subsistence herders in Baluchistan, development projects such as those attempted in Africa would probably fail. If, however, projects dealt with rich Venezuelan (i.e. Latin American) ranchers, rationality would be similarly confined and projects easy to implement.

1.4 I don't have enough first-hand experience to give examples. Projects that attempt to control or improve a number of physical and social parameters would seem to be the "best." The LCBC Assale-Serbewel project is thus the best project I know of.

Issue II. A major cause of poor performance of livestock development projects is that they are predicated on false or, at best, substantially flawed assumptions about pastoral ecology, economic decision-making, social and political organization.

- 2.1 There is long-term secular degradation of the African range.
- 2.2 This degradation is a consequence of overgrazing.
- 2.3 Over-grazing is a result of communal access to range combined with individual ownership of stock.
  - 2.3.1. Herd size is effectively limited by the herd owner's ability to mobilize labor.
  - 2.3.2. In many parts of Africa, access to range and water is not unrestricted; in those areas, range management schemes could be elaborated on existing usufructuary rights.

Responses:

(1) 2.1. Answer (3). For (lack of) evidence on this see Warren Maizel's review for UNCOD (UN Conference on Desertification). To get evidence on degradation one needs a sensible definition of it and data over a long enough period to abstract from cyclical effects. This has never been done, nor data collected anywhere.

2.2. Answer (3) shading to (4). If degradation is taking place we do not know (in Africa) how this is related in time to an increase (if any) in effective grazing pressure (defined as biomass of herbivores per unit of accessible pasture).

2.3. Answer (4) shading to (5). For the statement to be "true" one would need to show that private cattle and communal pasture leads to more degradation than private cattle and private pasture or communal cattle and communal pasture. The evidence of US/Australia does not give us much reason to trust the double private solution, and we know nothing about the direction of degradation in the double communal solutions in USSR and Mongolia; although there is some evidence (UNCOD documents) that degradation is being halted in China.

2.3.1. Answer (3) shading to (4). Please do not start a new "myth". In some cases labour is the limiting factor on expansion. In many others (eg., Saudi Arabia -- see Cole in Pastoral Network Paper 7e) it is not.

2.3.2. Answer (3) shading to (4). The problem in the question is "existing usufructuary rights". In almost all places the situation is changing so fast we face the old Greek Philosophical problem "Can we ever enter the same river twice?". In attempting to support "traditional systems" one may, in fact, be imposing a new exploitative system; as much as "indirect rule" experience in British colonial Africa showed.

(2) 2.1 According to most sources I have read as well as most herders I spoke with, there has generally been a long-term degradation in African range conditions. Floristic changes, and changes in structure have occurred throughout the Sahel.

2.2 The causes of the deterioration are not obvious. Few studies have attempted to differentiate between drought and overgrazing. Both factors vary in intensity over very short distances. It is better if range condition is considered as a very local concept (which in fact is how it was first devised).

2.3 Overgrazing might be the result of too many people, each with an insufficient number of animals, or of a tolerable number of herders with an excessive number of animals. It might as well result from the entrance of many former non-"eveleurs" into the range use system, cattle being a preferred form of investment. So, while none of these possibilities contradicts the statement, each imply vastly different approaches to reducing overgrazing.

(3) If we are talking about range livestock projects, yes. Controlling herd size in relation to the capacity of the range land is the basic problem of range livestock production anywhere in the world. The controversy is over how to achieve it. Range management is an art, not a science. It uses a lot of sciences, i.e., plant physiology, ecology, math, economics, chemistry, genetics, nutrition, et al. but in field application it is the art of fitting a put-and-take system of well understood technological factors into a relatively poorly understood ecological, political, social and economic environmental complex over which we have little or no control. The real art is to make sound, workable decisions in a milieu of uncertainty.

The more we learn and the better we understand this environmental complex the more predictable our efforts will be. The method with the poorest record of achievement is to make a few broad assumptions about the physical and social environment, accept these as gospel, and label any deviation from these assumptions as failure to apply known "superior techniques" as due to laziness, ignorance, stupidity or to politics.

The complaint that improved animal health, better water supplies and other "beneficial" measures results only in more cattle and more pressure on the range is like saying that hospitals, improved medical attention, vaccinations against disease and more food results only in more people. This overlooks the concept that no people have ever really tried to control their population growth rates while still in the hunger stage. The nomadic grazer will not be willing to reduce his herd, his only security, under a situation of great uncertainty without some other avenue of security. (The nomad with too many animals for his range and the Indian with too many children for his income are both seeking security.)

