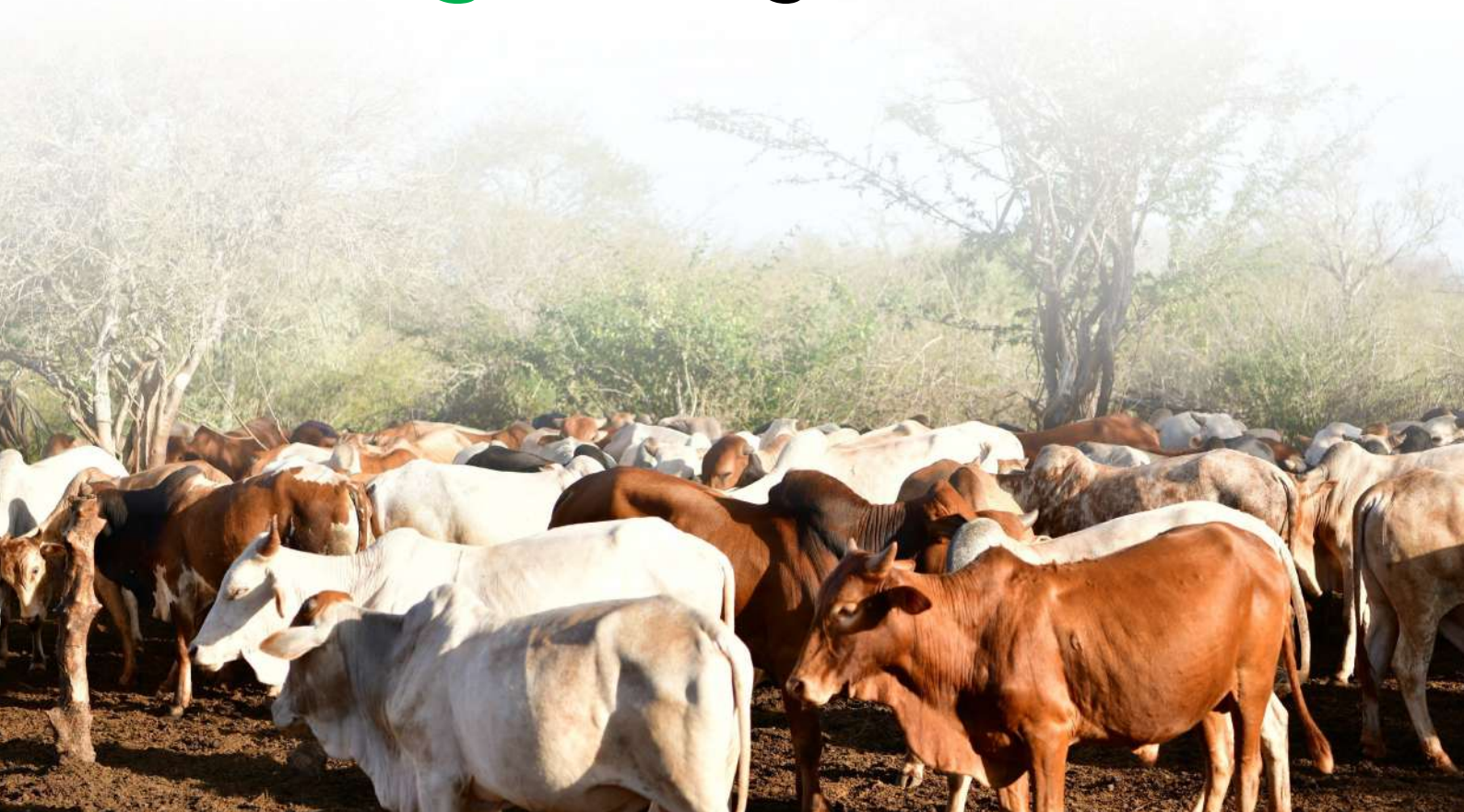




Grazing management Plan





Grazing management Plan

TAITA TAVETA WILDLIFE CONSERVANCIES ASSOCIATION

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Executive Summary

Mgeno conservancy's ability to sustain livestock production has been on a decline as a result of range deterioration resulting from poor past management actions. The degraded areas are characterized by the predominance of unpalatable and low-producing forage species and the loss of top fertile soil.

Profitable and effective ranching business is achieved through good management practices to ensure the production of livestock at the lowest cost through a good herd and forage management. Range forage management is an integral part of profitable ranching and the quality and harvest of forage produced are dependent upon knowledge of sound range management.

Grazing systems involve the interaction between the farmer, land, animals, weather, and plants. Unfortunately, farmers have no control over the weather and only limited control over forage production. To have a successful grazing system, farmers must focus on the management of the two components they can control; land and livestock.

Having grazing systems in place is important to satisfy the conservancy's objectives and meet the needs of livestock, wildlife, and stakeholders. A good grazing system manipulates animals to obtain maximum sustained animal and forage production at a low cost. Grazing systems have been designed to improve the vegetation, hence ensuring benefits like improved plant vigor and production, and improved species composition with more desirable species.

Holistic grazing systems are effective at providing long-term range improvement and high animal performance. This usually involves the concentration of livestock into one herd and allowing them to graze in a pasture for a specific amount of time and then moved to another pasture. The grazing is timed so that livestock receive a varied high-quality diet correlated with growth patterns of vegetation. This usually results in more effective maintenance and production per animal unit and for the herd. Subsequently, the grazing system allows for the regeneration of utilized pasture. This prevents overuse which is detrimental to both plants and livestock.

Acknowledgement

Climate Smart Innovations alongside good grazing and feeding systems are key to the resilience of livestock production with the ranches and conservancies in the Tsavo Landscape. TTWCA and Mgeno Wildlife Conservancy would like to extend our sincere gratitude to SNV Netherland for their Financial support and guidance provided towards the development of this grazing plan. We are thankful for the provision of expertise and technical support in the implementation of this project Without their support, the plan wouldn't have been achieved.

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CHAPTER 1

RELEVANT BACKGROUND FOR UNDERSTANDING NEED FOR GRAZING PLAN



Mgeno conservancy is one of the 33 conservancies that dot the landscape of the Taita Taveta county covering an approximate area of 53,000 acres. It is geographically located in Mwatate Sub County, Taita County and lies between longitude 37° 36" east and 30° 14" east and latitude 2° 46" south and 4° 10" south. The ranch borders Choke Ranch, Taita Sisal Estate, and Mgeno Grazers in the west in the Mwatate sub-county; Izera ranch and Teri B Ranches in the north and east, and Maungu Ranch in the south all in Voi sub-county. The ranch has a membership of about 1000 indigenous local shareholders.

