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The IUCN's Contribution to Supporting Nature Conservation Programs in Serengeti National Park

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ABSTRACT

Serengeti National Park, considered one of the most famous and significant wildlife reserves globally, where natural beauty and unparalleled scientific value converge, is experiencing a decline in habitat quality year after year. Despite the natural wealth within the Serengeti, various issues threaten wildlife species and habitats. These problems include the rapid growth of the human population, poverty, illegal hunting, and the drying up of the Mara River due to climate change. The international community has authorized the International Union for Conservation of Nature (IUCN) to develop ideas for conservation efforts. The organization illustrates how biodiversity is fundamental in addressing some of the world's most significant challenges, such as tackling climate change, achieving sustainable energy, improving human well-being, and building a green economy. The study aims to narrate the IUCN's role in executing environmental protection processes, intending to ensure that environmental goals hold the same importance as social goals through sustainable development. This study employs a qualitative approach, utilizing provided facts to create a detailed account of an incident. Additionally, secondary data is incorporated, involving the use of existing information. The results indicate that, despite various actions taken by the IUCN, the organization has not maximally resolved issues in the Serengeti, and several problems are still ongoing.

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1. Introduction

The issue of nature conservation has been a cornerstone of scientific and policy discussions in recent years. Previous research has been instrumental in understanding the role that various stakeholders, including non-governmental organizations (NGOs), play in this complex arena. International commitments and environmental policies have long been established to serve as frameworks for nature conservation (Di Gregorio et al., 2020; KimDung et al., 2016; Koch et al., 2021). These frameworks are diversified across various sectors, including human rights (Ginanjar, 2020), environmental protection (Putri, 2019), and even in the context of corporate governance (Zhao, 2016). However, the literature appears sparse when assessing the role of specialized environmental organizations like the International Union for Conservation of Nature (IUCN) in localized ecosystems such as Serengeti National Park.

Born out of an international collaborative spirit in 1948, IUCN is the world's oldest ecological organization. Through its various nomenclature changes and decades of operation, its mission has remained fundamentally consistent: to influence, encourage, and assist communities globally in conserving nature and ensuring sustainable use of natural resources. It is an organization with a prestigious track record, having achieved observer status at the United Nations and influencing environmental policies on a global scale.

Situated in Tanzania, Serengeti National Park is one of the world's most famous wildlife sanctuaries and has been studied extensively for its biodiversity (Nkwabi et al., 2018; Sinclair, 2012). Yet, it's an ecosystem under threat, grappling with challenges such as illegal hunting (Kideghesho et al., 2006), habitat degradation, and even shifts in water levels of essential rivers like the Mara (Bergesen et al., 2018; Kideghesho et al., 2006). It's a dynamic, delicate system representing broader challenges of many natural habitats.

The need for effective conservation methods is pressing, and that's where IUCN's involvement comes into play. The organization's activities range from scientific research to policy advocacy, and its efforts have a far-reaching impact on natural ecosystems globally. For instance, the IUCN has provided crucial scientific information and advice concerning global conservation policies through various international forums. In the case of Serengeti National Park, IUCN's contributions extend from policy advocacy to ground-level action plans aimed at protecting the natural ecosystem and balancing the needs of local communities.

In elaborating on this central focus, the study explores multiple dimensions. First, it delves into the historical relationship between the IUCN and Serengeti National Park. It dissects how the former's policies and recommendations have evolved since the Serengeti's designation as a priority ecosystem. This historical assessment sets the stage for understanding the dynamics of influence, compliance, and potential friction between an international organization and national-level policies and regulations. The study also intends to provide a substantive contribution to the existing literature. The study aims to fill a research gap concerning the interactions and tensions between international organizations and local or national conservation efforts. Despite the burgeoning body of work examining conservation policies and their outcomes, there remains a marked scarcity of scholarship specifically focused on the positive and negative impacts of international bodies like the IUCN on localized ecosystems. This research aims to rectify that imbalance by presenting empirical data and analytic insights that

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would augment our comprehension of how global and local conservation agendas intersect, influence, and sometimes counteract each other.

Furthermore, the analysis goes beyond mere policy review. It also ventures into the operational sphere by evaluating IUCN's on-the-ground activities in the Serengeti, such as habitat restoration, anti-poaching campaigns, and community engagement initiatives. This operational dimension is critical for understanding the theoretical and practical implications of IUCN's involvement in the Serengeti ecosystem. It also considers the social dimensions, examining how the IUCN's activities align or conflict with the needs, traditions, and aspirations of the communities living in and around the Serengeti. In summary, the paper endeavors to enhance our intellectual and practical understanding of the intricate interplay between large-scale, international conservation organizations like the IUCN and local ecosystems of global significance. By bringing the lens of critical analysis to bear on this complex relationship, the study aims to offer actionable recommendations to facilitate future synergistic, effective, and socially equitable conservation efforts.