(4) I think that there is generally a great problem in the meshing of technologies developed in one region with the problems in another, since the former are often built up on seemingly objective models which in actuality are highly culture-bound. Notions of "collective ownership," for instance, are assumed to accurately depict African institutions which

planners attempt to change by altered land tenure systems; only the deficiencies in the latter changes reveal the inaccuracies in the former concepts. As often, a set of theoretical predicates based on certain assumptions are correct, but neglect several key variables which turn out to be key (such as the relationship between cattle sales and herd structure). Political objectives have always taken precedence over analysis of the systems in place, and thus assumptions are offered which lead to the desired outcome, such as the need to destock, enforce sales, alienation of land, etc.

2.1 (4) disagreement. The case for pastoral responsibility for dessication and desertification seems historically compelling, when cases in Anatolia, the Middle East, and areas of the Sahara are considered. However, increasing evidence points to meteorological shifts which may prove productive use of these land resources to be more a dependent than an independent variable in the function of ecological change. Long-term trends appear to establish the fact of degradation; however, the lack of longitudinal data on the condition of certain areas and the wide variation of range conditions over normal middle-range cycles makes such a claim difficult to establish. Probably the cases vary greatly across Africa, from actual degradation to apparent degradation which is reversible to apparent degradation which is illusory.

2.2 As hinted above the role of overgrazing in degradation appears to be a more complex issue than previously thought, which leads me to respond: (4) disagreement. In East Africa, Western has revealed degradation which is due to climatic conditions (e.g. in Amboseli), due to wildlife more than livestock, due to overgrazing but reversible, as well as due to overgrazing by livestock and difficult to reverse. The other extreme case in which rangeland has been lost to grazing by all animals due to the removal of cattle and small livestock also suggests a need for understanding the interplay of cultural and ecological factors in producing healthy rangeland.

2.3. (5) Strong disagreement. The deduction of overgrazing from a logical train leading from so-called "communal" pastures, individual herd ownership and universal propensities to maximize at the expense of one's neighbour, through lack of group systems of monitoring and unconstrained herd growth, is inadequate from beginning to end. Pastures are rarely "communal" as such, but are controlled by local groups, with their own system of resource monitoring and complementary use. The rationality of herd growth to the point of composing a herd adequate for self-reproduction in the worst, as opposed to the best or even average case, is - I would estimate - presently incontrovertible, within constraints of ecology, labour resources, subsistence needs and herd structure. It is becoming increasingly apparent that in a substantial number of cases, degradation is closely implicated with encroaching agricultural use of pastoral resources, either within agro-pastoral societies or between expanding systems of cultivation into lands marginal to agriculture but representing key dry-season pastoral pasture, and the pastoralists. In short, the problem is not with

pastoralism but with agriculture, or, more specifically, with forms of regional integration of differing forms of production which increasingly overlap in their demands on resources.

2.3.1 (2) Agreement. It would appear that labor constraints are not simply linear, in relationship to herd size, but undergo a qualitative increase over a certain herd size as substantially larger numbers of people are needed. The issue of labor must also consider the structure of the herd, for child labor useful for the tending of small stock and calves cannot cope with the comparable number of adult stock.

2.3.2. (1) Strong Agreement. Where systems of local control exist, these surely can be most efficiently used for the organizational core of range management schemes. Without such integration, one finds low-level competition between differing structures of authority and decision-making. In the Maasai case, there are four or five distinct structures of influence on pastoral behavior, including both traditional and governmental systems of political authority ("chiefs" at the lower levels), group ranch leadership and local councils, police, and various extension officers. Without the assumption that local council grazing organization was deficient and irrational, it may well have represented the basis for Group Ranch organization, as was suggested at the time.

(5) 2. The whole premise of the attached paper is that livestock projects are based on false premises. My point is that they are managed to produce repositories of value. I thus reject ecological arguments like Konczaki's and the more traditional idea that they are raised witlessly as prestige items.

2.1 In this connection I don't know whether there is long term degradation of range but the evidence seems to support this. But unlike R. Baker, I doubt this is a new thing.

2.2 I also don't know whether this degradation is a result of overgrazing but I suspect it is.

2.3 It seems also to be true that if there is overgrazing it would be connected with communal access to land since everybody's business is nobody's business.