The climate of Mgeno is categorized as semi-arid with high spatial and temporal variability in precipitation and temperature fluctuations. There are two rainy seasons experienced in the conservancy with an uneven distribution and the annual mean rainfall is 650 mm. Long rains are between March and May and the short rains are between October

and December (grass rains). The average temperature is about 23° -25° C. However, in the past ten years, local climatic conditions appear much more irregular and there have been two periods of extended drought characterized by strong sunshine most of the year. The coolest month is August while the hottest is February

The ranch lies in the Mwatate river drainage basin and in one of the three topographic zones of Taita Taveta, the lower zone that consists of plains with altitudes ranging from approximately 450m to 1000m. It is geologically located within the Mozambique Belt (Taita hills, Mwatate, Kasigau, and Kuranze areas). The Mwatate river forms the boundary between it and other ranches on the southern end. The topography of the ranch lies in a relatively flat plain with few prominent hills known as the Pusa and Zaghatise hills dominating the landscape. The soils are characterized by three main types of loams from moderate to low infertility with low water holding capacity.



Integrated rangeland management

Integrated management of rangelands at Mgeno conservancy includes livestock grazing management, intensive rangeland restoration, haymaking, and fodder cultivation for which so far natural, native grassland is used in portions of limited zones, and wildlife management. All management actions related to livestock grazing, haymaking, improved forage production, and rangeland restoration, are conducted for improved livestock production in the rangelands of Mgeno conservancy, and secondarily to conserve wildlife and biodiversity within the greater Tsavo ecosystem.

The grazing management targets appropriate stocking for healthy livestock and conservation of rangelands and wildlife. The approach for grazing management is rotational grazing which is

planned to use holistic grazing management based on animal days of forage available after accounting for grazing wildlife consumption. Livestock will be rotated among grazing zones according to forage availability, the need for areas to be grazed or rested from grazing is decided by the management following light or heavy past grazing and the locations of bomas and water points. Ideally, grazing management increasingly utilizes short-duration, high-impact restorative grazing, targeted resting, and targeted grazing and browsing, according to management and restoration needs.

About 200 acres are used for the production of hay, and approximately 200 bales of hay are harvested twice or thrice per year. Wildlife management is largely hands-off.

Inventory of Resources

To determine the best grazing practice for Mgeno ranch, it was paramount to take an inventory of all the available resources. This number and class of animals, for example, is important in determining how many animals will graze where and for how long. The number and location of water resources also play a major role in knowing the appropriate paddock distribution.

Total area	53,000
Grazing area	27,000
Land Ownership	Community-owned land
No of tenants	2
Total no. of Livestock owned by the conservancy	3000
Fattening stock	1700
Breeding Stock	1100
Sheep	100
No. of animals grazed by the tenant	533
Boreholes	3
Water pans	8
Employees	90
Cattle dip	2
Cattle crush	2
Weighing station	1
Loading ramp	1
Feedlot	1
Tractor	1
Disc plough	1
Movable bomas	3

Changes in rangeland health

Mgeno conservancy's rangeland health has been on the decline over the past decades due to poor management and grazing practices. The following changes are evident in the conservancy as a result. The stakeholders need to understand the drivers of these changes so that they can clearly understand the ways to reverse the situation.

Bare ground- there has been a significant increase in the area of the bare ground over the years. According to the pasture assessment report that was conducted, over 25% of the entire area is covered by bare ground. This is an indication of rangeland degradation. This is a result of overgrazing, which is a function of time and not intensity.

Reduced quality of remaining vegetation – this has been characterized by increased encroachment of invasive and toxic plants like *Solanum Incanum* which have an allopathic effect on other plants. The desirable plants are sparsely populated, with most of them being overgrown perennials

whose nutritive value is low.

The decline in water availability – The springs, water pans, and boreholes have declined in volume. This has been caused by high surface runoff, insufficient percolation, and high rates of transpiration.

Soil erosion – Obvious soil drifting, washouts, and gullies have been observed in the conservancy. This has been facilitated by reduced vegetation cover which facilitates increased surface runoff. Soil compaction in other areas has been caused by excessive trampling action of livestock.

All these factors have resulted in a fundamental change in grazing regimes, due to increased use, dependence, and pressure on grazing areas. Areas that were previously used during dry seasons can no longer be used effectively due to a decrease in forage and water availability in the grazing areas. It is for these reasons that Mgeno ranch is opting for a grazing management plan which will act as the solution towards reversing these effects.

CHAPTER 2

KNOWLEDGE FOR SUSTAINABLE GRAZING

Holistic Planned Grazing as a solution

Holistic grazing management is a structured way of using animals to regenerate pasture and improve soil health and profitability. Holistic grazing management accounts for the need for land, plants, animals, and people.

In applying holistic grazing management, it is important to understand the environment you are managing and aim to strategically mimic nature. The first step is to have the idea of returning or maintaining a land into a healthy and reproductive state by using resources readily available. This involves fewer inputs and low costs.

The system is based on a rotational grazing system but doing so at high densities for short intervals. This means that a large number of livestock is confined in a small piece of land for a short period and then moved to another piece of land. Here it is important to note the principle, that time is more important than numbers. This ensures or rather emphasizes that the recovery period is more important than utilization. Bunching of livestock ensures total forage use and manure distribution. Holistic grazing management can take many

forms depending on what each individual wants to achieve, climatic conditions, and the availability of local resources.

The livestock through actions of their hooves break hardpans on the soil and disintegrates soil particles allowing aeration, infiltration, and storage of water by the soil. Dung from the livestock provides manure and this leads to increased vegetation growth. This planned grazing system mimics 'natural grazing' by wild herbivores which results in high-intensity grazing over short periods. This leads to increased productivity of the land and it can support a larger and healthier number of livestock.

Planned grazing systems, like natural grazing systems, leads to increased pasture plant growth. The increased vegetation cover stops land degradation by reducing rates of soil erosion caused by surface runoff. It also helps in reversing desertification hence enhancing environmental conservation. Another principle that is important in this case is that bare ground is public enemy number one. This means that bare ground is an indicator of whether or not the system is working.

Holistic grazing management leads to the increased carrying capacity of land without increasing inputs. This leads to an increase in the number of livestock which increases the profits of the farmer.

The HM approach emphasizes the adoption of actions that simultaneously consider the environmental, economic, and social dimensions of any given management setting – as necessary for true sustainability.

Other benefits of using holistic grazing management include;

- More biologically active soils due to increased microbe activity.
- Removal of existing carbon dioxide from the atmosphere by sequestration by the vegetation.
- Increased carrying capacity of land due to increased production of forage.
- Reversal of desertification.
- Increased organic matter and water holding capacity of the soil.
- Reduced costs due to reduced labor and increased forage.
- Enhance resilience and reduce the effects of drought
- Enhanced profits and livelihood
- Maintain and improve wildlife habitat
- Enhanced soil carbon sequestration for climate change mitigation & adaptation

Land use and Zones

The total land size is 53,000 acres of which 27,000 acres are dedicated to livestock production, 1000 acres set aside for possibly irrigated forage crop production, and 26,000 acres for wildlife, conservation, and tourism.

The target is to expand the effective grazing area. The livestock population stands at 3000 head of cattle owned by the ranch. The first goal of land management activities is to keep ruminant livestock in the rangelands of Mgeno conservancy and monitor the interactions between grazing livestock and the environmental quality in terms of wildlife conservation, biodiversity, livestock-wildlife coexistence, and the dynamics and resilience of rangeland ecosystems. This includes improving the quality of rangeland habitats as appropriate through the restoration of portions of the rangeland including restorative livestock grazing, targeted livestock grazing, resting from livestock grazing, the use of holistic mobile bomas to restore soil fertility, and intensive restoration efforts such as reseeding, reduction/removal of encroaching shrubs and management of natural regeneration.