2. Literature Review

2.1. Sustainable Development

The Brundtland Commission defines sustainable development as one that satisfies current needs without jeopardizing the ability of future generations to satiate their own. Sustainable development is not just about solving environmental problems. The goals of sustainable development are further supported by the interrelated and mutually supporting pillars of economic, social, and environmental development (United Nations, 2008). The researcher does, however, concentrate on environmental preservation and social development. There is a strong bond between these two pillars. The idea of sustainable development raises public awareness of the significance and role of environmental factors, as well as the environmental objectives and resources made available by the environment. (Dogaru, 2013).

2.2. Social Development

An ecosystem that provides significant values to our everyday lives is the structure of our physical world. The community's actual efforts to preserve the local ecosystem—such as through resource conservation, cleanliness, and wildlife preservation—are what is meant to be contributed. It is Mukherji who has expanded the similar egalitarian theory of social development. He recognized them and categorized them into three groups: Oppression, Exploitation, and Discrimination (DEO). According to Mukherji, social development is a method of gradually lowering DEO. A sense of brotherhood can be linked to social development. Society is more than just a group of people; it is a representation of people's desire to meet their basic needs (Sharma, 2019).

Through collaboration between international organizations in conducting socialization in the Serengeti area, where there is still a lack of public awareness in maintaining the surrounding ecosystem, which has a negative impact on wild animals, social development plays a role in solving problems that arise in nature conservation in the Serengeti. The community's perspective on what needs to be done to preserve the conservation of the Serengeti environment can be altered by social development.

2.3. Environmental Protection

The 1992 Rio Declaration reaffirmed the desire of the international community to protect the environment and promote the sustainable growth of the global economy on a global scale.

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Comparably, the significance of environmental conservation was emphasized in the 1986 Brundtland Commission Report (Dogaru, 2013). Environmental protection is a problem without a single policy; instead, it calls for greater efficiency across all spheres of society, including the social and economic ones, combined with the opportunities already in place. This helps to resolve issues with distribution and resources. International cooperation and regulation on a global or cross-border scale are focused on environmental protection.

According to the justification given above, environmental protection is crucial for carrying out international policies that are declared, provided for, or acknowledged at the general or conventional level of international law. At the community pit process level, sustainable development should be taken into account when determining how to proceed and how urgent it is to keep track of objectives in the long and short term for each of the five environmental impact domains (Dogaru, 2013).

This study outlines the methods used by IUCN to implement environmental protection procedures that guarantee that social and environmental goals are given equal weight. The way the environment is managed has a big impact on how good the environment is. It is crucial to increase environmental protection and practice wise management as a result. Both the community and the government bear responsibility for the preservation and sustainable management of the environment. The operation of public services to safeguard and maintain the environment involves the government. This is to guarantee a pleasant and healthful living environment for every resident.

According to this study, IUCN will promote social development initiatives aimed at educating the public about the harm that tourism can do to the Serengeti's ecosystems, including the possibility of extinction. These initiatives will be supported by the concept of sustainable development. The fact that the ecosystem within our planet is essential must also be understood by society. Later on, humans will benefit greatly from this ecosystem in their daily lives. Therefore, in order to avoid unfavorable outcomes, we need laws that govern relationships and promote legal awareness in interpersonal interactions.

3. Research Methodology

In the realm of research, many data collection methods exist, each offering a unique set of advantages and limitations. To navigate this complex landscape, a researcher must understand the methodological tools. With this in mind, the current study adopts a methodological approach rooted in qualitative and library-based research (Goodman, 2011). This combination aims to produce comprehensive, nuanced insights into the International Union for Conservation of Nature (IUCN) 's role in enhancing Serengeti National Park conservation efforts. To emphasize the application process, the research design was meticulously planned to ensure that the data gathered would answer the research questions as accurately and robustly as possible. The data were collected from various secondary sources, such as academic journals, newspapers, public libraries, and organizational reports. Each source was evaluated for credibility, relevance, and academic rigor before incorporation into the dataset.

According to Mulyadi, case study research possesses several distinct characteristics (Mulyadi, 2013). Firstly, it hones in on a specific event or occurrence that stands apart from broader social phenomena, offering insight into its unique dynamics. Secondly, case study writing provides rich contextual backgrounds, further emphasizing the distinctiveness of the case at hand. In this study, the "case" under examination is the role and contributions of the IUCN in tackling challenges in Serengeti National Park, making the case study methodology an apt choice.

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A secondary data analysis technique informs the qualitative aspect of this research. Here, existing data are not merely summarized but undergo a rigorous analytical process. The goal is to construct a multi-faceted understanding of the phenomena under study—namely, the effectiveness of IUCN's contributions to the conservation efforts in Serengeti National Park. The analytical framework is designed to tease out nuances, explore complexities, and shed light on the underlying mechanisms through which the IUCN's policies and activities impact the park's ecological and social fabric. The primary objective of adopting this hybrid qualitative-library research approach is to develop a holistic understanding of the IUCN's interventions. It aims to provide descriptive and interpretive accounts of how the IUCN's policies, practices, and strategies have been received, implemented, and assessed within the Serengeti ecosystem. By applying this methodological approach, the research hopes to fill an existing gap in the literature. It seeks to elucidate the intricate interplay between international organizations like the IUCN and localized conservation efforts, thereby contributing to the broader discourse on effective, sustainable environmental stewardship.