I don't understand 2.3.1. A feature of East African herding is the low labor cost (as well as other costs). Herd size is effectively unlimited due to the existence of the stock associateship system.

I can't say (2.3.2). However it seems probable that where range land is restricted the basis exists for status hierarchicalization. Hence there is "development" without equality.

(6) Two issues are actually being presented here, one involves the assessment of the carrying capacity of a given area of rangeland, the other involves "the tragedy of the commons."

Assessment of the carrying capacity of the arid rangelands in Africa is problematic in that there is an inverse correlation between the amount of precipitation and the predictability of precipitation. As the amount of protein available to livestock is highly correlated with flushes of green vegetation which is in turn highly correlated with the amount of precipitation we have an ecological system in which the amount of protein available to livestock can vary greatly from year to year. Mobility is the pastoralist's solution to this patchy and non-predictable environment. The pastoralist is better able to adjust his management techniques to this type of environment than those who are forced into a sedentary system.

The tragedy referred to in the phrase "the tragedy of the commons" concerns the degradation of pasture. From my reading I would have to agree with the statement that there has been a long term degradation of the African rangelands. The desiccation of East Africa has been documented by comparing present water levels in lakes such as Lake Turkana with water levels in the past. East Africa has been becoming drier for hundreds of thousands, if not millions of years. There is no doubt that in particular areas overgrazing has resulted in a temporary degradation of rangelands. It is not clear, however, what the relationship between overgrazing and long term environmental degradation is. We do know that the desiccation of the arid grasslands predates the origin of pastoralism in Africa and that the issue is far more complex than we are led to believe by reading the development literature.

Issue III. Offtake rates are low in Africa because herdsmen evaluate livestock as objects of prestige and wealth, rather than as objects of economic exchange.

- 3.1 Herdsmen do not respond to market incentives.
- 3.2 They exhibit this non-responsiveness by "backward-bending" supply curves; as market prices rise, market offerings decline.
- 3.3 Demographic/ecological requirements of herds which provide for local nutrition do not encourage substantially increased offtake.
- 3.4 Nonetheless, the average cattle herd contains a far larger number of male juveniles and adults than required.
  - 3.4.1. Economic incentives rarely encourage sale of male animals until they have achieved full weight.
  - 3.4.2 Inflation, reflected in the increasing price of stock over time, suggests that a rational economic strategy is to withhold animals from the market as long as possible.
  - 3.4.3. Previously trailed steers facilitate the difficult dry season transhumance.

Responses:

Question 3. There is no sensible way of answering this in less than 5,000 words. What is an offtake rate? What is "economic exchange?" etc.

Question 3.2 This must not be confused with question 3.1. Herdsmen take a great deal of care to sell their animals at the time/place and to the buyer where they get the best price (that is the answer to

3.1). Whether the aggregate quantity sold responds to the general price level is something still uncertain (see Khalifa and Simpson in Oxford Agrarian Studies (OAS), and recent articles by Low et al in OAS and American J. of Agric Economics. Analysis, so far, of this has been far too simplistic. It is absurd, for example, to treat "herdsmen in Africa" as homogenous in this respect. The time-lag in response is also important and also whether we are talking about offtake "rates" or "numbers."

Question 3.4.2. Answer (4). It may sometimes be sensible ("rational" is too emotive a word) but "inflation" will send up price of good ornaments also. It is the "reproducibility" of wealth in livestock which is a more important factor.

Question 3.4.3. Having read conference papers my answer now is (4). I did not know this before and have not heard East African pastoralists say this.

(2) In my opinion African herdsmen evaluate livestock as objects of wealth, prestige, and as objects of economic exchange. It is not the case that African herdsmen do not respond to market incentives. Rather it is the case that African herdsmen respond to only particular incentives. I think that this can be generalized to innovations as well as to market incentives. Recent research has found that the African herdsman is not the ultra-conservative he was once thought to be. In fact the African herdsman responds readily to those innovations which he perceives as beneficial to his well being. The reason developers feel that the African herder does not respond to either market incentives or to technical innovations is that pastoralists have traditionally felt that those innovations proposed by the developer were not in his best interests. Similarly the incentives to increase offtake have not been seen as worth the risk involved in lowering one's herd size. In those instances where investment opportunities that make sense to the herder are available the pastoralists seem much more willing to part with their animals than expected. The problem, of course, is that there are very few opportunities for investment open to African pastoralists other than in more livestock.