The second goal of land management activities is to provide and maintain high-quality rangeland habitat in Mgeno conservancy for resident and migratory wildlife supported by international and national wildlife tourism. By doing so the ranch earns carbon credit through the US-based Wildlife Works organization.

A smaller piece of land is used for the administration facility and housing of the rangers and other staff.

Zonation

In order for sustainable land management, it is imperative to have a zonation Scheme that depicts different uses of different areas within an area with different use-values. A zonation Scheme ensures efficient management of Conservancy land by encouraging compatibility between various uses.

Mgeno Conservancy has a zonation Scheme as depicted in their Integrated Wildlife Conservation Management and Action Plan 2020-2030. According to this plan, The high Use Zone was decided upon for intensive use which includes livestock grazing and wildlife viewing tracks throughout the area. The area consists of open grass and bushlands.

The area has long been used as an open pasture by both livestock and wildlife with water provisions and livestock bomas interspersed. However, from the pasture assessment and general observation, it was noted that the majority of the conservancy was degraded. This includes the low use zone, development and administrative zone, and Special use zone which were not necessarily purposed for livestock grazing.

Methodology

Meeting with the board and stakeholders to identify and define priority areas that have been degraded and areas to be used for grazing. The approach was participatory and all the suggestions came from the stakeholders. It was agreed upon that; the use of holistic grazing management was the best management action to help reverse the degradation that has occurred in a large part of the conservancy. This would therefore involve having the grazing areas across the different zones to ensure that livestock impact the whole area.

Evaluation and definition of different function zones based on existing zonation plan. Through engaged discussion, the stakeholders agreed on using the resources and structures available. Water resources were distributed throughout the ranch and pasture was available in different zones including the special use zones and low use zones.

Deciding on utilization criteria. Livestock grazing in the different zones would require a criterion to efficiently utilize the pasture and have maximum impact on the area. This involves planned movement which is achieved through paddocking. However, instead of having physical barriers between regions, the stakeholders agreed on using cutlines and roads across the conservancy to separate the different paddocks. The paddocks are distributed across the different zones and are subject to change with every season as deemed fit by management.

According to the paddock quality, which was determined by the availability of pasture and water resources, risk of predators, and general accessibility of the area, the paddocks were assigned to cater to either the breeding stock or the fattening stock. This was as a result of agreeing to have two management herds.

All the maps layers indicating the paddocks and cutlines separating them were created in the

shapefile format using a coordinate system. The system also allowed for the determination of the area of each paddock which was important in determining the period that livestock could graze in the said paddock.

Recommendations

Review and readjustment of the zones after every season or two, will be very helpful for the management of the conservancy and to help achieve the objectives of the grazing plan.

Although the boundaries are clearly depicted on the map, it would be important for the head Bomas and herders to clearly visualize and understand the boundaries for each paddock, to avoid trespassing into a different paddock.

In the subsequent seasons, the paddocks that were as sacrificial Paddocks should be reallocated to ensure uniform utilization of all the areas to allow for effective regeneration of plants.

After a while, the ranch could decide to restrict the grazing plan to the high use zone only. This would require the re-establishment of different paddocks which would only cover the said zone. However, at that point, the ranch should be in a position to produce quality and quantity of pasture for the available livestock as a result of a holistic grazing Strategy.

Practical aspects required for success going forward

Develop the management grazing plans that enhance good grazing practices

This involves having a seasonal grazing chart that guides the utilization of pasture.

Rehabilitation interventions where needed e.g., bush control, pasture reseeding, and gully repairs

Grazing by-laws that apply to tenants and community

Building Institutional capacity

grazing management bodies who will act as coordinators to ensure the grazing plan is followed.

Users and Implementers (livestock owners, managers, herders).

Roles and responsibilities of all entities relevant to grazing.

Involvement in and/or awareness of all bodies and community-at-large of the upcoming season's grazing plan

Build natural resource management capacity of grazing managers

Involves educating them on;

- Basic land principles - how land functions: Ecosystem Processes.
- Available tools for Management & how they affect the ecosystem
- Basic components of planned grazing.
- Practice their roles and responsibilities.

Monitoring and Learning

A simple monitoring protocol was put in place to be implemented by the conservancy.

This involves livestock condition and soil impact monitoring on daily basis; and biological monitoring over the longer term. All of which should be internalized within the conservancy so that they can adjust their management accordingly.