4. Results and Discussion

4.1. The Conservation Crisis in Serengeti

About 2 million creatures migrate every year across the environment of the Serengeti, mainly wildebeests, zebras, and other species of the plains. The Serengeti National Park, the Kenya Masai Mara National Reserve, and wildlife management areas also encompass the area. The Serengeti National Park was established in 1940, marking a milestone in the conservation of wildlife species and habitats in Tanzania (Kideghesho, 2010). The Serengeti is considered suitable as a national park because its insignificant mineral deposits, the tsetse fly, and a lack of rainfall make the Serengeti soil type unattractive to European miners and farmers. The Serengeti is a multi-ethnic area with 30 tribes, each with a unique identity and history.

Although the Serengeti is the world's leading conservation area due to its cultural diversity and abundant wildlife species, it faces several environmental and social development problems. The factors contributing to these problems include the destruction of wildlife habitat due to the rapid growth of the human population, poverty, illegal hunting, and the drying up of the Mara River due to the impact of globalization. Most of these issues have potential negative impacts on wildlife species and habitats.

4.1.1. Illegal Hunting

Poaching is a significant off-farm activity for rural communities residing around the Serengeti ecosystem. Hunting is particularly prevalent in the western part of the ecosystem, presenting a longstanding management challenge for conservation authorities due to economic and cultural factors. Historically, illegal hunting has been viewed as a primary coping and adaptive strategy in response to poverty and rapid human population growth's escalating demand for resources (Kideghesho, 2010). According to estimates based on 1978 and 1988 national census data (Loibooki et al., 2002), the number of poachers within 45 km of National Park boundaries and associated protected areas was 23,294 and 31,655, respectively. These activities fulfilled household and commercial consumption needs (Holmern et al., 2002). Mentions that about 61% of poachers aim for personal consumption, 8.5% for cash, and 31% for both purposes.

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4.1.2. Habitat Destruction

The long-term survival and ecological integrity significantly impact the quality of wildlife habitat. Basic factors such as human population growth and poverty contribute to wildlife loss. Rapid population growth can escalate the demand for land (for cultivation purposes, livestock grazing, and settlements), fuelwood, building poles, and medicinal plants. Meanwhile, poverty can compromise habitat quality by limiting access to technology and modern agriculture, making expansion into new land the most feasible strategy for increasing agricultural yields. Additionally, the extensive use of firewood, depleting wildlife habitat, is common among people experiencing poverty due to the lack of alternative energy sources, such as environmentally and economically friendly electricity (Kideghesho et al., 2006).

4.1.3. Demographic Factors

In the last four decades, the area bordering the Serengeti National Park has witnessed high population growth. The highest rate of increase, at 10% per year, was observed over ten years between 1957 and 1967. In the seven districts west of the national park, the human population exceeded two million, with an annual growth rate surpassing the national average of 2.9% (Schmidt et al., 2015).

The Maswa Wildlife Sanctuary is also experiencing a rise in the human population near the protected area west of the Serengeti. The community advocates for the government to rearrange the nature reserve's boundaries, reducing the original area by 15% (Kilungu et al., 2014; Salazar, 2010). Expanding arable land and settlements in the Serengeti has led to decreased livestock land, which continues to increase alongside the growing human population. Statistics from the Serengeti District indicate a 52% increase in livestock units from 175,680.5 in 1990 to 266,624.5 in 2002. This has resulted in the demand for land for livestock, which has increased from 2,108.1 to 3,199.5 km^2, surpassing the lower carrying capacity already exceeded a decade earlier (Kauzeni & Kiwasila, 1994).

Table 1. Available and Required Land* for Livestock Grazing in Serengeti and Bunda Districts in 2002

District	Livestock Units 2002	Land Available (Km^2)	Land Requirement (Km^2)	% of Land Exceeded
Serengeti	266,624	2,456	3,199	30
Bunda	267,090	2,408	3,205	33

* The land requirement is calculated based on livestock units (LU), with 1 LU equivalent to 1 cow/bull, two goats or sheep, or five donkeys, requiring 1.2 ha.

Source: (Kideghesho, 2010)

Livestock in narrow areas can contribute to issues such as overgrazing, soil erosion, and silting of water bodies (Kideghesho et al., 2005). Insufficient pasture, as indicated in Table 1, and poor soil quality may prompt livestock owners to press the Tanzanian government for actions such as revoking protected area status or permitting legal access to crucial grazing land and water points in Grumeti, Ikorongo, and Kijereshi Game Reserves (Kideghesho et al., 2005). Nevertheless, villagers in this area persist in illegally utilizing resources within the protected area to survive.

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4.1.4. Poverty

In rural Tanzania, where poverty is predominant, livelihoods rely heavily on the agricultural and livestock sectors. The annual gross income from this sector is very low, exacerbated by several environmental problems such as land scarcity, drought, disease, pests, poor soil fertility, and the lack of agricultural inputs (Johannesen, 2003; Kauzeni, 1995).