A common observation among developers is that the traditional African herds contain a far greater number of non productive animals than is necessary. This is commonly attributed to the non-rational nature of the African herder or over concern with the prestige associated with large herds. This is most likely not the case. As J.V.D. Lewis has pointed out the presence of old males quite possibly helps in the herding process, although this finding is held questionable by some. Male animals are also slaughtered for ritualistic meat feasts, shared by all members of the community. The nutritional value of these feasts for the community as a whole has yet to be investigated. I think it would be more appropriate to say that we do not fully understand the reasons for the high number of males in the herd than to say that

there are more males in the herd than required.

(3) The notion that pastoralists are irrational is itself irrational, based neither on economic models nor accurate empirical work, but only on what appears to be low rates of offtake and the pervasive appearance of bovine imagery and elaboration among pastoral peoples. I strongly object to, and find theoretically obscure, the polarization of "social" and "economic" values, and see this distinction as an obfuscation which inevitably leads to one of two inadequate conclusions: pastoralists are irrational in ignoring economic values, or pastoralists are mechanically rational to a degree any capitalist enterprise might envy. What is viewed as the pervasive "value" and "love" of cattle is simply the predication of the entire system of production and consumption of pastoralists, the basis for, rather than the antithesis of, a mode of subsistence and life. To describe the role of cattle as capital does not refute but merely explicates one way to view the use of cattle as a repository, for example, of kinship and exchange relations. Similarly, the "love" of cattle is another articulation of their subsistence fundamentality. Therefore, I object to the phraseology of the question; as a repository of value (economic value being intrinsically social), pastoralists will not sell cattle for less value than they are seen to be worth (and of course value shifts with conditions and needs), as market agents often expect them to. But the notion that the "cattle complex" ideas are wrong, or that description of bovine symbolism is misleading, is equally inadequate, for it implies that "subsistence role" or "capital functions" are exclusive of the other institutions in which cattle and other livestock play important roles. This approach has polarized schools of anthropology is fearful of seeming to make concessions to the students of culture because of the hard-nosed economic view; in actuality, the understanding of economic processes require a comprehension of the nature of the values in question, here livestock, not a predefinition of their extra-cultural properties.

3.1. Disagree. It is clear that pastoralists respond to market incentives, one of the major drawbacks on the development of livestock industries being the control of meat prices for the benefit of the urban consumer. However, this response has its limits, as in any other market setting, in the need to adequately and securely provide for the reproduction of the pastoral herd over a temporal cycle of great climatic variation.

3.2 [I agree, but it] is not contradictory, however, to see that at the limit of market incentives a "backward bending" curve will occur, especially due to inadequate credit facilities and the relatively inelastic nature of pastoral material needs. Rather than focusing on the unwillingness to sell under improved market conditions, one might profitably focus on the parsimonious unwillingness to buy (i.e. to consume extraneous goods) and since only the payment of debts and meeting of demands follows sale - apart from banking facilities - it would not prove rational to sell, even in a seller's market. These issues are obviously complex, and it is clearly inadequate to simply isolate the interplay

of market price and offtake rates, apart from issues of overall herd size and structure, time of year, relationship to drought (and, in the Maasai case, the demands in part produced by the life-cycle of one's children, the ritual-ceremonial seasons and years, etc.)

3.3 Agreement. The myths of large surpluses of livestock have surely been shattered by recent studies on herd structure and reproduction needs and subsistence demands. Generally, pastoralists need the herds they have, but that there is an interplay between economic incentives and cutting into the fat of a herd (not a surplus herd, but a margin of flexibility and insurance) is unmistakable. In short, there are not easy solutions in the apparent contrast of surplus open to the market and minimal herd size.

3.4 Disagree. This is a key issue, and it turns on the definition in context of "required." The role of this sector in the herd is more flexible than others, but they do play several useful roles and are not simply surplus. They are insurance, representing the meat potential which will allow for survival in drought without cutting into the reproductive potential, as well as acting as "counters" in the development of animal capital. Yet, given incentives they might be more expendable than at present, as is seen during the approach of a drought when increasing numbers of male calves are culled and sold.

3.4.1. Agree. This is true in normal times, but as the chances of achieving full weight diminish - in times of increasing pressure on pastures and water resources - the curve of necessary incentives obviously shifts, as well.