CHAPTER 3

GRAZING PLAN & IMPLEMENTATION

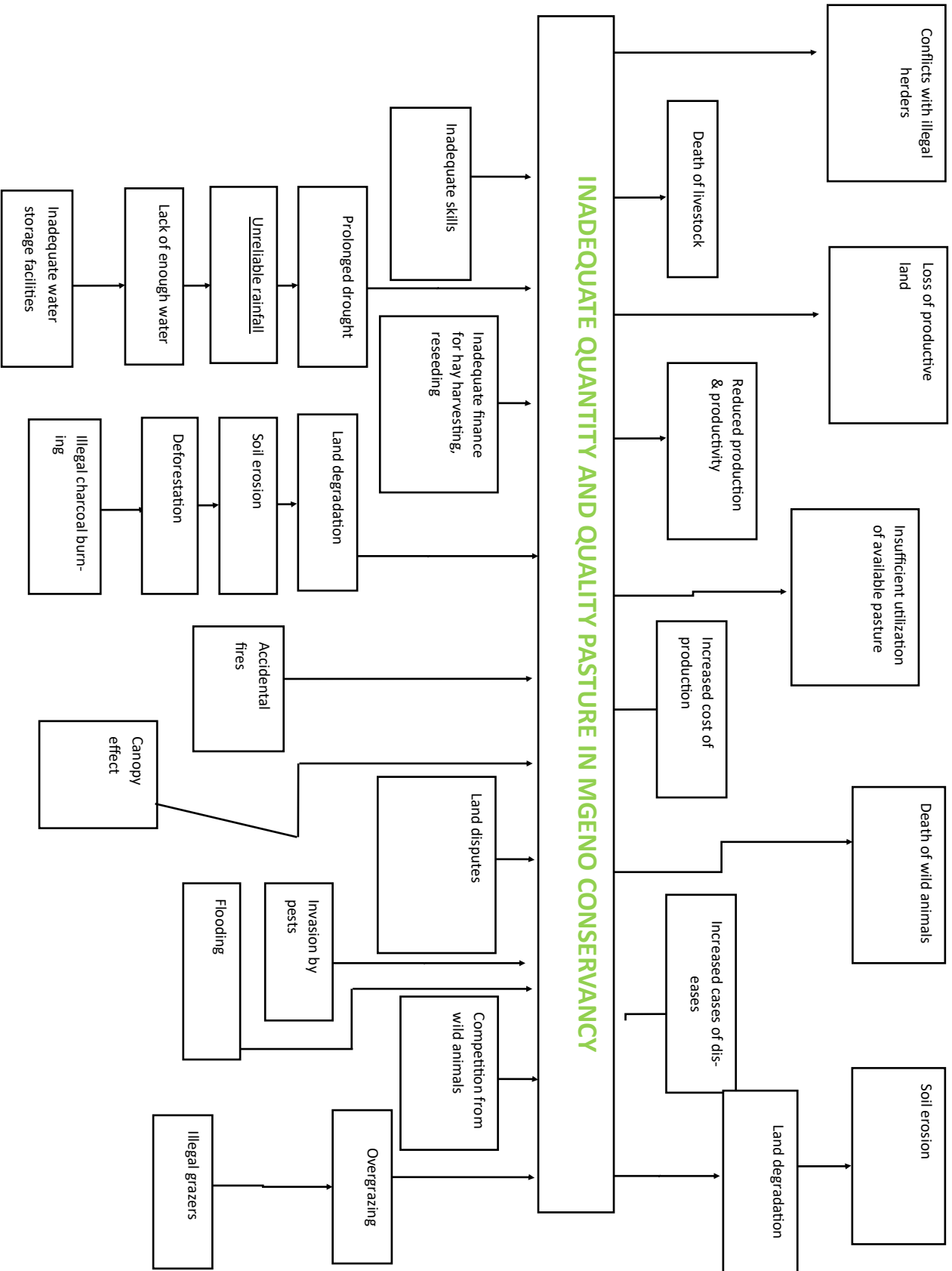
Goals & Objectives

The development of the grazing management plan seeks to improve the social, economic, and environmental aspects of Mgeno conservancy. To determine the different goals that Mgeno ranch wanted to achieve through the grazing plan, an analysis was done to document the problems, causes, and objectives.

A problem tree analysis was done to determine the challenges facing Mgeno conservancy and the causes and resulting effects. After deliberate discussions with members of the ranch, the following resulted.

Figure 1: Facilitators and the participants taking part in problem tree analysis





From the analysis, it was decided by the members that a grazing plan was paramount in order to help address the challenges. The purpose of the grazing plan, therefore, is to ensure strategic planning of grazing activity to facilitate the success in the following areas;

Environmental

- Increase forage production and increased number of perennial grasses which can sustain livestock through the non-growing season.
- Reduced rate of soil erosion due to increased soil cover
- Increase accessibility to water as a result of the rise in the water closer to the surface bed.

Better soil conditions allow increased water infiltration, aeration, and reduced evaporation and surface runoff.

Economic

- Improved livestock production due to improved nutrition as a result of the availability of forage all year long
- Reduced theft and predation as a result of herding livestock together and placing them in movable enclosures at night.
- Better market prices as a result of better weight gains.

Reduced rate of livestock mortality as a result of inadequate forage during the dry season.

Social

- Cohesion as people start working together.
- Better communication between management and its employees through the decision-making and planning processes.

Learning skills (e.g., planning) that can be used to tackle other issues in the community.

Scope of the **Grazing Management Plan**

The plan is founded on the philosophy of appropriate stocking and pasture utilization for healthy livestock and conservation of rangelands and wildlife. This is in line with the goal of high-impact restorative grazing to break soil crusts, enhance soil fertility and pasture production, and limit invasion by unpalatable shrubs.

The grazing management approach at Mgeno is adaptive rotational grazing. Mgeno conservancy has 2 herds; breeding stock and fattening stock. The plan, therefore, aims at establishing 12 paddocks, 7 for fattening stock and 5 for breeding stock. Different plans and schedules will be made for each stock during each season.

The plan primarily focuses on Natural Resource Management, especially to improve rangeland management and condition, whilst enhancing the capacity of the ranch to be competent to undertake good decisions that correct the poor practices that have led to land degradation. The plan will therefore be implemented in the entire ranch to enhance restoration of all areas across the conservancy.

The duration of livestock in each paddock will be dependent on the paddock quality, characterized by water availability and the amount of forage in the paddock. The paddocks will be grazed in a strip system, allowing the movement of animals from one section to the other according to the days they are supposed to be in the paddock. The system will also involve having one sacrificial paddock that will be used to house sick and injured animals which will not be part of the main herd.

The grazing plan also adheres to the rules of range management which include;

- Balance number of animals with available forage supply.
- Obtain uniform distribution of animals across the landscape
- Proper kind and classes of animals (best suited for the forage & objectives)

Alternate periods of grazing and rest to manage and maintain vegetation.

Overview of **Holistic Planned Grazing Principles** and **Processes**

Grazing is a natural disturbance to which many rangeland plants are adapted. The effects of grazing depend—like those of other disturbances—on timing (when they happen), intensity (how severe they are), and frequency (how often they recur). Grazing can be managed in these three terms.

HPG is a grazing planning procedure that helps to get the livestock to the right place at the right time and for the right period of utilization. Grazing planning involves the manipulation of time (of grazing), area (of land), and numbers (of animals) while catering to numerous variables related to management and weather. Planning is critical to achieving sustainable grazing and avoiding overgrazing. Not only does good planning improve management, but it also provides a greater sense of control over one's livelihood, which can be an important boost to morale in a business characterized by uncertainty and risk.

When managing holistically, one is using grazing as a 'planned event' that is enhancing one's desired social and economic ecosystem. When properly executed, grazing will encourage the development of living organisms and enhance biodi-

versity, leading to true profits for an entity. A grazing plan is drawn up by livestock owners and herders together to discuss moving animals to the right place, at the right time for the right reasons. It helps to meet the needs of livestock, wildlife, soil, plants, and people.

Holistic planned grazing is a process that changes according to the change in weather, economy, and people's needs. This, therefore, means that the plan is not a one-time thing, but has to be adjusted periodically. This allows determination of where you want animals to graze, for how long, and for what reasons.

Livestock is the main tool in holistic grazing for the repair of land and regeneration of plants. The system, therefore, advises for bunching of animals into a single herd. When animals are bunched, it is easy to plan for their movements and they can be able to restore grass and soil fertility easily and effectively. This is because a single herd will easily chip the hard surfaces of soil and trample down overgrown vegetation to facilitate aeration and water percolation for plant growth. Having many herds makes it difficult to plan their movement. This leads to overgrazing and shorter recovery periods for animals.

Development of a Grazing Plan

Steps in developing a grazing plan

Conduct a resource inventory (including pasture assessment)

Define goals and objectives

Map out the area

Divide the land into paddocks

Process of planned grazing

- Determine the size and mix of animals
- Decide where animals temporarily separated from the herd will graze
- Set up grazing chart
- Note times that are important and areas that require special treatment
- Record animal numbers
- Plan recovery periods
- Rate quality of each paddock
- Calculate the average grazing period for each paddock
- Plot the planned days the herd will be in each paddock
- For the non-growing season; check the plan to make sure the forage will last

Other important factors to note

Livestock should be placed in one management herd. This ensures healthy, safe, and productive

livestock and keeps plants and soil healthy. The concentration of animals allows for planned movement which allows the effect of their hooves and grazing on the soil and plants. When herded according to plan, one large herd is the easiest way to improve land, and natural water sources and increase the carrying capacity of the land.

