

a glance at LinkS

LinkS project case study
No. 8 • January 2006



The role of indigenous knowledge in range management and forage plants for improving livestock productivity and food security in the Maasai communities

■ Introduction¹ ■

The Maasai pastoral communities possess an enormous depth of indigenous knowledge (IK) on animal health, forage plant and range management, which greatly increases animal survival and overall animal productivity. This knowledge is usually preserved by adults and passed down to younger generations by word of mouth, practice and social interactions among members of the Maasai communities. The Maasai pastoralists are very knowledgeable about cattle, sheep and goats and are well versed with ethno-veterinary practices and animal health care. They can describe forage plants' palatability to different animal species and can also recognize various plants' seasonality, nutritiousness, toxicity and other pharmacological benefits.

Despite its overwhelming potential, the local knowledge of the Maasai pastoral communities is not accorded the same recognition as scientific knowledge and the Maasai are not recognized as formal sources of information. The present wave of developmental initiatives that do not fully recognize and support indigenous technology will erode this long acquired knowledge. It will also make the pastoral communities lose their skills, capabilities and confidence, on which they rely for their livelihoods and food security. Appropriate policy interventions that will counter such negative developmental initiatives and give pastoral com-

munities rights and protection of their rangelands are thus essential for the sustainable utilization of resources and the conservation of biological diversity for their food security. Finally, knowledge sharing among the pastoral communities are recommended in order to expand their existing knowledge.

■ Methodology ■

The study was conducted in two Maasai villages of Kibaha District in September 2003. A combination of different methods including interviews, participatory focus group discussions, observations and guided transect/mapping walks were used to collect information from men and women. In each ward, about 20 men and women (30 % and 15% women from Magindu and Kwala wards respectively) were purposefully sampled from the 50 informants interviewed and participated in focus group discussions. Respondents evaluated the range suitability on the basis of ecological factors (forage, water availability, disease incidences, parasite infestation and presence of predators). After each discussion, smaller talks were held with women only to get their views on their role in range management, animal performance and overall decision making. Visits were made to various kraals (bomas²) during the morning milking sessions and evening sessions when the animals came back from grazing. Interviews were conducted with 'morani'³ during grazing.

¹ This case study is based on Nelson Kilongozi's (2004) "The utilization of indigenous knowledge in range management and forage plants for improving livestock productivity and food security in the Maasai and Barbaig Communities of Kibaha", Ministry of Water and Livestock Development, 2004.

² Boma: for the Maasai it is a principal unit of production comprising of various independent polygamous related families controlling a few to several hundreds of cattle between them. A Maasai boma is characterized by a cluster of housing structures and normally fenced for security reasons.

³ Maasai men between 18 and 25 years of age whose main responsibility is cattle herding.



Factors affecting livestock production

Livestock production is complex and can be influenced by many factors such as rainfall, availability and quality of water, forage plants and quality of grazing land. Although livestock is usually associated with men, women also play an important role in livestock production, as they are responsible for milking, selecting cows for breeding and looking after sick animals.

RAINFALL

Rainfall is the most important factor affecting livestock production for the Maasai. Rainfall and drought were perceived as the most critical climatic features, which have a significant impact on the productivity of their animals. The 'morani' relate the rainfall intensity and type of soils with the availability of forage. Therefore, the Maasai carefully monitor rainfall patterns using indigenous techniques (see Table 1).

Table 1 Examples of how the Maasai monitor rainfall

- The flowering of one tree traditionally known as 'engerrondo' signifies the onset of rains;
- The observation of moon shape. A crescent shape signifies rains while a full moon signifies less or no rains;
- Special sounds from a bird traditionally known as 'omdilo' signify the onset of rains;
- Temperature rise tells proximity of the rainy season;
- Accumulation of clouds signifies onset of rains; and,
- The appearance of a cluster of stars traditionally known as 'engokwa' and other stars, 'kilehenyi', 'alakiriai' and 'alakiraodoo engokwa' on the western horizon means that the rains will come soon.

