

Geotechnologies and the Environment

Jeffrey O. Durrant · Emanuel H. Martin
Kokel Melubo · Ryan R. Jensen
Leslie A. Hadfield · Perry J. Hardin
Laurie Weisler *Editors*

Protected Areas in Northern Tanzania

Local Communities, Land Use Change,
and Management Challenges

 Springer

Geotechnologies and the Environment

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Foreword

Tanzania is home to some of our planet's most beautiful and captivating natural areas. In particular, Northern Tanzania contains majestic Mount Kilimanjaro, the Serengeti National Park, the Ngorongoro Conservation Area, and many other areas with astonishing wildlife and vegetation. These areas are critically important in supporting the country's economy through the tourism industry. For decades, the protected areas in the north have played a significant role in biodiversity conservation and have supported protected areas located in other parts of the country where tourism revenues generated are too minimal to meet the budgets required for operational and administrative costs.

In the face of increasing challenges such as rapid human population growth, poverty, climate change, and human-wildlife conflicts, these areas and the species that inhabit them are becoming increasingly threatened. Population growth is causing changes in land use and land cover, and, consequently, the natural environment is being altered through loss of habitats, destruction of breeding sites and dispersal areas, and blockage of wildlife corridors. Poverty is forcing people to violate laws governing the protected areas in order to survive. Where poverty is prevalent, wildlife crimes such as poaching and encroachment are also common. It is apparent that human-wildlife conflicts are a function of rapid human population growth, poverty, and climate change.

This book presents a significant and important contribution to understanding the protected areas in Northern Tanzania. Key human and physical characteristics in and around these protected areas include historical protective land trends, government policies and governance of protected areas, local people's attitudes towards protected lands, wildlife crime, historical changes in porter work, land cover changes in and around protected lands, conservation of large animals and cavity-nesting birds, wildlife censuses, and student preparation to manage protected lands. These and other relevant topics are elucidated in concise and efficient studies and chapters.

The book is multidisciplinary and encompasses the perspective of numerous people with diverse academic backgrounds and varying experiences. I believe that this book will be a useful conservation tool and will attract attention from a wide

range of researchers, scientists, students, policy-makers, administrators, and local stakeholders wishing to better understand various dynamics regarding protected areas in Northern Tanzania.

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Contents

1	Tanzania: A Microcosm of the World’s Changing Geography for Protected Areas	1
	Jeffrey O. Durrant and Rebecca Formica	
2	Growing Concern for the Conservation of Cavity-Nesting Birds Outside Protected Areas: Can Artificial Nest Boxes Be Effective Conservation Tools?	15
	Hamadi I. Dulle, Saleh S. Seif, Shedrack K. Mungure, and Jafari R. Kideghesho	
3	Historical Change in Porter Work on Kilimanjaro	29
	Leslie A. Hadfield	
4	Attitudes of the Local Community Toward Giraffe in Arusha National Park, Tanzania	45
	Obeid Mahenya and Naomi Chacha	
5	Preparing Students for Protected Areas Through Solo and Plain Expedition on the Roof of Africa	59
	Kokel Melubo, Elizabeth Kamili, and Rehema A. Shoo	
6	Ecotourism Potential and Challenges at Lake Natron Ramsar Site, Tanzania	75
	Rehema Abeli Shoo	
7	Poachers’ Strategies to Surmount Anti-poaching Efforts in Western Serengeti, Tanzania.	91
	Alfan A. Rija and Jafari R. Kideghesho	
8	Community Governance of Wildlife Resources: Implications for Conservation, Livelihood, and Improvement in Democratic Space	113
	Alex W. Kisingo and Jafari R. Kideghesho	

9 Land Cover and Landscape Changes in the Kwakuchinja Wildlife Corridor Adjacent to Road A-104, 2002 to 2017 121
Emanuel H. Martin, Perry J. Hardin, Ryan R. Jensen, Rehema A. Shoo, and Alex W. Kisingo

10 Dry Season Wildlife Census in Mkomazi National Park, 2015. 133
Gideon A. Mseja, Alex W. Kisingo, Emanuel Stephan, and Emanuel H. Martin