The provision of plenty of water is ideal. Animals in one large management herd need to be able to drink enough water to meet their needs over a short period every day. If there isn't enough water from springs and water pans, it may be important to build troughs, water tanks and pump water from boreholes or wells

Create sacrificial corridors. These are pathways that will be used by the herd to move to water points, handling facilities, and nightshades. The use of these particular pathways will ensure uniform utilization of forage and discourage unnecessary trampling. The pathways may also act as firebreaks.

Keep the management herd in movable enclosures at night. The enclosure provides protection against predators and thieves. The bomas can be used to rapidly heal bare land and can also play a role in decreasing the burden of internal parasites.

Grazing Strategy 1: Deciding the grazing area and period

The ranch having two herds (breeding and fattening stocks), decided on having 12 paddocks, 7 for fattening and 5 for breeding bstock to be grazed on during different seasons.

The calendar of the seasons is as follows;

- Short Rain Season 3rd week of October- 4th week of December
- Long Rain Season 3rd week of March to 2nd Week of June
- Short dry season 1st week of January to 2nd week of March
- Long dry season 3rd week of June - 2nd week of October

Grazing map and blocks

A map indicating the paddocks and available water resources was developed and agreed upon through a participatory approach.

The blocks were ranked according to their quality which was determined by the availability of desirable pasture, water resources, and safety of livestock. For the upcoming short Rain Season, a grazing chart was developed for both the stocks.

However, for each season, the grazing committee will ensure shift of the paddocks between the stocks and the current blocks is not cast on stone for all grazing seasons.

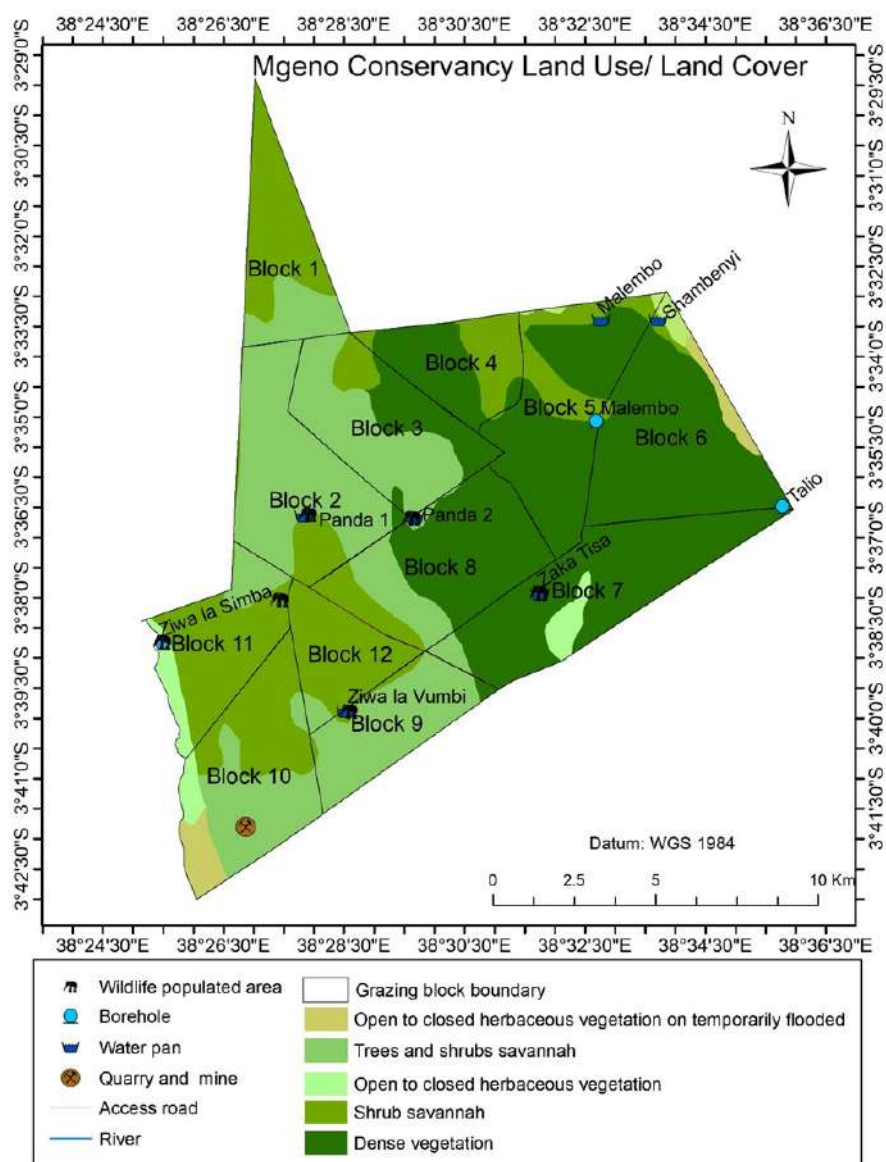


Figure 2: Mgeno conservancy grazing blocks

Fattening Stock

	Paddock	Size (acres)
Block 1	Mgeno City	3370
Block 2	Panda 1	5260
Block 3	Kapala	4741
Block 4	NYS	2745
Block 6	Talio	6128
Block 11	Ziwa la Simba	3570
Block 12	Pusa	2363

Breeding Stock

	Paddock	Size (acres)
Block 5	Mishingenyi	5396
Block 7	Zaghatisa	5759
Block 8	Twiga	5344
Block 9	Ziwa la Vumbi	3054
Block 10	Mali ya Mungu	5223

Wet Season Plan

The wet season is also known as the growing season is when there is plenty of rainfall which results in the germination and growth of pasture. The wets season plan is developed before the end of the long dry season or short dry season. During this season, the pasture should fit two requirements;

- it must appropriately meet the feed demands of the animals at hand.
- it must allow for building a stockpile of pasture for consumption during the dry season.

Recovery periods refer to the length of time grazed forage need to recover. The periods may be shorter or longer depending on the severity of the damage to the plants. The faster a plant grows, the shorter the recovery period it requires, and the opposite is also true. By bunching animals and having them graze at one section at a time, other grazing sections can be given time to recover.

Figure 3: Wet Season grazing schedule

HOLISTIC GRAZING PLAN FOR MGEND CONSERVANCY												
YEAR... 2022												
WET SEASON PLAN												
1. Months	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
2. Rainy Season												
3. Actual Rain												
Paddock Quality Rating	[Green shaded area]											
Paddock Names/Numbers:												Grazing Period
Fattening	Mgeno City & Twiga 3/4											
	Panda 1 7											14 days
	Kapala 6											12 days
	NYS 4											11 days
	Talio 8											15 days
	Ziwa la Simba 10											17 days
	Pusa 5											12 days
	Mishighenyi 5											12 days
	Zaghatisa 7											17 days
	Ziwa la Vumbi 10											22 days
Mali ya Mungu 9											20 days	
4. Number Herds			2/1	2/1	2/1	2/1						
5. Number Paddocks			6/4	6/4	6/4	6/4						
6. Recovery Period			60 days	60 days	60 days	60 days						
7. Average Grazing Period			12 days	12 days	12 days	12 days						
8. Livestock Total												
9. Bulls			1000/43	3000/66								
10. Cows			276	976								
11. Steers			220	44								

The Wet season is expected to begin on March 11th and end on May 31st i.e., 81 days. The two stocks will move through each block only once during that time. Traditional visual assessment of the forage will also be important to inform the decision.

