

Conservation in the Face of Climate Change and Poaching: Leveraging Technology for Sustainability.

County:	Narok County		
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Introduction

According to the 2019 census, Narok County, in southwestern Kenya spanning 17,921 square kilometers, has a population of 1,157,873 and is predominantly inhabited by the Maasai community. Home to the renowned Maasai Mara National Reserve, Narok County relies heavily on tourism as a vital pillar of its economy. The reserve attracts thousands of visitors each year, contributing significantly to the County's economic development and providing 70% of employment opportunities for residents.

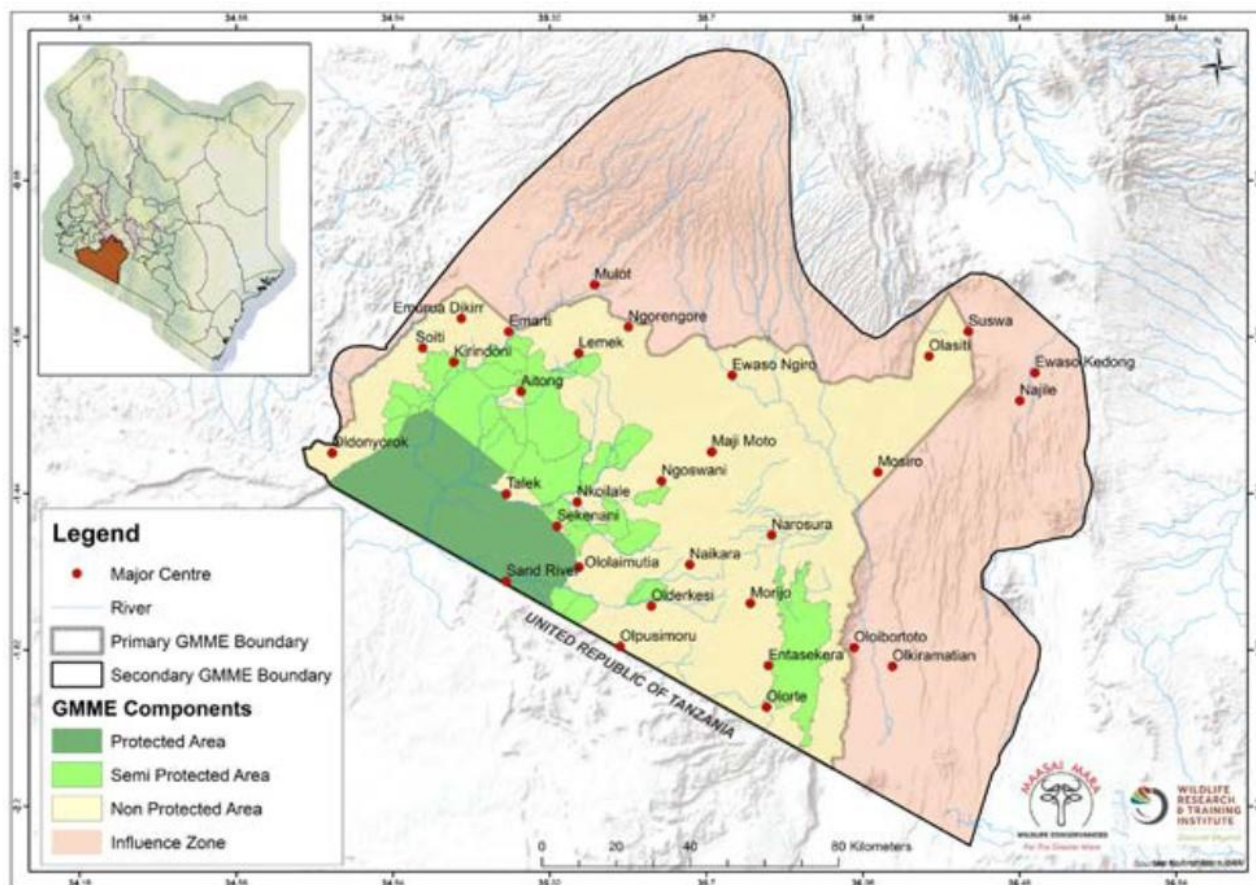
The Greater Maasai Mara Ecosystem (GMME) is a part of the extensive Serengeti-Maasai Mara Ecosystem, which spans approximately 25,000 square kilometers and is globally famous for the spectacular annual migration of over one million wildebeest. The GMME can be categorized into three main geographical components based on land use and tenure. These include the protected lands of the Maasai Mara National Reserve, semi-protected areas comprising Mara conservancies and the Loita forest and non-protected regions alongside an influence zone. While the County government of



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Narok manages the national reserve, semi-protected areas are overseen by group wildlife conservancies, balancing wildlife protection with regulated livestock grazing. Non-protected lands encompass a blend of rangeland, crop agriculture and individual settlements.