11 Using MODIS Yearly Land Cover Data to Study Vegetation Changes in Mkomazi National Park 2001 to 2013 145
Emanuel H. Martin, Ryan R. Jensen, Perry J. Hardin, Glory Sumaye, Abel Mtui, Rehema A. Shoo, and Emanuel Stephan

12 Conservation of Large Mammals in the Face of Increasing Human Population and Urbanization in Tanzania 157
Jafari R. Kideghesho, Gideon A. Mseja, Oliver C. Nyakunga, and Hamad I. Dulle

Chapter 1

Tanzania: A Microcosm of the World's Changing Geography for Protected Areas



Jeffrey O. Durrant and Rebecca Formica

Abstract On October 6, 1889, Yohani Kinyala Lauwo guided Hans Meyer to the summit of Mount Kilimanjaro. “Lauwo,” as he is often referred to, was only a teenager when he was chosen by local Chagga leaders to guide the European expedition on the first known ascent to the highest point in Africa. One hundred years after this first ascent of the legendary mountain, Lauwo was able to attend the centennial celebration of the climb, as he lived until May of 1996. The 107 years between the first known ascent of Kilimanjaro and the death of Lauwo brought massive changes to the area around the mountain and the country of Tanzania. And the subsequent decades have only hastened these changes and the broader geography that surrounds protected areas such as Mount Kilimanjaro.

Keywords National parks · Protected areas · Kilimanjaro

On October 6, 1889, Yohani Kinyala Lauwo guided Hans Meyer to the summit of Mount Kilimanjaro. “Lauwo,” as he is often referred to, was only a teenager when he was chosen by local Chagga leaders to guide the European expedition on the first known ascent to the highest point in Africa. One hundred years after this first ascent of the legendary mountain, Lauwo was able to attend the centennial celebration of the climb, as he lived until May of 1996. The 107 years between the first known ascent of Kilimanjaro and the death of Lauwo brought massive changes to the area around the mountain and the country of Tanzania. And the subsequent decades have only hastened these changes and the broader geography that surrounds protected areas such as Mount Kilimanjaro.

With its vibrant and youthful population, abundance of natural resources, diverse wildlife, and its tradition of valuing and protecting special places, Tanzania is an accelerated microcosm of how the modern geography of protected areas is changing

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across the world. Three key factors are intersecting rapidly and intensely in Tanzania forcing the country to grapple and experiment with efforts to protect some of the world's most beautiful and threatened resources: (1) the amount of Tanzanian land dedicated to protected areas has grown rapidly over the past century; (2) tourism in Tanzania has expanded; and (3) Tanzania's population is accelerating. Compared with the population in 1889 when the expedition summited Uhuru Peak, Tanzania's population has experienced considerable growth and is projected to more than double its current population by 2050.

On the day Lauwo led the expedition in 1889, the concept of a national park was just emerging (with the designation of Yellowstone National Park as the world's first national park in 1872). Currently, Tanzania is home to 16 national parks, 28 game reserves, 44 game controlled areas, 1 conservation area, and 2 marine parks (UNWTO 2018), as well as 7 world heritage sites (UNESCO 2019). And while Lauwo and the British expedition were the first group known to summit Kilimanjaro, thousands of people each year now make the trek. All of these factors provide the context for the research presented in this book and bring different pressures and challenges for Tanzania's protected areas.

1.1 Tanzania's History of Protecting Special Places

Conservation is an important value for Tanzania. Over 40% of the country is set aside for wildlife conservation or various other forms of protected areas (Kijazi *n.d.*). Protected areas include national parks, conservation areas, game reserves, grasslands, mountains, archeological sites, and world heritage sites.