3.4.2 Agree. However, the effects of inflation are rarely unmediated by governmental price controls in countries with substantial pastoral populations. The real question is, then, whether prices paid for livestock increase faster than prices paid for other necessary commodities, like maize, wheat, sugar, etc. And, given the inelastic nature of certain cash needs, a significant function of selling will not vary with price shifts. In short, inflation does not directly influence the pastoralist in daily minute ways that it might, but in significant leaps when price controls change. Clearly, when blackmarket prices vary greatly from gazetted prices, as may be true given inflation, supplies will flow to the black-market as such knowledge is widespread.

3.4.3. Agree. We owe thanks to those investigators of the symbolism of cattle, for the knowledge that oxen are the "best" of all cattle, the bovine epitome as calm, strong leaders.

Issue IV. Transhumance is the ecologically sound technique of raising livestock in semi-arid environments under conditions of available technology.

Responses:

(1) One must be careful here of the exact set up used by the grazier and whether one is evaluating the range condition, degree of utilization and trend or evaluating the livestock, i.e., a good range management

specialist might say "We can grow excellent pasture forage here if they will just keep those damned cows out of it." While a good cow man will say lets get the grass while its young, palatable and high in protein, and not worry about the stress this places on the plant for survival.

Also, if the range is grazed short the perennial grasses will regrow provided they have not been grazed too short, too often for too long a period of years. If the range is overgrazed, not only does production (i.e., tonnage) decline but perennials die out and annual grasses take their place. This is largely unnoticed because it still looks green and grassy, but annuals are ephemerals with only short term production, making transhumance even more essential. Also range grasses cropped too short produce only shallow roots - i.e., they then cannot take advantage of a water saturated profile when it is present.

The grazier is ordinarily not able to see or evaluate the slow--long range deterioration of pastures and this gets harder to do as deterioration progresses. If his grandfather could see it now he would recognize it. On the otherhand his short range perceptions are sharp and usually logical. This holds in the U. S. as well as in the Sahel.

(2) Those who criticize transhumance and other forms of nomadism surely do not doubt its ecologically sound basis, but regret its correlates, such as shifting households, tenuous encapsulation by the state (with all those implications), apparent lack of commitment to place, etc. This point is supported by the difficulty of enforcing stock movement cessation following the demarcation of grazing blocs and apparent sedentarization. Even when individual ranches were formed in Maasailand, the cattle of those ranchers were shifted onto the pasture-at-large in response to microecological shifts of forage and pasture availability. Surely, here is the stumbling block for the strategies of sedentarization and land enclosure, which are based on assumptions incommensurate with sound ecological principles but consistent with Western individualist ideology.

(3) I think that the high rate of failure among those development projects which force sedentarization upon pastoralists strongly supports Western's statement. Mobility is the primary means by which African herders compensate for the sparse and unpredictable resources which characterize the arid grasslands. The more arid the environment the more important mobility is to long term survival. By adjusting the species mix of the herding units and the degree of mobility of these units African pastoralists are able to successfully exploit an environment which could not be productive otherwise.

(4) Yes, I suppose so. But where pastoralists raise livestock in semi-arid environments under a sedentary system are they practising ecologically unsound techniques? I am sorry to nit-pick but it does rather depend on circumstances - eg, the heterogeneity of accessible pastures and the extent to which rainfall in different accessible pastures is correlated in time.

Issue V. Many pastoral societies do not have "chiefs," in the sense of individuals with authority to direct the movements and dispositions of other peoples' animals. The implication of this finding, is that pastoral livestock projects must be acceptable to individual herd managers, not merely to traditional leaders.

5.1 Decentralization of authority is positively adaptive where herd welfare is dependent on micro-ecological data processing; the individual herd manager makes decisions on the basis of immediately available information. Centralization of authority places decision-making remote from that information.

Responses:

(1) Agreement. Political structures are, indeed, not strictly hierarchical and wide consultation is necessary for the mobilization of willing pastoralists. On the other hand, the assumption that equalitarian ideology implies atomized processes of decision-making and authority does not follow. Radical equalitarianism does not imply that each herd manager must be dealt with individually, since there are networks of influence and big men exist, and "spokesmen" can enforce their own opinions. On the other hand, trying to subvert the system of influence by going over the heads of such influential men, through the government or directly to managers, can produce unexpected resistance.