Poverty and ecological problems in the Serengeti are closely correlated and extensively discussed. The limited sources of livelihood for local communities serve as triggers for hunting wild animal species and encroachment on their habitat, including foraging for food, breeding grounds, oil and gas corridors, and distribution areas (Campbell et al., 2001). Illegal hunting in this area is motivated by the need for food, increased household budgets, and payment of government levies and other fees (Johannesen, 2003). Due to the economic unaffordability of modern technology and agricultural inputs for local communities, yields are increased by clearing new agricultural land in critical and sensitive wildlife areas (Kideghesho, 2010).

4.1.5. Water Supply Reduction

The Mara, the sole permanent river in the Serengeti, provides migratory animals water during the dry season. Originating from the confluence of the Amala and Nyangores Rivers in the highlands of Kenya, the Mara River is a cross-border watercourse that flows upstream through Kenya and downstream into Tanzania.

The International Union for Conservation of Nature (IUCN) recommends that the Committee of the East African Community take note of and monitor the changes in the Serengeti-Mara ecosystem. According to the IUCN, the ecosystem has undergone significant transformations recently. Notably, there has been substantial settlement and intense large-scale agricultural growth along much of the Kenyan bank of the Mara River, leading to exponential expansion of off-take for irrigation and water supplies. Except for a small part inside the Serengeti, the river is exploited almost entirely.

Tourism activities' expansion within the Masai Mara National Reserve and nearby wildlife habitats has impacted garbage production and disposal. Forest land has decreased, affecting the soil's water retention capacity. Consequently, increased rainfall causes floods, undermining the riverbanks. Paradoxically, less water remains in the soil during the dry season, resulting in a gradual decrease in flow, causing the Mara to be lower in the dry season.

Modeling studies estimate that even if wild beasts do not drink from the river (their sole water source throughout the dry season), 80% of them will be killed, leaving the habitat seriously degraded (Hoffman et al., 2011). To sustain the Serengeti ecosystem, Tanzania must actively participate in decision-making processes related to the Mara and Ewaso Ngiro rivers alongside Kenya and consider suspending dam funding, if feasible.

The water-supply equation must incorporate potential climate change, land use, and land cover changes (Konapala et al., 2020). However, it's crucial to note that population growth and the influence of land use/coverage are also key drivers of climate change and uncertainty (Di Marco et al., 2019; Ordonez et al., 2014). Within the Mara River Basin (MRB), there has been a considerable and alarming rate of change in land use/land cover in recent research. Rangelands (savannas, grasslands, and shrublands) decreased by 53%, while forest cover decreased by 32% between 1973 and 2000. Additionally, agricultural land more than doubled during the same period (Mati et al., 2008).

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Table 2. Monthly Water Consumption Breakdown for Different Sectors and Total Annual Water Usage (m^3)

Month	Human Population	Livestock (Mean Requirements)	Wildlife	Lodges and Tent Camps	Large-scale Irrigation	Mining	Total Consumptive Water Uses per Month (m^3)
January	409,398.4	344,360.4	54,392.9	12,463.2	1,297,200	0[a]	2,117,814.9
February	396,779.2	311,035.2	49,129.1	13,065.9	1,007,400	15,064	1,765,473.4
March	409,398.4	344,360.4	54,392.9	11,721.1	696,900	5,208	1,521,980.8
April	396,192.0	333,252.0	52,638.3	10,499.4	621,000	0[a]	1,413,581.7
May	409,398.4	344,360.4	54,392.9	8,104.6	910,800	0[a]	1,727,056.3
June	396,192.0	333,252.0	52,638.3	12,061.2	1,400,700	52,830	2,247,673.5
July	409,398.4	344,360.4	355,894.0[b]	16,456.7	1,407,600	180,017	2,713,726.5
August	409,398.4	344,360.4	355,894.0[b]	19,201.4	1,262,700	136,121	2,527,675.2
September	396,192.0	333,252.0	344,413.5[b]	13,873.8	1,214,400	0[a]	2,302,131.3
October	409,398.4	344,360.4	355,894.0[b]	13,711.9	1,373,100	110,794	2,607,258.7
November	396,192.0	333,252.0	52,638.3	10,248.6	614,100	124,680	1,531,110.9
December	409,398.4	344,360.4	54,392.9	11,226.3	517,500	93[a]	1,336,971.0
Annual	4,820,336.0	4,054,566.0	1,836,711.1	152,634.1	12,323,400	624,807	23,812,454.2

[a] Irrigation was not feasible in September and was restricted in December due to inadequate rainfall. It was unnecessary in January, April, and May owing to abundant rainfall (North Mara Mine, 2006).
[b] Implies that the yearly migration is well within the Mara River Basin (MRB) for the four months from July through October (Gereta et al., 2002).

The challenges facing the Serengeti are significant, given its role as the heart of a vast wildlife migration ecosystem. Designated by UNESCO as a world heritage site, the Serengeti plays a crucial role in Tanzania's tourism industry and serves as a laboratory for ecosystem life. It boasts its original habitat abundant biodiversity, and is a critical ecosystem in South Africa. Most of the Serengeti National Park population consists of indigenous people who have depended on the area for their livelihoods for thousands of years.