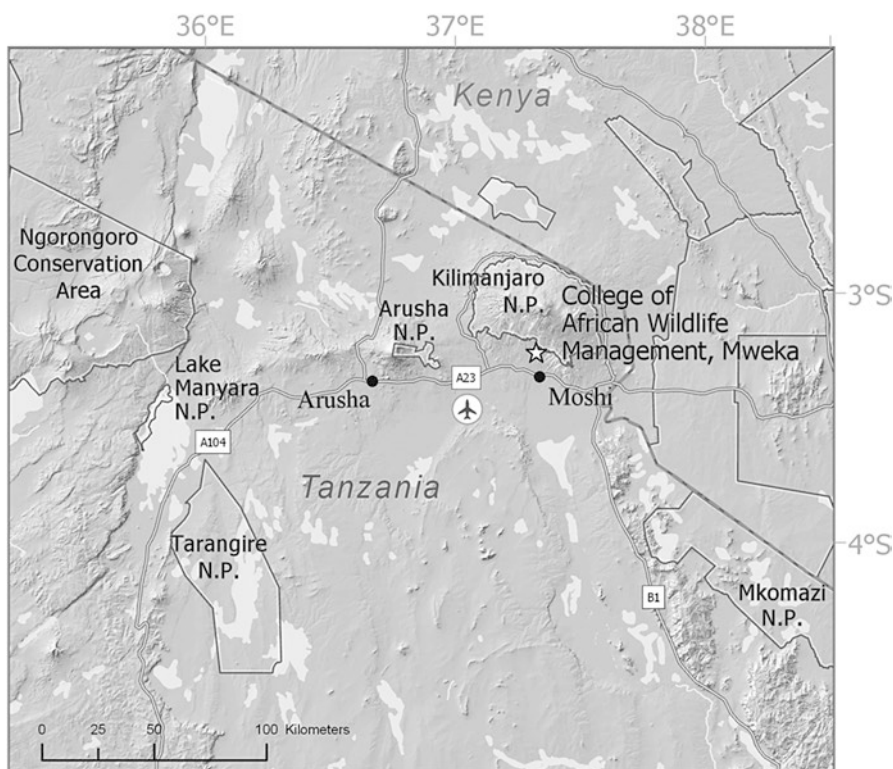
While Tanzanian history provides some insight into how the idea of protected areas originated, Tanzania has taken significant actions since independence to define how it will protect its special places. Restrictions established during the colonial period, such as on hunting, were often continued or extended after independence (Kijazi *n.d.*). But since independence, Tanzania has expanded protected areas and undertaken different efforts to involve or benefit local populations, with differing levels of success. In what has become known as the Arusha manifesto, the first president Julius Nyerere articulated the importance of Tanzania's flora and fauna not only to Tanzania but also to the world:

The survival of our wildlife is a matter of grave concern to all of us in Africa. These wild creatures amid the wild places they inhabit are not only important as a source of wonder and inspiration but are an integral part of our natural resources and our future livelihood and well-being. In accepting the trusteeship of our wildlife, we solemnly declare that we will do everything in our power to make sure that our children's grandchildren will be able to enjoy this rich and precious inheritance. The conservation of wildlife and wild places calls for specialist knowledge, trained manpower, and money, and we look to other nations to cooperate with us in this important task – the success or failure of which not only affects the continent of Africa but the rest of the world as well. (Kideghesho 2008)

In addition to expanding the number of protected areas, Tanzania has taken other significant steps to facilitate the protection of its resources, such as the establishment of the College of African Wildlife Management, which provides competent

and informed wildlife managers and has become a leader in quality wildlife management training in Africa. The Tanzania Wildlife Research Institute (TAWIRI) also helps coordinate and supervise quality wildlife research throughout the country.

Tanzania has expanded its national park system from 3 parks that existed at independence in 1961 to 15 current national parks. One example of national park development is provided by Mount Kilimanjaro. Mount Kilimanjaro is the tallest mountain in Africa and the tallest freestanding mountain in the world. In 2016, Mount Kilimanjaro was declared Africa's leading tourist attraction by the World Travel Awards Africa at the Indian Ocean Gala Ceremony in Zanzibar. Mount Kilimanjaro was first designated as a game reserve in 1910 and was later recognized as a forest reserve in 1921. It was established as a national park in 1973 but was not opened to the public until 1977. The park was recognized as a world heritage site by UNESCO in 1987 and voted as one of the Seven Natural Wonders of Africa in 2013. Kilimanjaro covers an area of 1668 km² and sees approximately 25,000 visitors every year. Tanzania National Parks Authority (TANAPA) has established seven official hiking routes on the mountain with 31 camping sites. Logging, fires, and the conversion of montane forest to softwood plantations have dramatically changed the montane forest on the slopes (Fig. 1.1).



