




SWM SUSTAINABLE WILDLIFE MANAGEMENT PROGRAMME



Towards sustainable wildlife management

An in-depth study for the promotion of community conservancies in Zambia and Zimbabwe

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III. PRESENTATION OF THE INTERVENTION SITE

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Introduction

The SWM Programme in KaZa is being implemented in Zambia and Zimbabwe. It is promoting the model “Community conservancy as a basis for a nested wild and domestic meat supply promoted for protein and income”. The sites are, in Zambia, Inyasemu and Simalaha Community Conservancies, and in Zimbabwe (Binga), Mucheni Community Conservancy. The two countries are part of the KaZa zone, and the link with the KaZa-TFCA Secretariat in terms of wildlife conservation is of major interest. The three conservancies are at various levels in their development, and points of similarity and difference among these three CCs in terms of geographical, biophysical and human environment can be described.

Materials and methods

This chapter is based on several studies that have been conducted by the SWM team in KaZa and by experts contracted from the beginning of the programme in order to have the best possible knowledge of the environment in which the users of these conservation areas live, whether they are human populations, the livestock raised or the wildlife present. A landscape approach was systematically chosen for the conduct of these various studies in order to provide information to the political leaders as well as to the traditional chiefs, their councillors, and the village communities that depend on them. The aim was also to inform all of them of the various missions that took place in the field to collect the information. Meetings and interviews were held in respect of the social safeguards. The main studies on which this chapter is based are as follows:

- The ecological environment of Chizarira and Inyasemu landscapes (Mafigu, 2018; Namukonde, 2020);
- Hydrological assessment of Wards 3, 4 and 5 of Binga district and Inyasemu (Dzvairo, 2019; Sinda, 2020);
- Chizarira landscape consultative process (Cunliffe, 2019);
- The stakeholders' analysis in both countries (SWM, 2020); and
- Some additional information also comes from the atlas: *The mankind and the animal in the mid-Zambezi valley* (CIRAD, 2000).

A. Geographical environment

A.1. KaZa-TFCA

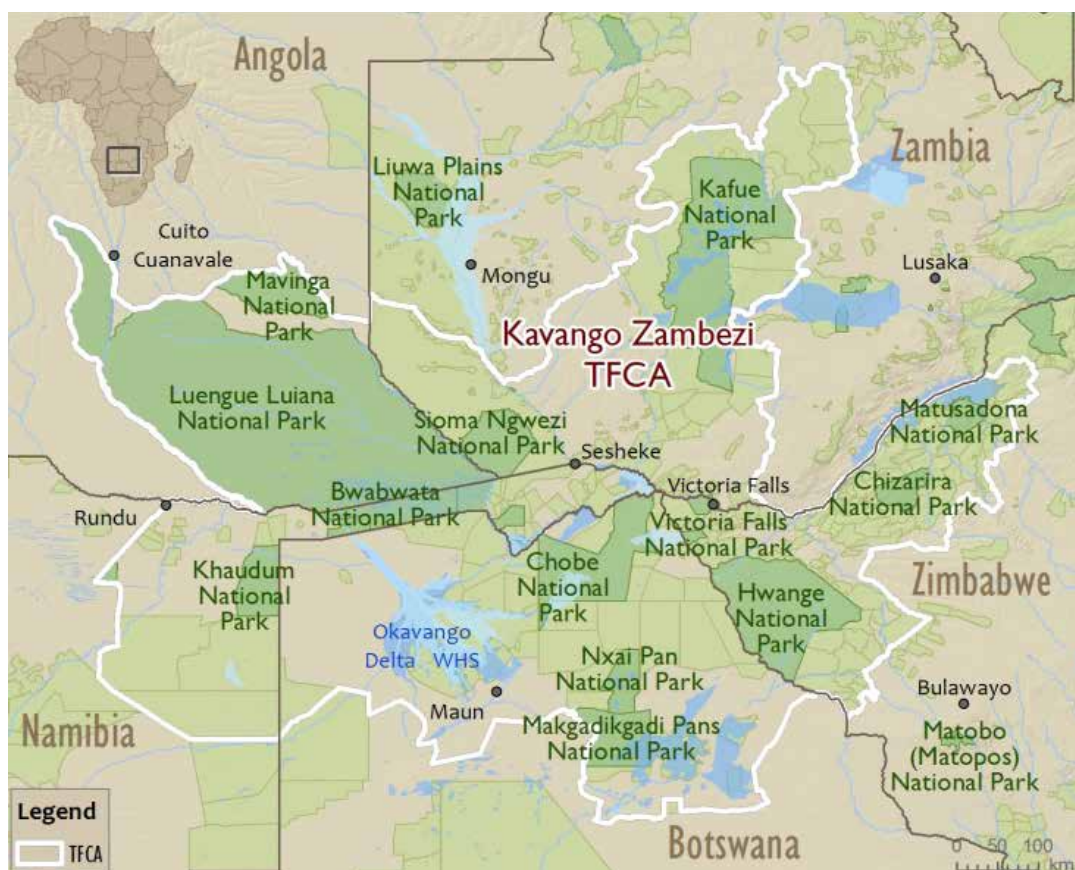
Southern Africa covers 6.8 million km² of land encompassing 12 countries all of which belong to the Southern African Development Community (SADC). The region sits on the southern African plateau characterized by rugged terrain, mountains, steep cliffs and river valleys, as well as flatlands on the bottom slopes that are widely used for cropping and pasture. In addition, the