The end of the rains is predicted through the onset of cold weather and by looking at the stars. Knowledge of rainfall patterns helps the Maasai elders plan the use of rangelands in order to ensure good performance of their animals. This careful use of rangelands not only ensures survival of their animals, but also the food security of the family members who depend mainly on animal products.

WATER

Due to scarcity of water, which is a recurrent problem in the study area in August and September, available water is closely

monitored and managed for livestock and human consumption. The herds are sent to different water points or split and watered in alternate days preferably starting with prime herds, calves, milkers and pregnant cows (Table 2).

Table 2 How to deal with water shortage

Decisions	Number of respondents
Split the herds	19
Water animals in alternate days	18

The Maasai have valuable indigenous techniques for predicting water availability in their rangelands. For example, high soil moisture frequently visited by butterflies is a sign of water availability close to the surface soil. The presence of trees known as 'omgaboli' (*phycus* spp) points to a high water table, while the presence of big, tall and green trees (*acacia* spp) signifies a shallow water table. Water quality is also important since bad water often contains worms that affect animal health and consequently leads to reduced animal productivity and fewer animal products on which the Maasai communities depend on as a source of food. The quality of water is especially an issue during the dry season.

FORAGE PLANTS AND PLANTS FOR ETHNO-VETERINARY MEDICINE

The Maasai's knowledge on plant identification, plants' nutritive value, biomass, cover, quality and quantity of grazing greatly contributes to monitoring the health and productivity of livestock. The Maasai are able to identify key plant species. They distinguish between those that fatten livestock and improve their condition like 'omuketya' and those that are good for milk production such as 'orpalakai' which is found in the 'omg'arwa⁴. Identification and assessment of plant species is usually based on nutritive value, vigour and animal performance. The Maasai perceive botanical composition as of particular importance in rating range suitability for livestock grazing. Good botanical composition results in high milk production and high growth rates of grazing animals. The Maasai elders agreed that a good knowledge of forage plants is particularly useful in identifying:

- dominant plant species (with respect to dietary requirements and suitability for different animal species); and,
- preferred and undesirable species (medicinal and poisonous plants).

⁴ River banks

The Maasai hold a long and established tradition of ethno-veterinary medicine. In fact, they developed a vaccination to prevent Black quarter disease (BQ) which is said to be also useful for humans. The 'morani' and adult men usually perform the treatment of adult animals while women treat young stocks and occasionally milk cows. Methods of application to animals involve:

- Mixing with feed, salt or drinking water;
- Mixing powdered extracts with oil and rubbing on affected areas;
- Wound dressing either collected sap/latex; and,
- Burning extract and delivering as smoke inhalant.

ANIMAL CONDITION AND RANGE MANAGEMENT

Generally the Maasai use their knowledge to monitor the quality of grazing and to decide the direction of grazing or on the need to scout for better pasture. This not only ensures productivity and survival of their livestock, but also enhances food security. They usually assess plant palatability on the basis of animal behaviour. They indicated that animals select and spend more time on palatable species. Desirable palatable species are grazed more and are therefore identified as those that decrease faster, thus the name 'decreasers'. Decreasers include species like 'orpalakai' (*panicum* spp), 'embejoto' and 'emurua' (*cynodon dactylon*). Good quality grazing enhances good health of livestock, milk production and growth.

Attribute	Rank
Animal performance	1
Forage availability	2
Water availability	3
Disease incidences	4
Security	5

The Maasai assess the overall grazing quality on the basis of quick animal gut fill, plant cover and the animal's condition. With a good grazing quality, the animal belly is usually full within 6-8 hours, there is an increase in milk production and the animals are healthier. The Maasai assess livestock performance using several attributes such as body condition, milk production, posture and gait, skin coat and fur, mating or birth frequency, cow dung texture and colour.