Christopher Higham and Ryan Shields, ThinkSpatial, BYU Geography

Fig. 1.1 Kilimanjaro area in Northern Tanzania

1.2 Pre-Independence

During the Berlin conference in 1884–1885, Germans were given control over what was then called Tanganyika. The Germans used questionable treaties and imperial charters to assert authority over the land. Germany implemented the first wildlife hunting law in 1891, which severely limited the local populations' ability to hunt by banning the use of indigenous weapons. The licensing fees were expensive, and natives were not allowed to own rifles, effectively barring them from access to the resources and wildlife upon which many depended for life (Kideghesho 2008). Ironically, during Germany's movement to stop "cruel, wasteful and barbarous African hunting" purportedly to prevent depletion of the big game, European hunting in Tanzania was only increasing. The result of the German measures "was to convert ... wildlife from a locally used and customarily managed component of the natural resource base, to a resource which Europeans largely possessed exclusive legal access to" (Nelson et al. 2007 p 236).

The German administration also established some protected areas, with 14 by 1913 that covered approximately 3% of the territory's land (Koponen 1994 p 538–540). "As a rule, however, local people continued living in these areas based on their customary rights to occupy land, although there as elsewhere, their rights to use wildlife itself were significantly curtailed" (Nelson et al. 2007 p 236).

After Germany's defeat in World War I, German colonies were divided among the allied nations and Britain gained control over Tanganyika in 1920 (Kideghesho 2008). The British administration, like the Germans, viewed wildlife as a valuable source of economic revenue (Kideghesho 2008), and British colonial conservation policy sought to promote economic interests while also catering to conservation groups' demands to preserve the exotic animals, especially the larger ones. Under British rule, however, there was little to no focus on the well-being of the local people or their connection to preserving areas or protecting the animals. Through the 1950s, British policies increasingly focused on protecting land and wildlife while limiting local access and involvement. The game preserves often imposed high costs on the nearby populations, who lost access to resources such as firewood, food, medicinal plants, grazing areas, and spiritual sites (Kideghesho 2008). For example, when the Serengeti National Park was established in 1959, resident Maasai pastoralists were removed from the park (Neumann 1998). A new National Parks Ordinance "extinguished all customary land rights of communities living in the Serengeti and any future national parks, meaning that local people were henceforth not allowed to live in these areas" (Nelson et al. 2007 p 237).

Under British rule, all wildlife was declared to be property of the Queen of England, and the preserves were often referred as "the Queen's farm" (Kideghesho 2008 p 2). A British organization, the Society for Preservation of Flora and Fauna for the Empire (SPFFE), advocated to increase the protected status of several game reserves to the more restrictive category of National Parks. Major Richard Hingston, a representative of this group, traveled to East and South Africa to investigate such possibilities and returned with the recommendation that humans should be evicted

from these protected areas (Kideghesho 2008). However, there was some British recognition that local populations should benefit from their country's natural resources. Sir Donald Cameron, the governor of Tanganyika in 1926, declared, "The interests of the people must be paramount...the conventional attitude as regards game preservation requires revisions" (Neumann 1998).

1.3 Post-Independence

Tanganyika and Zanzibar gained their independence from Great Britain in 1961 and united to form Tanzania in 1963. Tanzania retained several of the colonial conservation practices, and, according to Kideghesho, the new Tanzanian government was often even more strict in its conservation efforts (Kideghesho 2008). Economic opportunity was a significant motivating factor, but now economics were more closely connected to national interests rather than just protecting exotic animals. Tanzania's first president, Julius Nyerere stated, "I personally am not interested in animals. I do not want to spend my holidays watching crocodiles. Nevertheless, I am entirely in favor of their survival. I believe that after diamonds and sisal, wild animals will provide Tanganyika with its greatest source of income. Thousands of Americans and Europeans have the strange urge to see these animals" (Levine 2002 p 1047).

Nyerere's observation was accurate. Hundreds of thousands of Americans and Europeans now flock to Tanzania each year to see the animals as well as Tanzania's other natural wonders like Mount Kilimanjaro. The country's natural resources provide great economic opportunity.