Various international organizations have intervened to address the issues in the Serengeti, each with its focus. The Serengeti holds UNESCO World Heritage Site status, recognized for its Outstanding Universal Value. The World Heritage Committee, comprised of representatives from 21 of the 189 countries that have signed The World Heritage Convention, oversees the site. UNESCO actively monitors the Serengeti National Park, sharing observation results on its website.

The Frankfurt Zoological Society, an international conservation organization based in Germany, collaborates with indigenous peoples to actively engage in conservation and find sustainable livelihood opportunities (Britannica, 2016). Partnering with the National Parks of Tanzania, the society works on the Serengeti Ecosystem Development and Conservation Project (SEDCP) to balance community development with conservation goals. Addressing the challenge of poaching, the society funds the de-snaring program.

Similarly, the WWF collaborates with the government to combat poaching in the Serengeti. Their initiatives include acquiring anti-poaching equipment, involving the community and the private sector in campaigns, conducting censuses, reducing human-wildlife

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conflicts, securing roaming areas, and developing databases for managing elephant and rhino populations.

The economic recession and the government's failure to fund law enforcement operations and policy-making significantly impact African countries, particularly in the underfunding of the natural resources sector. Each protected area receives minimal funds, contributing to rampant poaching due to limited income and livestock. The IUCN acts as a communicator and mediator, collaborating to address the challenges in the Serengeti. The organization encourages global efforts to preserve nature's integrity and diversity, ensuring just and ecologically sustainable use of natural resources. The IUCN receives reports from other organizations or the public regarding potential impacts on the conservation of the Serengeti National Park.

4.2. IUCN's Contribution to Conservation Sustainability in the Serengeti

4.2.1. The Significance of IUCN in Nature Conservation

The environment and ecosystem are crucial for all life, including humans, animals, and plants. Therefore, taking care of our environment is essential; humans are the most influential actors in protecting it. To achieve our conservation goals, there is a need to form an organization or community. In 1999, several organizations focused on preserving the environment and natural resources, notably the International Union for Conservation of Nature (IUCN), recognized as the world's largest environmental network. Intending to influence, inspire, and support global conservation efforts, the IUCN has over 1,400 government and non-government organization members and around 16,000 scientists and experts volunteering on IUCN commissions. Headquartered in Gland, Switzerland, the IUCN provides high-quality knowledge, information, and data for its duties.

Nature conservation and biodiversity are closely related, with conservation leading to the restoration or enhancement of biodiversity. When considering nature conservation, such as freedom from anthropogenic disturbances and environmentally friendly energy use (Birkhofer et al., 2018). The IUCN is crucial in mobilizing biodiversity expertise, promoting global conservation efforts, and collecting, synthesizing, and disseminating biodiversity data.

The IUCN, like other conservation organizations, functions in biodiversity data management, including creation, processing, and marketing. It plays various roles, such as meeting facilitation, acting as a middleman, and setting standards as a global membership organization. With a plan to strengthen its leadership in biodiversity conservation, the IUCN ensures the ethical transmission of biodiversity data and provides leadership in the conservation community by developing and applying standards and best practices.

4.2.2. IUCN Policy Advice

IUCN has received complaints from its network expressing concern that the proposed tourist development may harm the property's integrity, particularly by increasing tourism pressure, straining scarce water resources, and interfering with animal movement. Furthermore, the facility is reportedly being built on a crucial wildlife corridor, especially for wildebeest migration through the Mara Serengeti habitat. Therefore, IUCN advises the State Party to ensure that any tourist development at the property aligns with the property's management strategy and does not compromise its authenticity (UNESCO, 2006). The World Heritage Centre and IUCN also advise the State Party to ensure that incidents of elephant branching and the carcass ratio in elephant census records are transparently recorded to

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accurately detect any increases in wildlife and facilitate intervention for a clearer analysis of the offtake.

It was noted that IUCN advised the Committee of the East African Community to continue reviewing the situation, given that the Serengeti-Mara ecosystem has undergone major changes in recent years, including:

- Virtually exploiting rivers in most of their streams.
- The increasing growth of tourism facilities within the Masai Mara Nature Reserve and the adjacent wildlife area impacting the collection and disposal of waste.
- Deforestation's effect on the capacity of soil to hold water. When it rains, there will be high flooding and eroding riverbanks. On the other hand, in the dry season, less water remains in the soil, leading to lower water discharge. As a result, the Mara gets lower and lower in the dry season.

4.2.3. IUCN Collaboration

The modified general management plan was adopted under the World Heritage Centre and the IUCN (2005-2015). This plan, supported by all stakeholders, may serve as a basis for other parks in Tanzania. However, it must be fully integrated and utilized for all property planning. Additionally, as part of the overall management planning process, the UNESCO-IUCN-UNF Enhancing Our Heritage Project has assisted in developing an ecological monitoring system for the park.

On March 2, 2009, the State Party submitted a conservation assessment of the site (UNESCO, 2009). The study outlines recommended changes to the property and buffer area limits, security needs, employee and capacity requirements, visitor information, and property concerns. The World Heritage Centre and the IUCN welcome the State Party's efforts in defining and expanding the national park's boundaries. In partnership with the World Heritage Centre, they encourage the State Party to analyze and acknowledge such changes to its boundaries by requesting an extension.