5.1 (1) Strong Agreement. However, there are different types of decisions which must be made; the grazing of cattle is one level, the acceptance of destocking limits or the enforcement of group contributions to a dip represents another level, and different people must be consulted in each case.

(2) The problem with the question is "individual" herd managers. I do not think that, for example in the western world, it is sensible to let individual car drivers to determine how much alcohol they should consume before driving. Similarly I do not believe "individual" herdsman should flout communal decisions (eg, on watering rostas, keeping out of dry-season reserves). I agree that in some societies (eg, in Somali but not in Borana) "traditional elders" do not have authority to impose decisions.

(3) In East Africa the fact that the pastoralists (whom I define as societies with a ratio of cattle (or their equivalent) to people of 1 or better to 1) have no chiefs is due to the fact that they are pastoralists. This is a function of the individuality of the herders based on a high growth (inflationary) economy. Therefore it follows that you must deal with the herder on an individual basis.

5.1 I reject this analysis for reasons just adumbrated. It is not so much that decentralization of authority is ecologically sound (although it could be) but that it is sound in terms of human aspirations, the desire to be free. Again, remember that such pastoralists as the Hill Pokot, or Kipsigis, are also decentralized while living in prime agricultural land.

(4) I am in general agreement with both of these statements. It is critical that individual herders respond to micro-environmental variation in the rangeland. Flexibility and fluidity are necessary for the pastoral system to remain viable in the arid grasslands. The imposition of a rigid system may work temporarily if the particular area is experiencing a good year. In times of drought, however, a rigid system will not be able to respond to the spatial and temporal variations of exploitable resources.

Centralization of authority imposes rigidity into a flexible system, and is therefore not to be desired. I feel that for a pastoral livestock project to be successful it must be acceptable to the individual herders, as they have learned that they are the best judge of how their individual herds should be managed. This is not to say that the opinion of the traditional leaders is not important, but the acceptance of a given livestock project by traditional leaders will not guarantee acceptance by the population as a whole.

Issue VI. Shifting pastoral focus from dairying to beef production is likely to have two impacts on herding groups which are rarely identified in project papers:

- 6.1 A decline in local nutrition, as male calves increase their milk requirements vis a vis the people;
- 6.2 A decline in the status of women, who are frequently charged with domestic and market distribution of dairy produce.

Responses:

(1) 6.1 This is only true where there is a high dependence on milk for subsistence. Dahl and Hjort have demonstrated that milk as food can only be supplementary and some pastoralists, like Turu, think of milk as a marginal food at all times. Besides, you don't need to feed a calf off the mother mother than a couple of weeks and the benefits from the sale of larger beef cows would make possible replacement of milk with other foods.

6.2 Again, only where milk production is high. Not all Africans market milk. Besides, the status of women is related to their value as agricultural workers in most cases in Africa, and a shift to beef production would probably lead to an increase in agriculture among formerly nomadic or seminomadic people.

(2) I am in general agreement with both of these statements. I think that a decline in local nutrition is certainly a possibility when the subject population are pastoral nomads. It should not pose too great a problem, however, if anticipated and prepared for. A careful monitoring of the nutritional intake of the local population should be incorporated into any development project, especially those in which the consumption patterns of a group of people are concerned.

A more difficult problem to solve is the decline in status for women following the change from a milk production system to a beef production system. In a pastoral society women, in general, are in control over the household production of milk products. No comparable role is provided in the

system centering upon beef production. The end result of this could be a breakdown in family cohesion, which, in turn, could result in eventual failure of the development project.

(3) 6.2 Answer (2). But is not "labour" of women in milking sometimes more important than being "charged with distribution?" Why are they charged? Why should not the "charging" also shift to beef produce? To what extent are cultural values autonomous or am I being a "vulgar reductionist?"

(4) 6.1 (1) Strong Agreement. However, what one may find is a compromise solution as long as individual herd owners, and often women, control the countless decisions as to when the calf is pushed aside. Thus the extent to which the beef orientation will replace the dairy orientation might be qualified precisely at the point of subsistence needs, and a compromise structure produced. Of course if large-scale commercial herding replaces subsistence herding, the subsistence fate of the population may be unfortunate, unless adequate vegetable products are made available through the market, inevitably producing a nutritional decrement under that known on pastoral products.