In terms of implementation, the fattening stock will start in Panda 1 for 14 days, then move to Kapala for 13 days, then NYS for 11 days, then Talio for 15 days, then Ziwa la Simba for 17 days, then finally to Pusa for 12 days. During this period, the animals will utilize different sections of Paddocks each day i.e., graze in strips. The herders should also make sure that the overgrown plants which have not been consumed in a strip have been trampled on. During this season, Mgeno City will be used as the sacrificial paddock. The livestock will be housed in the movable bomas to enhance repair of land and distribution of manure as well as protection against predators

For the breeding Stock, they will start at Mishighenyi for 12 days, then move to Zaghatisa for 17 days, then to Ziwa la Vumbi for 22 days, and lastly to Mali ya Mungu for 20 days. Twiga paddock will be used as the sacrificial paddock for this season. The recovery period for all the paddocks is estimated at

60 days. After the wet season has come to an end, the grazing Committee will develop another grazing plan for the dry season. The order of Paddock utilization will be rearranged and other sacrificial Paddocks chosen.

The main issue that could emerge during this season would be the abandonment of lumping of animals by herders especially because forage is expected to be more. However, this will lead to overgrazing- due to preferential feeding by the animals and continued degradation of the paddocks. This therefore should be discouraged to ensure that there isn't pressure on the grazing blocks during the dry season. The herders will also be encouraged to broadcast seeds in the degraded areas which have been acted upon by livestock. The herders will graze the herds in shifts as per their herding schedule as informed by the head boma and manager.

The recovery period for each paddock is 60 days, before the onset of the dry season plan. In the implementation of the dry season plan, the order of Paddocks to be grazed on should not be the same and the sacrificial paddock should also be different.

Dry Season Plan

The non-growing plan starts when plant growth stops due to the normal end of the wet season or the early end of the wet season due to drought. In this season no forage is in production. Running out of available pasture is a common occurrence during this period, and hence it is important to have a plan. In this season it is important to make sure that animals get the best available forage when they need it the most (such as when giving birth) and to trample the soil crust and dead plant material on the ground. This helps fertilize the soil with plant litter and seeds are down by the hooves before the onset of the rain season.

The dry season plan emphasizes stock numbers and ensures they match available pasture, as the pasture cannot be varied. One must, therefore, accurately assess block by block how much forage physically exists to determine how many livestock can be accommodated. Talio paddock (see figure2) was proposed for pasture development, hence pasture from this paddock could be harvested during this period. When calculating time, the expected period before normal return to active growth plus a safety valve which is a reference to as the drought reserve should be considered.

Grazing Strategy 2: Control movement of Livestock from other zones

To achieve this strategy, Mgeno conservancy needs to raise awareness by holding meetings with neighboring communities and tenants. This will also involve discussions with the tenant on where livestock will be grazing at a particular time, especially during drought seasons.

This will ensure that the number of animals grazing is according to the required stocking rate to prevent overgrazing.

Grazing Strategy 3: Pasture reseeding

Pasture reseeding is a strategy to ensure that there is sufficient pasture all year long to sustain livestock production. This will be achieved through the broadcasting of seeds by rangers and herders in the degraded areas. This will ensure that as the livestock break the hard soil crusts, the seeds can germinate during the rainy season.

Pasture production in pasture plots will also ensure that there is enough reserve for use during the dry season. Grasses such as African foxtail and panicum maximum could be reseeded.

Grazing Strategy 4: Sensitization of benefits of holistic grazing and its impact on rangeland health

This will be achieved through management engagement, community engagement, and workshops with TTWCA on rangeland management. This will help in ensuring that there is an understanding of the importance of planned holistic grazing among the members, and neighboring communities for sustainable utilization of available natural resources.

Challenges in planned grazing

Some of the challenges foreseen include resistance to adherence to the plan. This is because planned grazing may require a paradigm shift away from conventional grazing regimes. Having larger herds of cattle working together may require changes in management, infrastructure, and animal husbandry techniques. Regular monitoring and accessing of the animal's health is important

Management Units, roles, and responsibilities

The holistic grazing management plan was developed through a participatory approach and included the executive board members, ranch manager, head bomas, herders, rangers, and livestock officers. These are key stakeholders who are conversant with grazing regimes and strategies in the area. This approach, therefore, made sure that all their views and suggestions were incorporated to ensure the development of a standard grazing plan. This was done mainly to address the issues of inadequate resources for utilization by livestock, including pasture and water which is caused by poor management of available resources.

Grazing Committee

This is the management unit that takes the responsibility of implementation of the plan. The committee is made up of;

- Ranch Manager
- Livestock officer
- 4 Head bomas
- Head of General works
- Lead Ranger
- Range Officer

Roles and Responsibilities

Herders

These are one of the most important personnel in the implementation of the grazing plan. Their roles include;

- Advise grazing committee on the best way to prepare grazing plan.
- Ensure livestock movement is according to

the plan; adherence to set plan

- Report cases of non-compliance by other herders and illegal grazing by outside communities.
- Help in monitoring and reporting of agreed indicators
- In charge of moving and placement of holistic bomas

Head Bomas

- Train, coach, and monitor herders
- Plan and implement herding shifts
- Keep herd records
- Provide support to ranch manager on the development of seasonal grazing charts
- Attend grazing committee meetings and report on progress and problems

Ranch Manager

- Help in the development of seasonal grazing chart
- Ensure the welfare of herders is catered for
- Oversee and manage all grazing issues pertaining implementation
- Arrange for annual assessment to measure progress and report back to the grazing committee

Livestock Officers

- Provide veterinary services.
- Advice during the development of grazing charts
- Oversee and manage all grazing issues pertaining implementation

Grazing monitoring



Monitoring involves the orderly collection, analysis, and interpretation of resource data to evaluate progress towards meeting management objectives. This process needs to be conducted over time to determine whether or not management objectives are being met. It allows the provision of measurable statistics that allow one to determine the effect planned grazing has on the pasture and health of the land in general. Includes determining trends or changes occurring in the condition of the grazing areas. Monitoring allows for the incorporation of knowledge learned from one process into the next stage. It also informs on what strategies are working best and which one needs to be changed.

Monitoring also allows for the realization of possible mistakes hence minimizing the consequences. It also helps prevent misinterpretation of success.

The parameters to be monitored include;

- Livestock health
- Animal performance - includes weight gain, % calving, breeding success.
- Biological components - plant vigor, % invasive species, plant density, soil condition.
- Wildlife - Distribution and density of wildlife.
- Implementation of the plan - actual Vs planned.
- Adherence to the grazing bylaws- adherence by the tenant, herders, and community to the bylaws put in place.