terrain also presents a mosaic of grasslands, wetlands and woodlands that offer habitats for a wide range of wildlife species, including buffaloes, elephants, leopards, lions and rhinoceroses. Other species include antelopes, giraffes, hippopotamuses and various cats, which have become the basis of wildlife-based tourism in this region.

Wildlife-based tourism is the key economic activity, generating over USD 29 billion annually for southern Africa and employing 3.6 million people, and lately rural communities have begun to claim a stake in these ventures. Communities have benefited from wildlife and other natural resources through strategic government-supported policy interventions that helped the region to pioneer the involvement of communities in natural resources management. With close to 14.8 percent of the region's land mass under protected area (PA) status (forest and wildlife), the adjoining communities have over the years been actively collaborating with the respective central governments and this is the hallmark that forms the cornerstone of this sector (SADC, 2006).

Since inception, the region has been developing innovative ways of delivering effective nature conservation, and adopted the concept of transfrontier conservation areas, as laid out in the SADC Protocol of 1999 (SADC, 1999), that promotes shared cross-border conservation efforts. Most PAs in the region, as elsewhere in the world, are largely state-owned and managed often with various permutations of support from private sector, e.g. tourism, hunting/safari operators and other entities. Some of the PAs are located on borders, often enabling the seasonal movement of animals in search of food or required habitats, an aspect which was happening before the PA boundaries were put in place. This was noted by natural resources and wildlife management experts in SADC and considered as a basis for collaborative management of

Figure III.1:
Map of KaZa-
TFCA (Source:
www.peaceparks.org)



shared natural and cultural resources across international boundaries for improved biodiversity conservation and socioeconomic development.

One such area is the 520 000 km² wide Kavango-Zambezi Transfrontier Conservation Area (KaZa-TFCA) which was created from adjoining PAs in Angola, Botswana, Namibia, Zambia and Zimbabwe, and which is the largest transfrontier conservation area in the world (Munthali *et al.*, 2018). This area includes a major part of the Upper Zambezi River and Okavango Delta, the Caprivi Strip of Namibia, the south-eastern part of Angola, south-western Zambia, the northern wildlands of Botswana and western Zimbabwe (Figure III.1). The key objective of the KaZa-TFCA is to join fragmented wildlife habitats to form an interconnected mosaic of protected areas and transboundary wildlife corridors. The TFCA is headed by a secretariat based in Kasane, Botswana, which oversees the development and management of a series of wildlife dispersal areas as part of the conservation efforts for the member countries.

Following this monumental achievement and some fundamental rethinking in the region, smaller but more people-centred and managed CCs were suggested, introduced and adopted. This is a further desire to encourage and facilitate the direct involvement of rural people in natural resources management, and marked an important milestone in nature conservation, poverty reduction and empowerment in sub-Saharan Africa. Community conservancies, like the PAs before them, acknowledge the importance of ecological, physico-geographical and socio-cultural, anthropogenic factors that influence a specific area being managed by the communities that live within them for their own benefit (Sandwith *et al.*, 2001).

