

Resource Use and Management in Communal Grasslands by Pastoralists of Tanzania*

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ABSTRACT Tanzania has a vast grassland resource, which is used communally. Livestock keeping is the most important occupation in these areas, but production of livestock products is very low. This resource has been in constant use by agropastoralists and pastoralists over the years but it is gradually shrinking mainly because of its conversion to cropland, leaving pastoralists vulnerable to environmental extremes. The deterioration of communal grassland and livestock health is a matter of concern. This paper presents the prevalent systems of range use and management by pastoralists. The strengths and weaknesses of the systems are highlighted. Future areas for research and development activities are described.

INTRODUCTION

Communal grasslands in Tanzania cover over 70 per cent of the total land area of about 88 million hectares. The region forming the bigger part of the land includes Arusha, Dodoma, Shinyanga, Mwanza, and part of Kagera. These land are mainly used for grazing and supports about 13.6 million heads of cattle. Over 99 per cent of all the cattle, sheep and goats are kept by small livestock keepers in rural areas and the commercial sector accounts for less than 1 per cent (Anon., 1988). About 60 per cent of the national herd is owned by agropastoralists. The 39 per cent are kept by the pastoralists who normally keep comparatively larger per capita ratios (Ndagala, 1992). The main users of the communal rangelands are the Maasai, Barbaigs, Sukuma and Gogo. The Maasai and Barbaig who were in the past found in northern Tanzania mainly practise the pastoral system. For the past few decades they have extended all the way to the east (Morogoro & Tanga) and southern highlands (Iringa and Mbeya) regions. The other major agropastoral tribes; the Sukuma, Gogo and Nyamwezi, occupy central and north western Tanzania. Livestock production in these ar-

as is low due to shortage and low quality of forage which has resulted to low calving rates (50-70%), high death rates for calves before weaning (25-35%), a slow growth rate to mature size, and a low commercial offtake (Sullivan and Farris, 1976).

WHO ARE THE PASTORALISTS?

Tadingar (1994) defined pastoralism as any production system that relies for a substantial amount of its output on livestock. He further gave a definite pre-requisite for a system to qualify as pastoral, that, it must involve some degree of mobility. Essentially, pastoralism denotes an economy that derive the bulk of the food supply from livestock using a great variety of herding practices on natural pasture. Njeru (1996) defined pastoralists as those populations whose livelihood is largely based on animal products: milk, blood, meat, hides, skins, and fat. Hence livestock keeping is the major occupation and also the major mode of production, which is the best suited to the exploitation of the arid and semi-arid lands.

The pastoral societies are highly specialized groups like the Samburu, Borana of Northern Kenya, Maasai of Tanzania and Kenya, Barbaig of Tanzania and the Karamajong of Uganda. Pastoralism usually consists of highly heterogeneous groups in their objectives, strategies, needs, management styles and degree of mobility. Mwilawa *et al.*, (1997) observed that most of the pastoral communities (96%) in Kilosa District namely the Ilparakuyo Maasai and the Barbaig are engaged in agriculture, which serves as an important supplementary economic activity. They grow mainly maize (7%), maize and beans (22%) and beans (3%). Pastoralists are turning to cultivation as a means of diversifying

their income sources, a trend that is consistent with their decreased mobility.

CHARACTERISTICS OF PASTORAL PRODUCTION

The pastoral sector in Tanzania has a great potential for increased production and improvement of the standard of living of the pastoral communities. Despite the enormous potential, the pastoralists have been regarded by planners and policy makers as backward and irrational. As a result of these ill-conceived notions, the planners have not been able to address the traditional livestock keepers objectives, especially in the areas of risk avoidance and strategies aimed at coping with the situations.

Most of the pastoral communities keep the herd beyond the subsistence level as a capital for security against drought, diseases and other environmental changes. The large number of animals and types is also meant to maintain the tradition of the reciprocity and mutual aid in times of need in order to build up ones social and economic network, power and influence and more survival. Similarly, Ole-lengisugi (1994) reported that the Maasai do so in order to accumulate the expected level of wealth to give away as ceremonial fund and gifts on occasions of rituals, marriages and circumcisions. Niamir (1991) observed that the Maasai strives to accumulate a large and diversified livestock holding not only to meet specific objectives of the pastoral family, but also to maintain a herd size of the right composition to ensure a broader production base to meet the needs of all types of situation, given the marketing and environmental forces.

NATURAL PASTURES

Natural pastures support over 90 per cent of the total ruminant livestock population in the country. This feed resource, composed of natural grasslands, bush land and fallow land, constitutes the single most important source of feed for ruminant livestock in all pastoral production systems. Feed availability and productivity of this native grazing land resource is determined to a large extent by the rainfall gradient (Table 1). For the eastern and southern Africa region regression between annual rainfall and herba-

ceous biomass productivity was developed by Desmuck (1984), Timberlake and Jordao (1985), Timberlake (1987) and de-leeuw and Nyambaka (1987). Estimates showed that biomass production per unit rainfall in this region was twice as high as in West Africa.

Improved pastures play a limited but important role as a feed resource, especially in the more intensively cultivated high population density areas.