6.2 (1) Strong Agreement. There is no sign that development helps the status of women except under conditions in which they control productive areas as in agriculture or trade. The control of milk production, consumption and sale is in the hands of women, in Maasai society, a situation which would inevitably change given commercialization of either the dairy or beef herd.

Issue VII. Embouche bovine (small farmer feeding and finishing of cattle), either alone or in combination with ox traction, may prove to be economically unviable for small farmers, even where such farmers have a tradition of investing in cattle which are then consigned to pastoral specialists for their care.

7.1 Raising of small ruminants, on the other hand, is more likely to prove economically viable.

#### Responses:

(1) These are complicated questions for which I have no ready answer. I suggest, however, that where the raising of cattle as repositories of value is primary, any attempt to introduce beef farming is a shift from pastoralism to agriculture, with all its implications.

(2) Once again I find myself in strong agreement with both statements. I think that the section concerning embouche bovine in your paper provides a good summary of those problems associated with this development strategy, and I have little to add to what you have written. I would just like to say that the problems with embouche bovine are far more subtle than the problems associated with development strategies, but just as important. The complexity of ethnic inter-relationships in a given area must not be glossed over by developers, and development strategies should attempt to

integrate those ethnic groups who have over time specialized in a particular exploitative strategy.

The raising of small ruminants is likely to be economically viable, and may in certain situations offset a drop in local nutrition in the shift from dairy to beef production.

(3) Agreement. With regard to this question, the competition for grain stuffs between livestock and people (through the market) will be key, for feeding of livestock must be competitive with alternate uses of the feed.

(4) Embouche is unlikely to be a great success unless some areas are provided to the paysan for increasing his productivity, coupled with a marketing infrastructure that pays well for the marginal improvement in the animal. (Ranches, new feedlots -- how about as Dahl & Gudron suggested, improvement of non-capitalist subsistence economies)

7.1 Small ruminants require a good deal of labor in a herd. Why should the farmer engage in this activity beyond his present level of a few goats?

(5) Answer (2) - of course - "may prove to be" is the perfect let-out. But in some cases "embouche bovine" is viable and is practiced (eg, Harar Province in Ethiopia).

7.1 Answer (4) tending to (3). Small stock have a disconcerting tendency to die when they ought not to - and this is aggravated by "sedentarisation." Also "shipping fever" (is it "pasteurellosis"?) can be a major problem in getting them to and from the "finishers."

Issue VIII. Administrative units responsible for pastoral livestock projects are not normally held accountable for the welfare of herders.

- 8.1 Project employees have little incentive to assist pastoralists or view them as constituents, since pastoralists tend to be politically marginal, belonging to ethnic and linguistic groups that are poorly represented in national administrative circles.
- 8.2 Administrative policies, such as price policy, bush fire regulations, and even mandatory vaccination of stock, are imposed without herder participation, and are viewed by them with suspicion and often hostility.
- 8.3 "Improvement of herder income and quality of life" is honored more in rhetoric than in action in livestock projects whose prime aim is to increase beef production and whose subsidiary aim, at least recently, is to slow and reverse environmental degradation.

Responses:

(1) I can't say much about how administrative units relate to pastoralists except that the literature I have reviewed, and the experience I have had in Unyaturu and West Pokot, suggests, as 8.3 says, that improvement of herder income is rhetoric. Pastoralists are a problem. They can't easily be shifted to beef production and there is no use for their traditional pastoral economy. Ranching schemes (which are uneconomical in terms of beef markets) may be a concession to pastoralists. The general feeling seems to be irritation with them.

(2) 8. Answer (2). But the colonial governments probably did it better due to the supremacy of the "administrators."

8.1 Answer (2) - but I wonder if the situation is all that different in Somalia where the alleged "causes" of the situation do not obtain.

(3) 8. (2) Agreement. But while this may be largely true, schemes are often the structures through which social services are provided. So while the administrators are not responsible for herder welfare, the structures that they manage become the centers of such provisions as do enhance welfare, such as schools, clinics, transport, etc.

8.1 (2) Agreement. However, there may be some attempt to train locals for the positions on schemes, who, nonetheless, may come to share unsympathetic views of herders. In other words, the problem of employee incentive might have as much to do with the contrast of education-levels, or hierarchical position, as with contrasts of ethnic identities. The fact is, pastoralists are difficult to bureaucratically administer or to "encapsulate;" similar problems at the level of project management and at the level of national policies can be seen in the countries dominated by the ethnic group of pastoralists, such as Somalia. This issue might be seen as another form of the class versus ethnicity controversy in the explanation of social conflict.