GMME Geographic map

The GMME encompasses 24 conservancies. According to GMME Management Plan 2023-2032, the County Government of Narok allocates 19% of the revenue generated from the Maasai Mara National Reserve to invest in community development and social projects within GMME. These projects include the construction of schools and health facilities, designed to enhance the infrastructure of the area. Residents of Talek have experienced significant enhancements in their community infrastructure through the establishment of essential facilities, including the Talek Maternal Newborn & Child Health Centre and the Talek Boys Secondary School.



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Despite the benefits the National Reserve provides to the country and neighboring communities, it has faced numerous challenges over the years. Poaching remains a significant issue, particularly in the southern side of Mara, where poachers from Tanzania primarily hunt for bushmeat. Additionally, there is a concerning decline in wildlife species due to natural causes, including climate change and evolutionary factors. The reserve has also encountered significant challenges with vehicle congestion, especially during the peak period of the wildebeest migration.

To mitigate these issues, the National Reserve has implemented a zoning strategy, designating and marking areas as high-use and low-use zones. This approach aims to distribute tourist activity more evenly throughout the reserve, encouraging visitors to explore less crowded, low-use areas and thereby reducing the pressure on high-use zones.



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High use Zone sign

Climate change has had a distinct impact on biodiversity, contributing to prolonged droughts, bushfires, floods all contributing to the death of wildlife. These environmental stresses have also driven humans to encroach on wildlife habitats in search of better grazing lands and refuge from degraded areas. Consequently, there has been an increase in wildlife hunting and poaching for meat.

Although Kenya Wildlife Services is in the process of developing a wildlife climate change strategy, the Maasai Mara has already taken proactive measures by not only identifying and marking high-use zones but also integrating advanced technology. In collaboration with the Footprint Foundation, the Mara has constructed a state-of-the-art technology command center to house various technological tools, including EarthRanger, which is currently utilized for multiple purposes, such as tracking endangered animals.



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One notable success story involves the rhino population, which has grown from 18 in 1983 to 80 in 2024. While this increase can be attributed to various factors, the use of EarthRanger to monitor rhinos has played a crucial role. This technology allows for the precise tracking of each animal, enabling the identification of injured rhinos that require rescue and treatment.



Black rhino in Maasai Mara



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Further, the technology command center will significantly improve the reserve's capability to address and alleviate other pressing challenges, including poaching and human-wildlife conflicts that have intensified due to climate change. By deploying advanced surveillance and monitoring systems, the centre aims to enhance incident response times and improve the overall management of the reserve.



Maasai Mara Technology Command Centre

One of the critical functions of the command centre is the ability to monitor and control high-speed vehicles within the park, reducing the risk of accidents and ensuring the safety of both wildlife and visitors. Additionally, the center tracks instances of animal harassment caused by overcrowded tourist vehicles, helping to regulate traffic and minimize disturbances to wildlife. Noise pollution, a growing concern for animal stress and habitat disruption, is also closely monitored and controlled through these technological tools. To enhance park accessibility and alleviate overuse of the high-use zones, the county has developed and improved 273 kilometers of roads. The county has also operationalized seven solar-powered boreholes.



Before and After pictures of roads in Maasai Mara

Implementation of the practice

- The Maasai Mara National Reserve was first established in 1948 when the Mara Triangle, a 520-square-kilometer area between the Siria Escarpment, the Tanzanian border and the Mara River was declared a National Game Reserve.
- In 1961, control of the reserve was transferred to the County Council of Narok and the core area was extended eastward to encompass 1,831 square kilometers.
- In 1984, sections of the reserve were excised providing watering points for livestock and reducing the reserve to its current size of 1,530 square kilometers.
- In 1995, following the creation of the Trans Mara District, management of the reserve was split between the Councils of Narok and Trans Mara, with the Council of Narok managing the area east of the Mara River and that of Trans Mara managing the Mara Triangle to the west.
- In 2001, day-to-day management of the Mara Triangle was contracted to an independent non-profit protected area management company, the Mara Conservancy, under an initial five-year agreement, which has since been extended.
- In 2013, as part of Kenya's devolved system of governance arising from the new constitution, the two county councils formed part of Narok County, which is now responsible for managing the entire reserve.
- In 2022, the County Government of Narok hosted an investors meeting at Sarova Mara, bringing together the community, various wildlife stakeholders including KWS, State Agencies, and community members.