A.2. Community conservancies in Zambia and Zimbabwe

The two countries share a common boundary dominated by the Zambezi River, and have been facing similar threats to natural resources management in general and wildlife in particular. The major threats include habitat loss and/or degradation, excessive resource extraction, fragmentation, encroachment, poaching and climate change (Lindsey *et al.*, 2014). These factors, combined with poor governance, poverty, increasing human and livestock populations and illegal wildlife trade, continue to drive the loss of wildlife and the degradation of other natural resources in the region (Robson *et al.*, 2017). In particular, the increasing loss of large mammals that are central to ecosystem functions affects tourism in the region.

The potential CC sites in Zambia and Zimbabwe are linked to a broad range of PAs – from national parks, forest reserves and game management areas (GMAs) – and seek to address the management of habitat loss, degradation, fragmentation, encroachment, poaching and climate change.

B. Biophysical environment

B.1. General description

Under this initiative, the three CCs cover a combined area of 388 300 ha, of which Mucheni with 100 000 ha is the smallest and Simalaha with a coverage of 180 000 ha is the largest (see Figure II.1). As with much of southern Africa, conservancies are located in similar biophysical

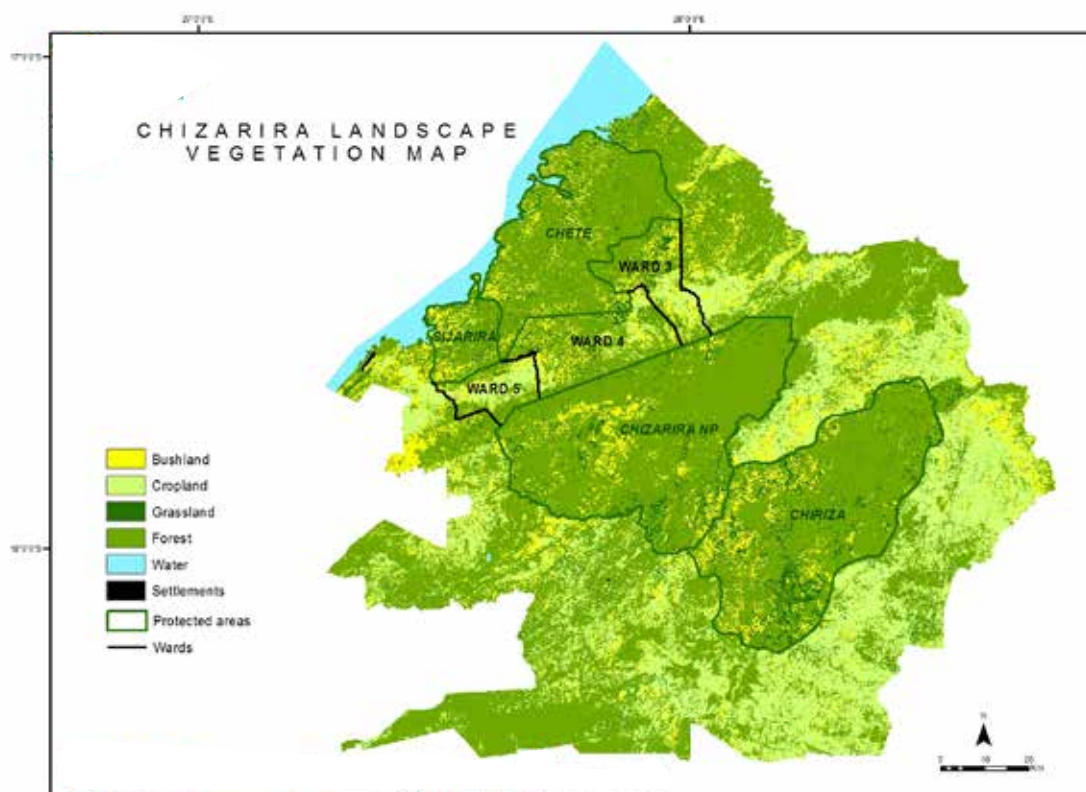
environments where physiographic features, soil characteristics, bioclimatic types and length of the growing period are critical attributes for wildlife (Muimba-Kankolongo, 2018). The CCs are located on rugged topography in dry zones. Mucheni is in Agroecological Zone (AEZ) 5, the driest category in Zimbabwe, while both Inyasemu and Simalaha are in Zambia's AEZ 1, which is also the driest category in Zambia. With rainfall in both zones varying from 400 to 700 mm, the recommended land use is less cropping but more livestock rearing and wildlife. The more specific descriptions of these key features are given in the sections below.