Table 1: The relationship of annual precipitation with rangelands feed availability and carrying capacity in area per tropical livestock unit (ITLU = 250 kg beast) (after Janke, 1982).

Annual Rainfall (mm)	Feed availability (kg Dm/ha/yr)	Carrying capacity (ha/TLU) ¹
100	-	-
200	150	15.2
300	225	10.1
400	300	7.6
500	375	6.1
600	450	5.1
800	530	4.3
1000	620	3.7

¹At 6.25 kg Dm/TLU/day (an annual requirement of 2280 kg per TLU per annum) and assuming 30 per cent forage available

MANAGEMENT IN PASTORAL COMMUNAL GRASSLANDS

In their study, Mwilawa *et al.*, (1997) reported that the Iluparakuyo Maasai of Kiduhi, Twatwatwa and Mabwegere in Kilosa district do not deliberately improve grazing lands in comparison to conventional range improvement. Nevertheless, water development, bush clearing, and protection and application of bush fires are all range management strategies well known to them. Together with the communal grassland ownership, pastoralist range productivity is sustained through livestock diversification and application of mobility strategies. Mobility represents a form of grazing rotation which automatically provides sequential grazing/resting, while bush fires are deliberately set to promote green regrowth of perennials, clear dead biomass, reduce disease vectors and check bush encroachment.

Contrary to wide spread belief, pastoralists do not deliberately cut down trees and shrubs

except for essential purposes, as they are important for their survival. They provide fodder, fuel-wood, materials for construction of houses, fences and as source of food, medicine and shade. Rarely do they fell valuable trees or shrubs, they instead collect dry and dead wood for fuel and cut less useful trees and shrubs for constructing thorn fences and to reduce bush encroachment. The other option normally used is by topping or shaking down the leaves, seeds and pods from trees and shrubs for livestock feeding. Management methods, with or without water - harvesting are desirable in areas like Twatwatwa in Kilosa district where rehabilitation of natural grazing land is needed (Mwilawa *et al.*, 1997). Reseeding by pastoral communities as a long-term solution is not sustainable.

RANGE MONITORING AND THEIR INDICATORS

Conventional rangeland resource monitoring is conducted to determine what changes occur as a result of specific management actions or practices. Tadingar (1994) reported that pastoral systems rely on detailed monitoring of range resource based on a holistic set of indicators, each tuned to few aspects of range productivity. Evaluation of rangelands is conducted periodically and during annual grazing movements. The monitoring of indicators includes observation of individual plant species, water availability; soil types, quantity and change. Also behaviour of domestic and game animals are used to judge the value of land. Presence or absence of a particular plant or wildlife species is another indicator showing that there is retrogression of the land. Oba (1994) observed that security and livestock performance indicators such as milk yield, mating frequency, dung colour do provide valuable information. Other ecological indicators used for rating rangelands include type of soil and type of vegetation, type of water source, topography and climatic conditions.

Recent observations (Mwilawa *et al.*, 1997) showed that pastoralists of Kiduli, Twatwatwa and Mabwegere in Morogoro region monitor and evaluate the quality of grazing lands through production potential of pasture types, presence or absence of individual plant species and their

palatability to different livestock, degree of forage greenness and livestock grazing behaviour.

PROBLEMS OF COMMUNAL GRASSLANDS

Most of the communal grasslands are infested with ticks and tsetse flies. The later restrict accessibility for grazing. The poor range infrastructure such as water distribution, dips, stock routes and stock trails and livestock markets together with bush/shrub encroachment and land conflict between pastoralists and farmers constitute the problems associated with communal grasslands.

On the other hand grazing land keeps on decreasing because land encroachment has taken a number of forms ranging from land acquisition for subsistence farming, large scale commercial production, National Parks and forest reserves.

WEAKNESSES IN PASTORAL RESOURCE MANAGEMENT

Similar to other African pastoral communities, pastoral production in Tanzania faces a multitude of problems, which directly or indirectly influence their production objectives and goals. The important one being Communal Land Ownership: The existing poor land tenure and land use planning policies have brought about several changes in the pastoral tenure systems in the country over the years. These are dictated by population pressure on the one hand and land tenure policy issues on the other hand. These have posed a very big deterrent to improvement of the pastoral livestock production in the country. There has been a deliberate move by the government to discourage customary land tenure system and replace it with a communal ownership system controlled by the State. This land tenure reform resulted in the disintegration of the traditional pastoral institutions and systems of management of the rangeland resource. The reform offers user rights over the land to arable farmers whereas grazing land is made communal and is open for access to all. This usually brings conflict between arable farmers and livestock keepers. The livestock keepers are

squeezed and pushed to more marginal areas and the crop cultivators take over the most fertile key sites that over years pastoralists have been managing well. The move creates a lot of insecurity to the pastoralists, and their reaction to this top-down approach has forced them to use the rangeland resource haphazardly without due regard to its conservation and management. The end result of this is misuse and/or abuse of the rangeland resource leading to extensive land degradation which pastoralists have been blamed for.