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- During this stakeholders meeting, participants expedited the development and publication of the Maasai Mara National Reserve Management Plan 2023-2032.
- In 2023, the County developed the Greater Maasai Mara Ecosystem Management Plan, 2023-2032. The One Brand Mara marketing strategy 2023-2027 was developed the same year.
- From November 2023 to January 2024, the County, in partnership with the Footprint Foundation, conducted a series of training sessions on incorporating EarthRanger technology to monitor endangered animal populations.
- Although the areas around the Mara Triangle previously used the SMART app, the addition of EarthRanger complements and enhances these efforts by providing more comprehensive monitoring capabilities.
- The construction of the command center, intended to centralize all technological aspects, commenced in February 2024 within the Maasai Mara National Reserve.
- Embracing both SMART App and EarthRanger has reduced poaching activities in Maasai mara as indicated by the table below.

	2018		2019		2020		2021		2022		2023		TOTALS	
MONTH	ARREST	SNARES	ARREST	SNARES	ARREST	SNARES	ARREST	SNARES	ARREST	SNARES	ARREST	SNARES	ARREST	SNARES
JAN	6	0	18	0	10	0	1	0	19	476	9	6	314	1232
FEB	17	0	15	0	7	14	0	0	11	14	22	85	280	694
MAR	7	15	17	0	1	0	22	13	7	0	8	111	283	759
APR	19	4	4	0	5	0	7	0	6	4	9	0	258	692
MAY	8	0	14	13	5	0	0	14	13	0	0	0	217	297
JUN	30	71	9	7	12	19	2	92	1	0	21	0	318	1608
JUL	17	45	23	51	30	278	19	850	24	37	26	98	533	9376
AUG	41	114	14	1199	24	1241	39	708	13	721	49	907	634	22445
SEP	65	599	67	550	12	991	24	762	31	169	22	660	565	14513
OCT	45	640	8	283	12	557	6	274	59	174	14	65	1007	11418
NOV	28	744	8	175	10	90	16	475	38	236	16	53	424	4603
DEC	34	355	2	0	6	0	8	417	24	171	9	0	250	740
G/TOTA	317	2587	199	2278	134	3190	144	3605	246	2002	205	1985	5083	68377

Results of the practice

- By effectively restricting and clearly marking high-use zones, the County has successfully mitigated land degradation. This strategic approach not only preserves the natural environment but also promotes sustainable land use practices, ensuring that the area's ecological integrity is maintained for future usage.



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- With 70% of job opportunities in the Maasai Mara sourced locally from Narok County, local employment has been facilitated, significantly enhancing livelihoods within the community.
- The allocation of a percentage of revenue collected from the Maasai Mara towards community development has led to substantial improvements in local infrastructure and facilities, benefiting the residents.
- The implementation of advanced monitoring systems has significantly enhanced the tracking and protection of endangered animal populations.

Lessons learnt:

- Hiring 70% of locals in the GMME fosters a sense of community ownership and appreciation for the reserve and its conservancies.
- Engaging local communities in conservation efforts through employment and development projects fosters a sense of ownership and responsibility towards preserving natural resources and wildlife.
- By restricting access to high-use zones and clearly marking them for tourist guidance, the County ensures the prevention of land degradation and minimization of animal stress. This approach helps preserve the natural environment while providing a framework for sustainable tourism activities.
- The integration of technologies like EarthRanger demonstrates the profound impact that innovative tools and technology can have on conservation practices, from tracking endangered species to managing human-wildlife conflicts.
- Investing in local infrastructure and community projects not only supports conservation goals but also promotes sustainable development, benefiting both the environment and local populations.

Conclusion

- In conclusion, the integration of technology in conservation efforts offers a powerful tool in the fight against climate change and the preservation of biodiversity. By enabling precise tracking of endangered species and effective management of human-wildlife conflicts, technology has enhanced the ability of Maasai Mara to protect wildlife and respond to environmental challenges. This, combined with community-centric approaches such as hiring residents and investing in social projects creates a comprehensive strategy for sustainable development.