The State Party also noted poaching, a drop in the Mara River flow, and unauthorized burning. However, according to the IUCN, endangered species were also observed to flourish on the land. The State Party also discussed some of its activities in the context of its "Enhancing Our Heritage" (EoH) initiative in the World Heritage Centre/IUCN/UN Foundation. The second Serengeti evaluation as part of this effort was concluded in December 2007. As part of this project, the State Party defined and tracked numerous indicators, including an evaluation of improving the forests of Acacia and the restoration of the populations of Black Rhino.

The Serengeti National Park is a major contributor to developing African protected areas. According to IUCN, the Frankfurt Zoological Society (FZS) has significantly contributed to wildlife protection (Vogel, 2019). Critical funding, financial support, logistical assistance, resource protection information, ecological and threat monitoring, and the administration of the Serengeti National Park are provided through collaboration with the Tanzania National Park. FZS also ensures the long-term protection of elephants, rhinos, and other wildlife. FZS supports Serengeti Park personnel in coordinating and improving intelligence-gathering activities to prevent and monitor wildlife crime. FZS also addresses other areas, such as community work and actively promoting live ecosystems to contribute to conservation and sustainable lives. To safeguard nature protection in Serengeti Park, the IUCN also plays a vital role in cooperating with other stakeholders.

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4.2.4. IUCN's Reconstruction of Serengeti Policymakers

The State Party provided a comprehensive assessment of the conservation status of the Serengeti National Park on February 25, 2010. Decision 33 of COM 7B.10, outlined in the Commission report, primarily addresses difficulties (IUCN, n.d.; Mwakaje et al., 2013).

1) Water Resource Management

The State Party reports substantial progress in formulating a comprehensive transboundary strategy for the Mara River. Three key papers have been produced, serving as the foundation for policy development in the following years:

a) Environmental Flow Assessment (EFA) of the Mara River, establishing maximum abstraction quantities for both Kenya and Tanzania;
b) Detailed Strategic Environmental Assessment (SEA) of the Mara River basin; and
c) Development of a Biodiversity Action Plan (BAP) for the region.

The EFA and SEA have received preliminary endorsement from the Lake Victoria Basin Commission of the East African Community.

In response to queries from the Committee on World Heritage and their evaluation at Bilila Lodge, the State Party notes that, following thorough hydrological analyses, the plan has been somewhat neglected. According to Tanzania National Parks policy, three deep wells have been excavated. The State Party believes that an environmental assessment of the ongoing use of Bologonja Springs is no longer warranted due to these recent developments. However, it seeks financial and technical assistance for water management studies within the property, citing a shortage of water resources, and will propose aid to the World Heritage Committee.

In collaboration with the Government of Kenya and the Eastern African WWF Programme, the World Heritage Site and the International Union for Conservation of Nature (IUCN) commend the efforts of State Parties to establish clear water-related rules for the Mara River. However, they emphasize the urgency of adopting water management policies in line with existing environmental flow evaluations and other critical documents. Factors contributing to the decline in Mara River flow include deforestation in Kenya, high sediment burdens from erosion, excessive water exploitation, and the anticipated climate change effect. These factors may lead to extensive droughts and, in the worst-case scenario, stop the Mara River from flowing, jeopardizing the historic migration of the Serengeti.

2) Potential Extension of the Property to Include Speke Gulf

The State Party deems it essential to add the approximately 96 km² Speke Gulf to the property, as it provides an alternative water supply for animals during the dry season. The Tanzania National Parks Council of Trustees has submitted a memorandum supporting this extension. The World Heritage Centre and IUCN are seeking assistance and fully support the proposed extension, considering it crucial for the long-term value and preservation of the site.

3) Visitor Management

While noting essential management concerns regarding tourist numbers and distribution across the land, the State Party acknowledges the difficulty in determining the actual tourist capacity of the Serengeti without a comprehensive study. To enhance its internal capability, it intends to seek external assistance from various parties, including the IUCN and the World Heritage Centre. A comprehensive evaluation of the Tourism Management Program is underway to address emerging tourism challenges and improve sustainable management. Once the amended program is accepted, it will be submitted to the World Heritage Centre. The

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World Heritage Centre and the IUCN appreciate the State Party's efforts for assistance but suggest that the amended program be introduced before ratification for adequate information. They also emphasize that proposals for additional tourism facilities should be made available to the World Heritage Centre before planning permits are issued.

4) Increasing Poaching Pressure

The IUCN concerns rhinoceros and elephant poaching in the Serengeti National Park. Additionally, evidence suggests increased wildlife wrestling for bushmeat, especially during wild animal migration. The State Party did not report this rise in poaching activity.