The grazing committee will be responsible for the monitoring led by the Range Officer and Livestock Officer. Reports will be done on a monthly and quarterly basis.

Conclusion & Recommendations

Preparation of the grazing plan was done involving a participatory approach. The stakeholders of Mgeno conservancy were involved and their suggestions, opinions, and views were key in the development of this grazing plan. During the meetings, the grazing plan committee was equipped with skills to develop grazing charts and they are in a position to develop a grazing chart for the upcoming seasons.

From the pasture assessment, it was evident that the available pasture in Mgeno was not sufficient to meet the nutritional requirements of the available livestock. The grazing plan will therefore help in ensuring that there is enough pasture for animals all through the year.

There is a need to mentor the grazing committee to ensure that they can continue designing and implementing grazing charts for future seasons without outside help. The herders also need to undergo training to ensure that they are in a position to implement the grazing plan efficiently.

It is imperative that there is ownership of the plan by the ranch to ensure its success. Ownership and acceptance will lead to easy adoption and facili-

tate the success of the plan.

Enhance grazing governance by drawing up community-designed grazing bylaws that are Cognizant of traditional knowledge and practices and conventional laws to govern the implementation of the grazing plan.

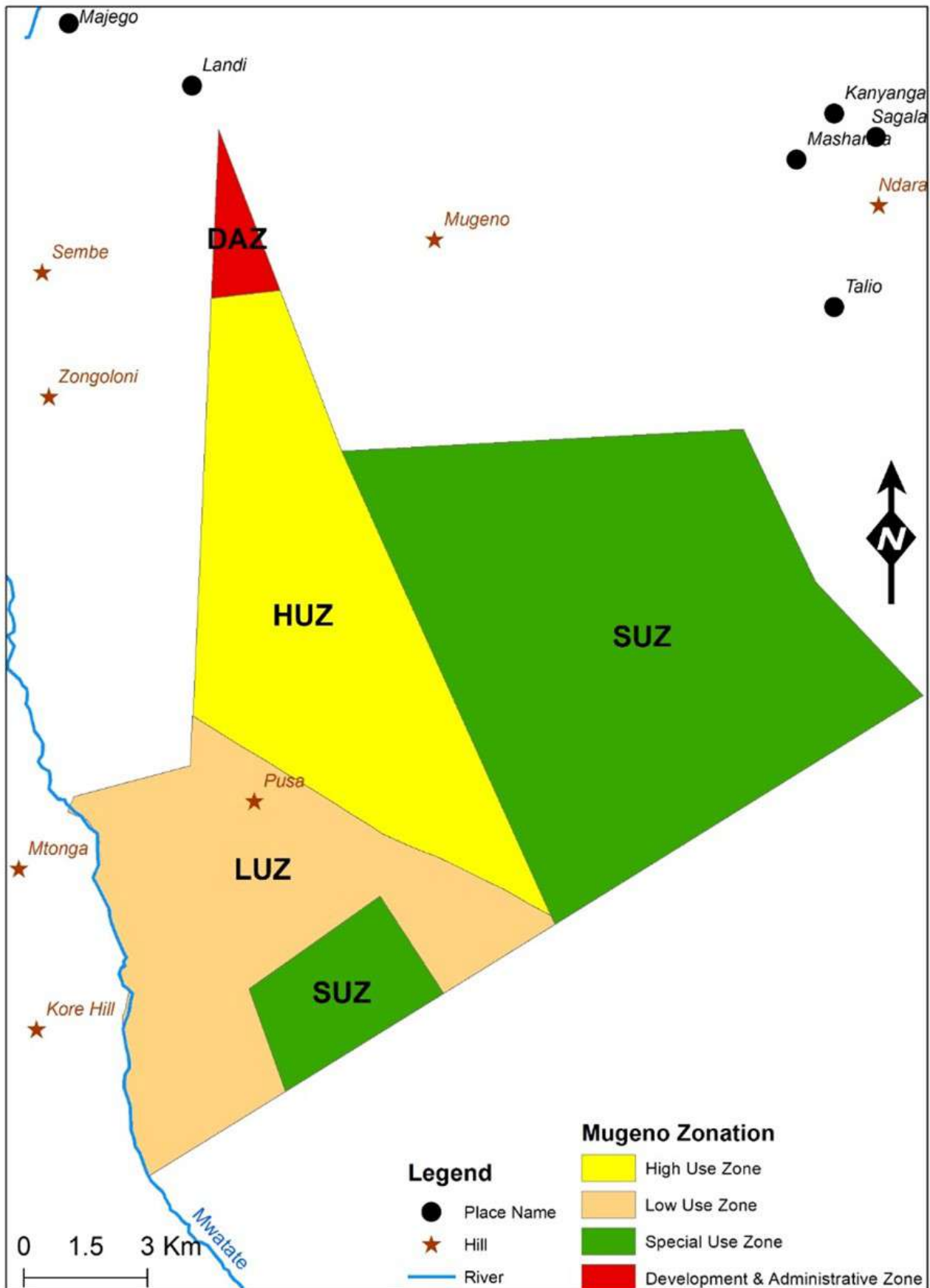
Continuous review of the grazing plan to accommodate changes, and in line with different seasons and availability of forage in the different paddocks.

It is also critical to raise awareness on the issue of overgrazing during the wet season. The plan should be followed religiously to avoid the issue of overutilization of pasture resources during abundance.

Mgeno conservancy management should provide the necessary support to the implementation of the grazing plan, including the facilitation of the needs of the herders.

Resources like boreholes which were proposed to be established and expansion of water pans need to be facilitated fast enough to ensure the success of the plan. This is through ensuring animals can be restricted to one paddock as desired with enough water resources in the said paddock.

ZONATION MAP



GRAZING BYLAWS

Grazing by-laws are important in ensuring proper regulation and coordination of grazing activities and processes. They help in enhancing social coherence and management of pasture resources. The by-laws are subject to adjustment and ensure that the community's capacity to adapt to change is increased to ensure the restoration of degraded rangelands.

The rationale for having grazing by-laws

- Unclear rules governing encroachment of livestock from other communities into the conservancy
- Low levels of awareness among the community on the need to manage grasslands
- Ensure management of neighboring communities in search of pasture and water, especially during the dry season.
- Harmonized grazing conditions are key to rangeland health

Prevent misunderstanding of grazing management as a way of denying grazing rights.

The Bylaws

1. Grazing coordination in the grazing zones

- movement of livestock from one grazing block to another should be authorized by the grazing committee, following the grazing chart.
- livestock should stay in a particular grazing zone for a set number of days unless advised by the management/ grazing committee.
- Trespassing to another grazing block before a set time is punishable by a fine or warning as deemed fit by the grazing committee.
- Grazing in the paddocks should be in strip format to ensure uniform utilization of pasture across the entire paddock.

During the dry season, bomas should relocate every 7 to 14 days to boost the productivity of the areas through animal impact.