B.1.1. Climate

Rainfall across these sites – 400 to 700 mm – is considered low for arable cropping. Mucheni is a little wetter and reaching up to 1 400 mm in the abutting landscapes, e.g. Chizarira, while Inyasemu is the driest CC. Three distinct seasons are typical: (i) a warm wet season from November to April; (ii) a cold dry season from April to August; and (iii) a hot dry season from September to November. Climate models project that minimum and maximum temperatures in these areas could go up by anything between 10 °C and 30 °C by 2060 (Hulme, 1996), increasing the frequency and intensity of fires (Davis-Reddy and Vincent, 2017). Total annual rainfall is predicted not to change significantly, but the variability is expected to increase, leading to more droughts as well as to increases in the frequency of heavy rainfall events, which in turn may lead to an increase in floods (Davis-Reddy and Vincent, 2017).

The vulnerability of these CCs to such climatic changes is high compared to most other parts of the two countries due to their already limited agricultural potential and as indicated due to the fact that they lie in zones that are considered as more suitable for wildlife and livestock rearing.

Figure
III.2:
Chizarira
landscape
vegetation
map (Source:
L. Guerrini; in
Mafigu, 2018)



B.1.2. Ecosystem

The three CCs share similar types of vegetation dominated by dry forests and woodlands. The *Colophospermum mopane* woodlands are dominant and are found in the lowlands at elevations between 170 m to 800 m above sea level (Makhado *et al.*, 2014) while the miombo (the genera *Brachystegia* spp., *Julbernardia* spp. and *Isoberlinia* spp.) is met at higher altitudes of between 600 and 1 400 m above sea level (Chidumayo and Gumbo, 2010). In addition, riparian woodlands dominated by species such as *Diospyros mespiliformis*, *Khaya anthotheca*, *Parinari* spp. and *Syzygium cordatum* are found often along rivers, streamlines and grasslands. Other woodland types, albeit in small patches, include *Vachellia* spp., *Terminalia* spp. and *Combretum* spp. in various combinations. Soils under these vegetation types vary from light textured under miombo to clayey under mopane and vachellias. Tree heights vary with soil depth and effective rainfall. Under the best conditions, trees have heights ranging from 6–10 m, while under the worst conditions they are usually shrubby with a height range of 2–6 m and these are more pronounced in the mopane and the mixed thickets. An illustration of this ecosystem is given Figure III.2 in Zimbabwe, with PAs surrounding the three wards of Mucheni CC.

B.1.3. Natural resources

The vegetation described above provides habitats to a broad range of wildlife species across the three CCs. These range from mammals, birds, amphibians and reptiles to invertebrates, and some of these have a high conservation status as per the International Union for Conservation of Nature and Natural Resources (IUCN) Red List (IUCN, 2016). It is noted however that the populations of large and medium-sized mammals are extremely low, as only a few species may still be in existence with stable populations. These include woodland ungulates, namely kudu and common duiker, primates, namely vervet monkeys and baboons and carnivores. There are therefore many opportunities of contact between rural communities and wildlife which has over the years provided for the development of hands-on human–wildlife conflicts (HWC) mitigation measures. Although these attributes are common across the CCs, some subtle differences can be noted which are addressed in the sections below.

B.2. Inyasemu Community Conservancy (ICC)

Located in Kazungula District, in the Southern Province of Zambia, Inyasemu CC is 108 300 ha in extent and lies at an elevation of 900 to 1 200 m above sea level. It was established by four chiefs (namely, Senior Chief Inyambo, HRHs Nyawa, Sekute and Musokotwane, whose names' first syllables give the CC its name: Inyasemu). The CC lies on the Simalaha floodplain and shares boundaries with Sichifulo GMA, the Bombwe and Martin Tunga Forestry reserves. Given that position, it is part of the TFCA Wildlife Dispersal Area (WDA) which is an area defined as a unit of land where wildlife animals either breed or have their key habitat, and part of the thrust of the TFCA is to restore transboundary wildlife migratory corridors between such WDAs (Munthali *et al.*, 2018; KaZa-TFCA, 2014). Conversations are still ongoing with traditional leaders and the communities but studies carried out show its potential (Namukonde, 2020).