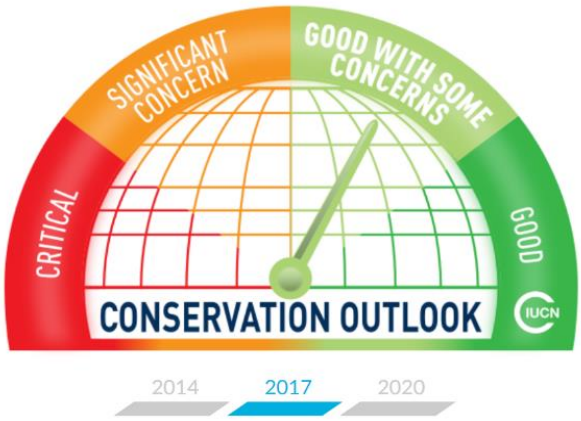

Figure 1. Conservation Outlook Chart of the Serengeti in 2017
Source: (IUCN, 2017)

Since around December 1, 2017, the State Party has provided an update on conservation efforts, covering some of the latest improvements in the Serengeti National Park. Tanzania and Kenya have recently collaborated to intensify anti-poaching efforts in the Serengeti Ecosystem. As a result, between 2014/15 and 2016/17, the number of poached elephants decreased from 16 to 8, and no rhino poaching was recorded. There was an increase in patrols and light aerial surveillance aircraft (from 845 to 1,028), along with an increase in the number of apprehended hunters (from 845 to 1,028) (WWF, 2010).

The Mara River Transboundary Water User Forum has provided a platform for discourse and paved the way for trans-frontier resource-based management efforts. The East African Community/Lake Victoria Basin Commission has also shown interest in protecting the Mara and the Mau Forest ecosystems (WWF, 2010).

According to the author's study, the role of the IUCN was significant, as the conservation status of the Serengeti National Park was reported as 'good with some concerns' in 2017 (IUCN, 2020).

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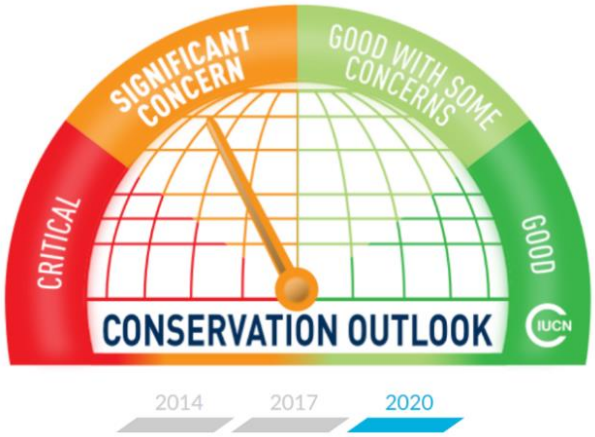

Figure 2. Conservation Outlook Chart of the Serengeti in 2020
Source: (IUCN, 2020)

However, in 2020, the Conservation Outlook Chart for the Serengeti decreased to a 'significant concern' status. This change is attributed to the rising dangers in development and management that the Serengeti faces. Climate change-induced uncertain precipitation patterns, coupled with the proposed construction of dams upstream in the Mara watershed, could alter air availability at Serengeti and potentially impact the remarkable natural phenomenon of animal migration in the Serengeti-Mara ecosystem. The increased illegal perimeter grazing and hardening of protected limits have caused a two-decade redistribution of animals in the ecosystem, making it vulnerable to contemporary challenges like climate change and disease expansion.

Additionally, in 2020, an update indicated that the incorporation of Speke Gulf into the park was a work in progress, with affected communities set to be compensated. Once the process is complete, a proposed boundary modification will align with the Operational Guidelines. The progress toward expanding the National Park into Speke Gulf is welcomed, as it creates wildlife corridors providing permanent access to Lake Victoria water, which is crucial during droughts. The Committee is recommended to ask the State Party to keep the World Heritage Center updated on this effort.

The contribution made by IUCN in addressing the environmental problems in Serengeti aligns with the concept of sustainable development used in this research. Sustainable development prioritizes development without compromising the ability of future generations. IUCN serves as a communicator, addressing community concerns and aspirations and conveying them to the State Party for policy changes. In line with the pillar of social development, where community action in maintaining ecosystems is crucial, IUCN also directs the State Party to consider tourism property development without damaging the Serengeti habitat. Environmental protection, a key pillar, receives attention from the IUCN through advice to the State Party to prevent the increase in the number of endangered species in the Serengeti.

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Table 3. IUCN Contributions to the Sustainability of Conservation

	Main Aim	Scope	Response/Impact
Policy Advice	IUCN advises the Committee of East Africa Community to continue monitoring the situation on the Serengeti, given that there have been major changes in recent years.	External	
	- IUCN advises state parties to ensure that any tourism development must be under a property management strategy not to jeopardize the authenticity of nature conservation. - IUCN advises States Parties regarding elephant branching and carcass ratios in elephant censuses to always be recorded to detect increased forest fires and facilitate offtake analysis.	Internal	The State Party submitted an update on conservation efforts. The paper covers some of the latest improvements in the Serengeti National Park.
Collaboration	- As part of the overall management planning process, the UNESCO-IUCN-UNF Enhancing Our Heritage Project has aided in developing an ecological monitoring system for the park. - In partnership with the World Heritage Centre, they encourage the State Party to analyze and acknowledge such changes on its boundaries by requesting an extension. - According to IUCN, the International Zoological Society has significantly contributed to wildlife protection (FZS).	External	
	- IUCN welcomes the State Party's efforts in defining and expanding the national park's boundaries. - The State Party also debated some of its activities in the context of its "Enhancing Our Heritage" (EoH) initiative in the World Heritage Centre/IUCN/UN Foundation.	Internal	