■ Breeding management ■

Improved range management goes hand in hand with the use of good quality livestock, therefore good criteria of animal selection and breeding is of high importance. Breeding management among the Maasai concentrates on the selection of breeding bulls, which is selected by the adult men. The Maasai practice continuous breeding, leaving the bulls with the cows throughout. For them, the bull cow ratio is not an issue. Only natural mating is practiced among their traditional herds. Criteria for the bull selection are:

- History of ancestors (high milk production of the mother cow);
- Big body frame;
- Attractive colour markings (*keri*);
- Good temperament;
- High libido usually shown in early stages of growth (1-2 years); and,

Bulls with unattractive colour coats, poor ancestral history, bad temperament and bad traits are castrated.

■ Gender roles and decision making ■

Leadership among the Maasai communities is traditionally vested in an age-group system. Authority is assigned to the older age groups (normally above 25 years of age) known as 'landis', 'ikishumu', 'iseuri' and 'maka'. A much respected elder known as 'laigwenan' usually leads each group. The 'laigwenan' is the chief spokesman in each of the age-group decision-making bodies, especially in matters pertaining the use and management of range resources. At times, young married men, those who are quite enterprising, are also allowed to make certain decisions pertaining to livestock production and other community issues. The herders, who have already undergone initiation, manage the boma security and livestock and are sometimes allowed to take minor decisions such as changing direction of grazing when they encounter undesirable species. The 'boma' heads usually make decisions unless communal consent is necessary as in the case of security where decisions by an individual affect the whole community.

Besides performing domestic roles, women and young girls manage home-based herds; they milk the animals, feed and treat sick animals. The Maasai pastoral women are experts

▶▶ on livestock progeny records and constantly provide advice to male heads of households about milk yield, animal temperament, maternal behaviour and fertility traits. They keep daily livestock count records every morning and evening. Women and children play a central role in animal management and range resources. Although they are not allowed to make decisions as such, women have a crucial position in decision-making processes related to milk production, some range management issues and domestic chores.

■ Conclusion ■

It is clear that Maasai communities have a sound knowledge and understanding of their environment and have appropriate managerial skills and adaptive strategies in animal husbandry and forage resource management. There is therefore a need to recognize, identify, validate and document their knowledge and management practices to integrate them into the mainstream of conventional range management and veterinary services. Even though the Maasai hold a long and developed tradition of ethno-veterinary medicine and have effective mechanisms to prevent diseases such as the black quarter disease (BQ), they have no efficient traditional cure for diseases such as 'Orkuluk' (Footh and Mouth disease), 'Endorrob' (Trypanosomiasis) and 'Olodokurak' (Babesiosis). Conventional veterinary and ethnoveterinary practices can therefore complement each other. Range management could also improve by combining and integrating local and conventional range management practices that will ultimately benefit the local communities.

This study has revealed that pastoralists are eager to learn and share knowledge not only with scientists, but also with other non-livestock keeping communities. The documented experiences of pastoral communities should be widely shared (reports and video films).

Age set	Age in years	Responsibility
Layoni	Below 18 years	Grazing calves Helping 'morani' Some enrolled in schools
Morani	18-25 years	Cattle herding Animal treatment Security of cattle and boma Scouting for forage and water
Landi	25-45 years	Overseer of development activities Decide where to graze Local herbs or modern drug use adviser Marketing of animals
Ikishumu	45-50 years	Force behind all current changes Participate in development activities
Iseuri	50-65 years	Advise on all socio-cultural issues Overseer of all farming activities
Makaa	70 years and above	Advise on all socio-cultural issues

Division of labour and decision making is an important component of livestock keeping among the Maasai. Women are engaged in all domestic chores and, as milk managers they are involved in animal selection, breeding, and treating sick animals, as well as having control over money accrued from milking. The study has shown that, although the role of women in livestock keeping is crucial, they have little decision making power. In fact, they have no legal claim over livestock and, although their knowledge and advice is valued inside the boma, they lack the opportunity to make their views heard and share their knowledge at the community level. The role of women in livestock keeping, often overlooked, should therefore be taken into account when planning development interventions.

Contact