B.2.1. Climate

Zambia has three AEZs and the ICC lies in Zone 1 which is characterized by mean annual rainfall of less than 600 mm and experiences temperatures of between 20 °C–25 °C (Mukosha and

Siampale, 2009). The total and distribution of rainfall within a season vary greatly from year to year in this AEZ. The seasons defined above for all the CCs are significantly different except for the fact that highest precipitation and temperatures in some instances have been reported to last for seven months from October–November to April. Relative humidity is highest during the hot wet season (more than 70 percent in January) and lowest in the hot dry season (less than 36 percent in September). The area predominantly receives north-easterly winds whose speeds range from 6–11 m/s and begin to accelerate towards the end of the cold dry season. As with the rest of Zambia's Southern Province, climate change is affecting the region. It is likely that variability will increase and cropping will become even harder to realize.

B.2.2. Ecosystem

Inyasemu CC ecosystem is largely influenced by the annual seasons and the associated distribution of water, soils and human activities that, in turn, influence the distribution of the flora and fauna and their interrelationships. The ecosystem is endowed with a diversity of vegetation types that serve as unique habitats for wildlife and offer a number of ecosystem products and services to the local community. The main vegetation types are pretty much as described in the sections above, but, in the ICC, the miombo woodlands are found in the eastern part of the conservancy while the more dominant mopane woodlands are located in the western part of the conservancy. The area also has other forests such as *Baikiaea* forests confined in several patches to the north, west and central parts of the conservancy. The conservancy does hold some riparian forests which are confined to major rivers and tributaries. Grasslands are prominent on the western boundary of the conservancy around rivers and streams. Human habitation and cultivated lands are heavily concentrated along major rivers and streams creating a man-made or human-induced habitat.

The Sichifulo, Machile and Lunungu Rivers and their tributaries provide the main water sources for Inyasemu CC including its surrounding areas. Tributaries of these major rivers dry up during the early dry season, but often several pools are left in the main river courses and may last well into the hot dry season. However, in recent years these pools on and along the main river courses have been reported to be drying much earlier with changes in climate (variation in rainfall and general decrease in amounts). In addition, livestock grazing and increased settlements along the main rivers (mainly for seasonal agriculture) have contributed to the siltation of the main rivers and streams in the conservancy. The drainage system, including the wetlands, provides habitats for wildlife and communities who have settled to cultivate close to the river, creating a possible HWC problem.

B.2.3 Natural resources

The baseline survey (Banda *et al.*, 2019) report shows that natural resources for the ICC vary from forests and woodlands products, to fish and wild animals. Iconic tree species include the baobab, and other fruit trees that are of value to the communities. These have hardly been exploited, with the exception of tubers like lusala (*Dioscorea hirtiflora*) and munkoyo (*Rhynchosia heterophylla*) (Banda *et al.*, 2019; Mulenga, 2020). The ICC's rivers and streams hold limited fish species, but *Oreochromis niloticus* and *O. andersonii* have been noted (de Verdal *et al.*, 2018). The major natural resource in this CC is wildlife which has been estimated to be over 30 mammals, 413 birds, 60 amphibian and reptile, and 900 invertebrate species. Of these, 14 have a high conservation status (Namukonde, 2020) and are often encountered around water pools,

in cultivated lands, forests and woodlands. Most of the wildlife that existed in the proposed ICC seems to have shifted its distribution to the north, in Sichifulo GMA where a number of large and medium-sized mammals still exist. Inyasemu CC has the potential to re-establish wildlife populations, given that the conservancy still hosts viable habitats (large-to-medium-sized forest and woodland for ungulates and carnivores) and populations of a few large and medium-sized mammal species. Therefore, there is a need to establish mechanisms and strategies that will reduce illegal harvests and settlements. People are largely rural and carry out activities based predominantly on extensive mixed agricultural production (rain-fed crop production, livestock rearing, even though agriculture is quite challenging in ICC due to erratic rainfall, poor soils and frequent droughts in the area) and use of natural resources (seasonal fishing and hunting), as presented in Chapter VII.