STRENGTH OF PASTORAL PRODUCTION SYSTEM

The pastoral people have made use of their indigenous technical knowledge to manage the rangeland resources. The management was based on their long-term experience of the ecological processes and a thorough understanding of the variability of the rangelands.

The "Key sites" with rich soils, high salt content and areas with suitable/highly palatable plant species are well known. Also the practice of reserve grazing pastures to be grazed during the period of forage scarcity is an important management tool. This is beneficial where season variability of the rangelands is properly utilized. The reserves may be communally owned such as "Lowindo" termed by the Gogo agropastoralists or private owned such as "Alalili/Olopololi" by the Maasai pastoralists of northern Tanzania. These areas were controlled and closely monitored by pastoral communities. Anybody who misused and/or abused them was highly penalized. The closely-knit system was guided by adherence to intricate rules and regulations on the use of the resources.

The movement of cattle herds depends on water availability and the number and type of range sites. This ensured the most proper and efficient use of the variable ecological characteristics of the rangeland and improved animal distribution thus avoiding high grazing pressures.

THE FUTURE SCENARIO FOR PASTORALISM

There are three basic interrelated trends,

which will possibly shape the future of the pastoralists and their production systems in the country. Firstly, the human population is growing at the rate of over 3 per cent per annum, meaning that in the year 2000 the human population will be twice what it was in the 1978. If livestock perform the same essential functions as today, their numbers will also increase proportionately to maintain the present status. Secondly, as land area cannot increase, the present arable grazing land of high potential use ratio in communal areas, will certainly be altered. Either the average cropping area per household will be reduced or the higher quality grazing area will be converted to cropping land in order to make room for the expanding cropping activity brought about by increased population pressure. Thirdly, capital inputs for agricultural production, particularly imported inputs will become prohibitively expensive. In pastoral areas with low and erratic rainfall regimes additional economic risks will be created.

Accordingly, research strategies should consider the following thrusts:

- Short-term strategy should aim at performance improvement, of the present livestock crop production systems through such areas as eliminating current constraints and exploiting available opportunities.
- Long-term strategy should aim at new production systems, this must be developed to manage reduced grazing areas with twice as many people and livestock. New research and development approaches to old problems must be identified if the present standard of living is to be sustained, if not improved. A Participatory Rural Approach should be the starting point to any development effort among pastoral people.
- It cannot be over emphasized that the success of all these approaches is directly related to the degree of coordination and collaboration achieved with respect to developing a holistic and effective client-focused approach.

SUGGESTIONS FOR FUTURE RESEARCH AND DEVELOPMENT AMONG PASTORALISTS

There has been conflict between pastoralists

and crop cultivators. This has brought insecurity to the farmer as a result of shortage of pasture and water. The possible solution could probably be that which was suggested by Mwilawa *et al.*, (1997), that one group can have a dialogue with the other group. Areas to graze mutually agreed upon, demarcated and stock routes maintained. This would resolve where to go and how to go there throughout all seasons.

APPROPRIATE TECHNOLOGY AND WATER AVAILABILITY

This calls for technicians and people around to be trained in handling the pastoral production system. For instance there is a need to train primary veterinary practitioners among pastoralists. There is need to mobilize the users to contribute resources required for water development. Resources such as cattle, goats and sheep could be the resources expected from pastoralists contribution.

POPULATION GROWTH

It has been realized that the pastoral population is increasing very fast and it is expected that those attaining some education would like to diversify in the lifestyle and hence technical diversification is appropriate. Issues for consideration in Pastoral development programmes geared towards improving pastoral communities should facilitate the pastoral activities and not hinder them. Programmes can be facilitated by training the communities, using institutions such as Churches and NGO's already in place in appropriate pastoral management and utilization systems, which upholds indigenous knowledge.

PROGRAMME INTERSECTOR AND CAPACITY BUILDING

It is suggested that projects, NGO's and other institutions should find ways and means of having strong collaboration in which case resources used should aim at strengthening the linkages for addressing the pastoral community problems. Since projects are not there permanently, it is important to consider the future sustainability of production in the light of the

pastoralists being self-sustaining through appropriate training.

Environmental management

Indigenous knowledge should not be overlooked but rather should be incorporated to training people to be involved in environmental management in areas that are aimed at improving the grazing areas. It is important to consider things like grazing management plans to be revived or built up again. Promoting tree in planting, protection and proper harvesting rather than cutting down trees. It is worth having demonstration plots to facilitate training of pastoralists.

CONCLUSION

It can be concluded that the most meaningful approach of examining pastoral societies is to adopt a more holistic approach tapping on several themes such as demography, examination of environmental problems and the concept of adaptive strategies. Such an approach will be fruitful only if it capitalizes on proper evaluation of indigenous range management as a necessary point of departure for development planning. Traditional range management knowledge is gradually being lost as more of the younger generation of pastoralists is getting attracted to urban areas. Yet, the traditional system has developed on initiate knowledge of the environment and many successful techniques are in place that could be used today. Traditional experiences, skills and strategies accumulated by pastoralists over the centuries should instead complement modern scientific knowledge rather than be ignored. Traditional reserve grazing practice could be one of the technology to be improved and then advanced.

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