Tanzania built upon the Tanganyika National Parks Ordinance CAP, which was passed in under British rule in 1959, and established the organization now known as Tanzania National Parks Authority (TANAPA) to govern its national parks. After independence, no radical changes were adopted to address the customary rights to the natural resources the local people lost during the colonial regime (Neumann 1996; Levine 2002). Instead, the wildlife-related benefits were targeted toward the entire nation and encouraging foreign interests, rather than the communities living near the wildlife who bore the heaviest costs associated with its protection and conservation such as threats to crops, livestock, and livelihoods. "Tanzania's rural villagisation programmes of the mid-1970s, where up to 5 million Tanzanians were relocated, with little heed paid to pre-existing land rights or claims, represented an unprecedented effort by the state to shape rural patterns of land use and livelihoods" (Nelson et al. 2007 p 239).

However, since the 1990s, at least in theory and on paper, more focus has been put upon local populations and their involvement in both the management and benefits of protected areas. In 1998, the Wildlife Policy of Tanzania was enacted, which promoted local participation in wildlife management and promoted community-based conservation. Although the state retains ownership of wildlife, the Wildlife Policy states, "It is the aim of this policy to allow rural communities and private land

holders to manage wildlife on their land for their own benefit” (MNRT 1998p 14; Nelson et al. 2007 p 243). However, the results of this policy have not materialized, and some have written that control over wildlife and hunting has become even more centralized than in 1998 when the policy was enacted (Nelson et al. 2007 p 247).

Conservation in Tanzania is still governed by the Wildlife Conservation Act of 1974, although there has been pressure for adoption of community-focused policies similar to the Wildlife Policy [verify]. The Wildlife Conservation Act allows the government to establish protected areas and outlines how these areas are to be organized and managed. National Parks represent the highest level of resource protection under the Act and the core business of TANAPA (TANAPA 6 July 2019).

Another management body, the Tanzania Wildlife Management Authority (TAWA), was established under the Ministry of Natural Resources and Tourism in 2014 (TAWA 6 July 2019). TAWA is responsible for administering the sustainable management of wildlife resources and biodiversity conservation outside the National Parks and the Ngorongoro Conservation Area. This means management of an area that represents 79% of the total protected areas in Tanzania (approximately 169,553 km²). These areas include game reserves, game controlled areas, and open areas.

1.3.1 Tanzania National Parks and Protected Areas Within a Global Context

Since independence, wildlife management in Tanzania has remained largely centralized, featuring large state-protected areas and strict controls on resource use and access. While there have been several attempts to adopt global management ideals that local communities should be closely involved in and benefit from decentralized wildlife management, the reality on the ground remains highly centralized. Local control is strongly supported by nonprofit environmental groups, large donors, foreign conservation organizations, and official government policies. But despite the good intentions and even official policies, centralized control over wildlife and protected areas continues to be the norm, with local communities a mere afterthought at best.

1.3.1.1 IUCN Categories

The International Union for the Conservation of Nature (IUCN) created global categories of protected areas that range from Category I (a strict nature reserve with little to no human interaction) to Category VI (a protected area where human interaction is a vital part of the protected area). The IUCN categories have moved beyond a simple description to helping decision-makers categorize their priorities for an area and adjust the area’s management and policies accordingly. The IUCN defines

a protected area as “A clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values” (IUCN and WCPA 2013).

The six categories reflect different priorities and protection goals and have been largely adopted to describe protected areas throughout the world. Below are brief descriptions of these protections.

Categories Ia and Ib: Strict Nature Reserve/Wilderness Areas

Strictly protected areas set aside to protect biodiversity, natural character, and potentially geological/geomorphic features. Human visitation, use, and impacts are strictly limited to preserve the natural character of these places. Such protected areas can serve as indispensable reference areas to measure human impacts through scientific research and monitoring.

Category II: National Parks

Large natural or near-natural areas are set aside to protect large-scale ecological processes and the species and ecosystems. While there are protections against human impacts, National Parks are also meant to provide opportunities for visitors, education, and recreation.

Category III: Natural Monuments or Features

Areas are set aside to protect a specific natural feature such as a landform, seamount, submarine cavern, or a geological feature, such as a cave, or even a living feature, such as an ancient grove. Category III areas are generally smaller and often have high visitor value even without the large-scale ecosystem protection.