B.3. Simalaha Community Conservancy (SCC)

The Simalaha Community Conservancy (SCC) spans the chiefdoms of the Sisheke Chiefdom (located in the Mwandi District) and Kazungula districts. It provides a corridor between the Chobe National Park (NP) in Botswana and Kafue NP in Zambia. Established by Senior Chief Inyambo Yeta and HRH Sekute, the CC is one of the first community conservancies in Zambia. It is under one of the country's oldest and most structured traditional natural resource management systems. As part of KaZa's Zambezi-Chobe floodplain WDA, the SCC encompasses large areas of seasonally inundated lands. It is one of the first entities to re-establish wildlife populations and their migration routes.

B.3.1. Climate

Simalaha CC lies in AEZ 1 of Zambia and, as already observed, is best suited for livestock and wildlife rearing. With a mean annual rainfall of 600 mm to 800 mm, arable agriculture is severely limited. Rainfall is usually erratic and poorly distributed, resulting in frequent dry spells in the conservancy. Temperatures are not any different from Inyasemu; they average around 16.4 °C, but can peak at up to 32.0 °C or beyond. Cropping is difficult in this terrain although local communities still carry out some agriculture activities.

B.3.2. Ecosystem

The ecosystem of SCC is similar to that of ICC which is largely influenced by seasonal changes. SCC, which is part of the semi-arid plains of Mwandi District in the Western Province of Zambia, is heavily influenced by the Zambezi River with predominantly infertile soils, mainly coarse sands, and alluvial. There are also portions of slightly acidic loamy and clayey soils with loamy topsoils. The SCC faces challenges such as "slash and burn" agriculture, deforestation and poaching, which lead to loss of soil fertility, decreased water retention and, as a result, loss of income and increase in households' vulnerability. These have had negative impacts on biodiversity, wildlife habitat and ecological corridors, thus negatively affecting tourism potential, again causing a potential loss of income.

B.3.3. Natural resources

The SCC is dominated by the Simalaha floodplain, bordered by mopane woodland and mixed woodland vegetation which forms important wildlife habitat. The SCC has valuable plants (including timber) and animal species, but wildlife population densities are relatively low at present. Thus,

there have been efforts to translocate animals from other regions so that benefits are to be realized from their sustainable use. The first wildlife restocking in the conservancy (100 impalas, 135 blue wildebeests and 50 zebras) was jointly operated in 2013 by the government and the private sector, mainly Peace Parks Foundation (PPF). More than 1 200 animals have been reintroduced since then with over 1 600 head of game reported in the animal sanctuary as of 2020. No quota for wildlife hunting has yet been allocated by the government to the Simalaha CC, as wildlife numbers are considered in need of supplementing by more translocations for consumptive offtake to occur. The rural economic base also includes livestock production and fish production, through 19 community-owned fishponds with capacity for 27 tonnes of annual fish production and the potential of numerous natural water reservoirs suitable for fish farming/production, including the potential Zambezi River fish reserves; these activities are supported by good accessibility. Agriculture is challenging, as the area has poor soils and some conflict with the wildlife that is present.

B.4. Mucheni Community Conservancy (MCC)

The 100 000 ha Mucheni CC lies in Wards 3, 4 and 5 of the communal areas of Binga District in Matabeleland North province of Zimbabwe, adjacent to Chizarira National Park (NP), Chete Safari Area (SA) and Sijarira Forest. The MCC lies at an altitude of 480 m in the low-lying areas to 1 439 m at Mt Tundazi on the Chizarira escarpment (Mafigu, 2018).

Wildlife populations and benefits accruing to the community had nearly disappeared in the wards due to poaching, mostly in Chete SA. The community came together under the Ward Development Committee with guidance from the local councillor and Chief Sinansengwe (in Ward 4) and decided to form a community conservancy as a solution. The process was initiated in 2014. After four years, poaching has reportedly been reduced and wildlife sightings have increased. HWC occurs within MCC mainly at water points and in fields; the main problem animals include elephant, baboon, hippopotamus, lion and hyena.