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	Main Aim	Scope	Response/Impact
Reconstruct the Serengeti Policymakers	- **Water Resource Management** In collaboration with the Government of Kenya and the Eastern African WWF Programm, the World Heritage Site and the International Union for Conservation of Nature (IUCN) appreciate the efforts of State Parties to establish clear water-related rules for the Mara River. However, water management policies must be adopted as quickly as practicable according to existing environmental flow evaluations and the other critical papers above.	External	
	- **Potential extension of the property to include Speke Gulf** The State Party considers it vital to add the c. 96 km² Speke Gulf to this property since it provides an alternative water supply for animals of such properties in the dry season. Then, both agencies fully support the proposed extension, which is essential for the long-lasting value and preservation of the site. - **Visitor Management** The State Party notes that there are always essential management concerns regarding tourist numbers spread around the land. Therefore, a comprehensive evaluation of the Tourism Management Program is underway to address emerging tourism challenges and improve the sustainable management of tourism. It shall be prepared for the World Heritage Centre after the amended program has been accepted. - **Increasing poaching pressure** Reportedly, the IUCN worries about rhinoceros and elephant wildlife in the Serengeti National	Internal	- The progress made towards expanding the National Park into the Speke Gulf is welcome, leading to the creation of wildlife corridors that can provide permanent access to Lake Victoria water, which can be critical in times of drought. It is recommended that the Committee ask the State Party to keep the World Heritage Center updated on this effort. - Recently, Tanzania and Kenya are joining forces to step up anti-poaching in the Serengeti Ecosystem. As a result, in 2014/15 and 2016/17, the number of elephants poached decreased from 16 to 8; no recorded poaching of rhinos increased patrol and light aerial surveillance aircraft numbers (from 845 to

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	Main Aim	Scope	Response/Impact
	Park. In addition, the IUCN has received evidence that the wild animal wrestling in bushmeat, especially wild animal migration, is increasing. The State Party did not report this increase in branching activity.		1028) and increased the number of apprehended hunters (from 845 to 1,028).

Compiled from many sources

5. Conclusion

In this study, the Serengeti, incidentally one of the largest migration sites for wildlife, is facing an increasing threat of extinction. Several environmental events are detrimental to wildlife, including illegal hunting, destruction of wildlife habitat, increased human growth, hunger, and drying of the Mara River. The Mara River is the sole water source for animal movement during dry years. However, the forest area decreases as the years pass, reducing the soil's water-holding capacity. In the dry season, less water remains in the soil, resulting in lower discharge, causing the Mara River to recede during the dry season. The writer's analysis reveals an intertwining of problems, where each issue contributes to another, ultimately leading to illegal hunting and increased wildlife extinction. Due to many problems, the IUCN classified the Serengeti as a protected area in 2001. The study's results remain unstable, reflecting differences in conservation views in the Serengeti between 2017 and 2020. 2017, the conservation view map received a 'good' status with some concerns. However, in 2020, the quality of Serengeti Park declined. The research, therefore, yields an unstable result.

Climate change is identified as one of the causes of fluctuating rainfall in the Mara River, a crucial source of habitat life in the Serengeti. Erratic rainfall impacts the Mara River's unstable water supply, affecting all Serengeti National Park habitats. Despite the IUCN's dedicated efforts to protect the Serengeti, natural events beyond human control, such as climate change, pose challenges. Social inequality can also contribute to problems like poaching, leading to the extinction of wild animals. When faced with economic challenges, local communities engage in illegal and ecologically damaging activities as survival strategies.

International Relations are not solely about politics but extend to global interactions. The IUCN, as an external actor and international organization focused on nature conservation, plays a significant role. This study underscores the profound impact of environmental damage caused by humans or nature. Solving major problems requires collaboration between organizations, state governments, and other international bodies, with the government serving a crucial role in ensuring the stability of nature conservation in the Serengeti. The IUCN, acting as an external entity, collaborates with State Parties, UNESCO, WWF, and FZS to address international issues.

The research primarily focuses on the environmental protection section, listing various aspects of preventing increased wildlife extinctions. The scope of the study is located in Serengeti nature conservation, which plays a crucial role in wildlife migration. Based on the findings, the study recommends further research to formulate and implement long-term nature conservation policies designed by the IUCN. This aims to protect wildlife from extinction that may arise from a community mindset valuing wild animals more than humans. Additionally, the government is urged to consider conservation protection and the welfare of local communities around the Serengeti. Recognizing the causality between nature conservation and

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the welfare of local communities emphasizes the need for attention to both aspects by the government and the IUCN.

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The authors have declared no potential conflicts of interest concerning this article's research, authorship, and/or publication.

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