Category IV: Habitat/Species Management Area

These areas aim to protect particular species or habitats, and their management reflects this priority. Many Category IV protected areas need regular, active interventions to ensure that the requirements of particular species or habitats are maintained.

Category V: Protected Landscape/Seascape

A protected area where the interaction of people and nature over time has produced an area of distinct character with significant, ecological, biological, cultural, and scenic value. In these areas, safeguarding the integrity of these interactions is a key value.

Category VI: Protected Area with Sustainable Use of Natural Resources

These areas attempt to conserve ecosystems and habitats together with associated cultural values and traditional natural resource management systems. They are generally large, with the majority of the area in a natural condition while a portion is used for sustainable natural resource management. Low-level, nonindustrial, and sustainable uses of the natural resources are a key aim of these areas (IUCN 2013).

Table 1.1 National parks in Tanzania

Park	Size	Date
Arusha	552 sq. km (212 sq. miles)	1967
Mkomazi	3245 sq. km (1240 sq. miles)	
Mt. Kilimanjaro	1688 sq. km (651 sq. miles)	1973
Serengeti	14,763 sq. km (5700 sq. miles)	1959
Tarangire	2,850 sq. km (1,100 sq. miles)	1970
Lake Manyara	648 sq. km (250 sq. miles)	1960
Gombe	56 sq. km (21 sq. miles)	1968
Katavi	4417 sq. km (1727 sq. miles)	1974
Mahale	1613 sq. km (623 sq. miles)	1985
Rubondo Island	456 sq. km (176 sq. miles)	1977
Saanane	2.18 sq. km (0.84 sq. miles)	2013
Kitulo	412.9 sq. km (159 sq. miles)	2005
Mikumi	3230 sq. km (1250 sq. miles)	1964
Ruaha	20,226 sq. km (7809 sq. miles)	1974
Udzungwa	1990 sq. km (770 sq. miles)	1992
Saadani	1100 sq. km (424 sq. miles)	2005

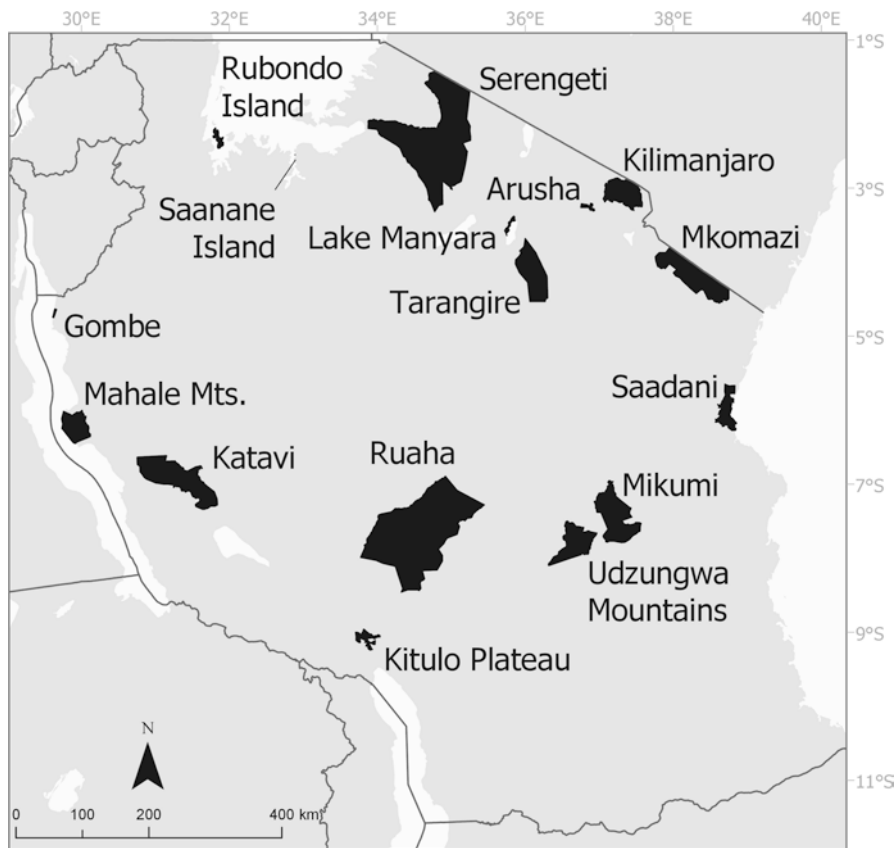
Protected areas have proliferated worldwide and now account for nearly 13% of the world's surface area excluding Antarctica (ICUN 2013). Since independence, Tanzania has expanded and developed the protected areas within its boundaries. Table 1.1 outlines the current protected areas that exist in the country (Fig. 1.2).