8.2 (2) Agreement. This may be seen as generally true, indeed, as an attribute of most governments imposing policies which are often of wider applicability than a given population of pastoralists (such as price regulations). On the other hand, when participation of a given group is solicited, the voices heard are often by the better established sector, and thus may well echo the orientation of the administration. Thus the contrast between the imposers of policies versus the hostile victims should often be refined into a contrast between divergent groups or incipient classes within the society, i.e., those who benefit and are consulted, and those who do not, and are not.

8.3 (1) Strong Agreement. Obviously a case can be made that virtually any change in pastoral societies will bring an improved quality of life, if the assumptions about the values of life of herders are not shared. The notion that involvement in the commercial sector, as producer and consumer, is intrinsically better than non-involvement, and leads to a higher quality life, meshes nicely with the aims of developing livestock production systems at the expense of subsistence herding. The hidden premise is that class formation and the squeezing out of the less able herders from the system will strengthen the pastoral economy in the long run, and thus produce better lives for those who remain. The Maasai Group Ranch project is one case in which there appears to be a compromise between the aims of developing the livestock industry (and other ancillary industries) and social welfare, all Maasai, for instance, having been registered to the possible economic detriment of individual Group Ranches.

(4) I am going to respond to these issues [8 and 9] together as they are

interconnected issues. The problem here, of course, is the historical animosity which is typical of nomad/sedentary relations in many parts of the world. It is dangerous to generalize, however, as the articulation between agriculturalists and pastoralists is a result of the integration of historical, social, ecological, and political factors. For example, we find a much higher degree of interaction between pastoralists and agriculturalists in West Africa than we do in East Africa. I think the real key to this issue, and to many of the issues of concern to us here, is common sense. In the Bakel Rangeland Development Project we are presented with a situation in which a substantial portion of the Tuareg dry season grazing land is to be fenced off and developed by their traditional enemies. As these populations are different both racially and ethnically the potential for violent conflict is certainly a possibility. Although this is an extreme example, it points out a basic lack of understanding about ethnic interrelationships in the Third World. Designing a development project in which a pastoral population is expected to trust a traditional enemy with the welfare of its herds (as is the case with inoculation teams) is clearly lacking in common sense. The ethnic relations between populations should be thoroughly investigated prior to project design for any region in which development is to occur.

Issue IX. Most livestock development projects have failed to involve the pastoralists in project design and implementation, such that they will have the incentive, means, and responsibility for maintenance, recurrent costs, and regulation of project-created resources.

9.1 Many pastoral groups have the organization and fiscal capacities to participate in livestock projects in this way.

Responses:

(1) Strong Agreement. This issue is in part moral and in part technical; in the former case, pastoralists should have a say in planning because it is they who are concerned and have vital interest in the projects, as well as the ability to frustrate project implementation, while in the latter case, pastoralists are unable to make their valuable inputs based on expertise, of use to planners, and will have little reason to materially support innovations which they have reason to believe the government wants and will be willing to underwrite. In short, it is the case that pastoralists who are not consulted - individually or as a collectivity through some form of representation - have the power in a positive sense to undermine the project and in a negative sense to retain information which is pertinent to the success of the project. "Involvement" of pastoralists is a complex issue, and may in some of its dimensions be resolved through consideration of the pastoralist perspective as elicited through research, rather than through actually forming committees of consultation, though the latter may be desirable with regard to other dimensions of activity, such as mobilization, the formation of organizations, etc.

9.1 Agreement. Most pastoralists do have systems of organization through which input can be gained, as well as resources which can be tapped given the motivation. In Maasai, giving of funds and resources for collective activities is public and involved in dynamics of prestige as much as direct economic interest; similarly, self-help programs which are in need, a category under which most aspects of livestock development do not fall. In many countries, the government (into which outside donors are collapsed) plays such a strong role in developing different areas of the

society that the refusal of local areas to give towards their own projects is a form of ethnic bargaining, in the attempt to capture a greater portion of the government pie. Pastoral investment of time and other resources into development inputs is not, then, simply a function of economic calculation or conservatism, but a dynamic process within the national and local context.

(2) It wouldn't matter if they were involved except that if they had a clearer picture, through involvement, of what the managers are up to they would be even more negative than they are.

---