2. Water point management

- Corridors for accessing water points should be well mapped out and used consistently to prevent the formation of hardpans in other areas through the movement of users. Failure to follow the routes will be punishable by a warning or fine as deemed fit by the grazing committee.
- The grazing committee shall have the right to restrict/ control the use of water points for the sake of development or repair of the points in line with the implementation of the plan.

Water sources for wild animals are to be protected always.

3. Management and Control of tree destruction

- It is the role of every member of Mgeno ranch to protect and preserve indigenous tree cover in the area.

Cutting off live trees in the conservancy is not allowed and is punishable in accordance with the conservancy rules.

4. Poaching and Human-Wildlife Conflict

- Poaching is illegal in the country and offenders will be prosecuted in line with Wildlife Management and Conservation Act 2013.
- Herders shall ensure animals are in movable enclosures at night to reduce the risk of attacks by predator

In the event of attacks by wildlife, the victims shall file for compensation to KWS in line with Wildlife Management and Conservation Act 2013.

5. Adoption of the grazing plan

- The tenant and community grazing their livestock in Mgeno ranch will be subjected to all the grazing rules and penalties.

The grazing committee will ensure compliance and adjustment of all the members.

6. Inclusivity in the grazing plan

Representation of women and youth in the grazing committee

Replanning for **when disaster strikes**

Disasters are inevitable and hence it is important to be ready for them. Events may occur that require the grazing plan to be changed during the year. When disasters like fire, invasion of armyworms, or severe back frost all of which lead to a great decrease in quality and quantity of forage- grazing needs to be completely replanned. Adjusting the plan may not be sufficient and hence need to develop the plan afresh.

Note the following;

Drought - during very dry seasons, scattering animals will make the conditions of the land worse. Live-stock conditions will also deteriorate due to inadequate food. Moving animals as a herd and having them graze through a thoughtful plan will give them a better chance of having sufficient food. Additionally, the herd will continue to prepare the land through the action of their hooves to facilitate the recovery of the soil and allow better absorption of moisture during the rainy season.

Replanning allows for frequent movement of animals across the paddocks. Drought reserves may also be useful during these periods until the beginning of the rainy season when farmers can create the growing season plan

Fire and Insect Outbreak - if a fire burns through many paddocks, the grazing plan would have to be redone based on the changed situation. In this kind of replanning, all the burned-out paddocks would be marked as not available until growth can occur. Insect invasion that removes all the forage from one or more paddocks would require the same re planning effort.

OBJECTIVE	BASELINE INFORMATION	PERSON RESPONSIBLE	SPECIFIC ROLES	TIMELINE
Formation of the grazing committee (9) by July 2022		Manager, Livestock officer, Head ranger, Head Bomas (4), Range officer, General works		July 2022
To train staffs–herders, rangers, general workers on pasture management skills for implementation by Sep 2022	No staff have these requisite training	Manager, Herders, Livestock Officers, Rangers	manager (source the trainer) live-stock officer- (coordinate the trainer and the staff) Rangers & herders (to be trained)	Sep 22
To train staffs–herders, rangers, general workers on herd management skills for implementation by Sep 2022	No staff have these requisite training	Manager, Herders, Livestock Officers, Rangers	Manager (source the trainer) live-stock officer- (coordinate the trainer and the staff) Rangers & herders (to be trained)	Sep 22
To formulate a supplementary budget that prioritizes pasture husbandry practices by Sep 2022	No supplementary budget is available	Board, Manager, Accountant	Board- (approval of the supplementary budget) Manager (reviews the supplementary budget) Accountant- (prepares the supplementary budget in consultation with the livestock officer)	Sep 22

OBJECTIVE	BASELINE INFORMATION	PERSON RESPONSIBLE	SPECIFIC ROLES	TIMELINE
<p>To increase water harvesting and storage infrastructure through expansion of 4 existing water pans, 10 water troughs, 1 earth dam along Mwatate river, 1 borehole, and 1 rubber tank 50,000 m³; 4 water troughs annually</p>	<p>The conservancy has 8 water pans, 3 boreholes, and 4 water troughs. Out of the 8 water pans 3 are already desilted and have plans to undertake the desiltation of more water pans and construction of more water troughs and boreholes</p>	<p>Board, Manager</p>	<p>Board- (approval of finances and deciding on the feasibility reports) Manager conducts & coordinates the feasibility study as well as the consultants that offer such services</p>	<p>Annually</p>
<p>To develop and implement a grazing plan by Oct 2022</p>	<p>The conservancy currently has no grazing plan document, however, has an undocumented procedure for grazing the livestock</p>	<p>TTWCA, Manager, and Team</p>	<p>TTWCA- (lead consultants in the preparation of the plan) Management team (mobilization of the resources to achieve full implementation of the plan.)</p>	<p>Oct 22</p>
<p>To improve on the boundary demarcations- approximately 77 km between the ranch and the community -Izera- Teri B; Mgeno grazers- Landi; Along river Mwatate- Mgeno- Choke; Mgeno – Maungu boundary- by March 2024</p>	<p>The conservancy boundaries are not clear except for the zongwani -Mgeno boundaries</p>	<p>Board, Manager External experts</p>	<p>The board's role is budgetary approval to enable infrastructure development Manager's role is to coordinate the contractors for quick implementation of the project as prescribed in the work agreement</p>	<p>Mar-24</p>

OBJECTIVE	BASELINE INFORMATION	PERSON RESPONSIBLE	SPECIFIC ROLES	TIMELINE
<p>Increase livestock production through hay harvesting and identifying areas for fattening continuously</p>	<p>the ranch currently has 2700 stocks with no hay harvesting program</p>	<p>Livestock Officers, Rangers, General Works</p>	<p>Livestock officers ensure proper nutrition of the livestock and hay harvesting, rangers assess pasture distribution and utilization levels, and general works are involved in actual hay harvesting.</p>	<p>Continuously</p>
<p>To reduce the cost of production by 20% through increasing units (economies of scale) by December 2025.</p>	<p>The ranch suffers from the high cost of production attached to feeding and pasture scarcity</p>	<p>Board, Manager, Accountant, Livestock Officers, Herders</p>	<p>Board- approves budget for mechanization and training on production. The manager ensures enabling environment and measures to track performance the accountant transparently manages the finances making savings where necessary, the livestock officer capitalizes on economies on vet expenditure. Herders ensure sustainable and maximized utilization of the pasture resources</p>	<p>Dec-25</p>

OBJECTIVE	BASELINE INFORMATION	PERSON RESPONSIBLE	SPECIFIC ROLES	TIMELINE
<p>Reduced cases of livestock diseases by 30% through intensified disease surveillance, vaccinations and treatments by March 2025</p>	<p>reduced production is attached to diseases. The ranch suffers the loss of up to 7% mortality from diseases</p>	<p>Livestock Officers, Herders, Rangers,</p>	<p>livestock officer conduct diseases surveillance and responds to clinical cases. Herder reports cases of infection, Rangers control illegal access to other livestock to limit cases of disease transfer</p>	<p>Mar-25</p>

Special appreciation to all the stakeholders participating
heads in making this possible





Grazing management Plan

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