1.4 Tanzania's Growing Population

While accurate population figures are not available for Tanzania during Lauwo's famous summit in 1889, by using world population figures as a guide, it is likely that the population of Tanzania was somewhere around five million people. As shown in Table 1.2, the population of Tanzania has grown rapidly since then and is now ranked as the 23rd largest country in the world (World Population Review 2019).

Tanzania is projected to exceed 100 million people by 2037. It has the 18th highest population growth rate and birth rate in the world, with no signs of a slowdown (Population Reference Bureau 2018). Tanzania's population tends to congregate in fertile rural areas as well as key urban areas. There are about 53 people per square kilometer in the water-rich mainland highlands, which includes the Kilimanjaro area, and up to 134 people per square kilometer in the most densely populated urban areas such as Zanzibar. About 80% of the population lives in rural areas (Population Reference Bureau 2018).

As seen in Table 1.3, Tanzania is outpacing population growth trends in Africa generally and is going in the opposite direction of Europe whose population is projected to decline over the next several decades.



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Fig. 1.2 National Parks in Tanzania

Table 1.2 Tanzania's population source: US Census

Tanzania	1961	1990	2019	2050
Total population	10.5 million	24.8 million	56.9 million	118.6 million
Population density (people per square kilometer)	11.9	28.0	64.3	133.9

While Tanzania's total fertility rate is projected to decline over the coming decades—from 4.7% in 2019 to 3.1% in 2050—it is projected to remain slightly above Africa's rate (currently 4.2% and projected at 2.8% in 2050). This contrasts strongly with Europe's rate (projected at 1.7% by 2050) (US Census [n.d.](#)). Tanzania's high fertility rate is largely a function of the population's age structure that is younger than Africa's and dramatically younger than the world's and Europe's (Table 1.4).

Table 1.3 Population trends source US Census

	1890	1961	1990	2019	2050
World	1.5–1.7 billion	3.084 billion	5.286 billion	7.582 billion	9.488 billion
Africa		292.5 million	631.7 million	1.294 billion	2.412 billion
Europe				748 million	717 million
Tanzania	Approx. 5 million	10.6 million	24.8 million	57.0 million	118.6 million

Table 1.4 Population characteristics. 2018 World Population Data Sheet

	2018: % Population under 15 years of age	2050: % Population under 15 years of age	2018: % Population over 65 years of age	2050: % Population over 65 years of age
Tanzania	45%	36%	3%	5%
Africa	41%	32%	3%	6%
Europe	16%	15%	9%	16%
Global	26%	21%	18%	28%

Table 1.5 Percentages of people living in rural areas. 2018 World Population Data Spreadsheet

	% Population living in rural areas		% Population living in rural areas
Tanzania	66%	Europe	25%
Africa	57%	China	41%
Global	45%	India	66%
Most developed countries	21%	Least developed countries	67%

These numbers show the age characteristics that will lead to the projected population growth by 2050. Population projections have generally proven to be true over time; while minor adjustments may be made over the decades, large changes are very uncommon. Because of Tanzania's age structure, the people that will produce the population increases projected by 2050 have already been born, even though the most of the women have not yet reached their childbearing years.

While Tanzania's large urban areas are experiencing dramatic growth, the population in Tanzania will remain quite rural for the foreseeable future. With approximately 80% of its population living in rural areas, changing to a majority urban population will take place only slowly. This contrasts with the average global population, which became urban for the first time this decade. Table 1.5 shows how Tanzania compares with Africa and the world as to where its population is distributed.

As the table indicates, there are massive differences between regions and developed and undeveloped countries in terms of rural and urban population distribution. The most developed countries and the least developed countries, including Tanzania, have an almost inverse relationship in where their populations live.