B.4.1. Climate

The climate of Binga, like the other two CC sites, is semi-arid with rainfall varying from 400 mm to 600 mm annually, although higher figures have been recorded in the adjacent Chizarira NP which is at a higher altitude. Rainfall season is from late October to March of the following year although changes have been noted which can be attributed to climate change, and lately floods were experienced in the area. Temperatures range from an average of 20 °C in winter and 30 °C in summer, reaching 45 °C during the hot dry period.

B.4.2. Ecosystem

The southern part of the MCC starts on the foot of Chizarira escarpment and along major rivers such as the Mucheni, Lwizilukulu, Chininga, Kasanse and Mbalule. The escarpment is deeply dissected by spectacular gorges that in some places are over 100 m deep. Both large and small river systems support enclaves of riparian gallery forest beginning at the base of the escarpment with distribution determined by the presence of alluvial soils. Gallery forest is also present downstream of perennial springs that also rise at the foot of the escarpment. The natural vegetation is predominantly mopane and miombo woodlands with some patches of *Combretum* species. Although highly diverse with dominant species determined by altitudinal and topographic variance, vegetation is broadly categorized as *Combretum*, Jesse bush (Lowveld

scrub including *Vachellia*), miombo (*Brachystegia* spp. and *Julbernardia* spp.), mixed (including *Adansonia* spp., *Acacia nigrescens*, *Lonchocarpus* spp., *Terminalia* spp.), *Colophospermum mopane*, and Riverine (gallery) Forest (Deacon *et al.*, 2020). The rocky outcrops and highlands are covered with thick mixed woodland *Commiphora* species and *Sterculia* spp. This veld is characterized by diverse species including grasses that are palatable throughout the year thus presenting a typical sweetveld. Vegetation further reflects land use that includes pristine wilderness through to substantially altered landscape, where it has been cleared for agriculture. Within the boundaries of the MCC there is also an area of reclaimed wilderness that was previously used for agriculture and human settlement.

B.4.3. Natural resources

The MCC is heavily influenced by the adjacent national park, forest reserve and safari area and the associated ecological systems. The entire landscape is dominated by a broad range of animals varying from elephant, buffalo, lion, leopard, wild dog, spotted hyena, hippo, kudu, roan antelope, bushbuck, waterbuck, to the common duiker, impala. As with most of these human-settled areas, there has been a dwindling of the wild species' numbers due to factors such as drought, poaching and the lack of water. There are indigenous fruit trees available in MCC such as *Adansonia digitata* (baobab), *Tamarindus indica* (tamarind), *Berchemia discolor* (the bird plum) and *Sclerocarya birrea* (marula). These could be commercially exploited under an appropriate model and contribute to improvement of livelihoods of people.

C. Human environment

C.1. General description

The people in the three CCs live off the land, but cropping and livestock still remain as major activities. Arable agriculture is challenging, as the three areas have poor soils and often experience severe droughts which are worsening due to climate change. Due to the presence of wildlife, issues pertaining to HWC are prevalent. Across the CCs, poverty remains a major challenge as most of the households (HHs) can be classified as "asset poor". Most of these households are vulnerable not only because of their relative poverty, but also because they have few assets to sell should they be forced to find money for food or other emergencies. Some residents have livestock as their number one asset. Water is primarily sourced from boreholes, followed by shallow wells on and along river channels. Some water is drawn from the rivers when the rains are in abundance.

Across the CCs, tribal leaders are recognized by local communities and the two governments. Traditional leaders are central to the adoption and development of the CCs and have been powerful advocates for their establishment. Lately, local-level democratic institutions in the form of these district councils have come to the fore, but at this level are often dominated by opposition parties.

C.1.1. Demography and ethnic composition

The three CCs are sparsely populated with 11 000 households in Inyasemu, 1 294 in Simalaha and 3 390 in Mucheni, with the bulk population being under 15 years. The populations across the

three CCs are largely rural and access land under (customary) communal management. HH sizes vary from 6.6 (Inyasemu), to 6.0 (Simalaha), to 4.2 people per household in Mucheni.

Natural resources management starts at the village level and remains central to the management of the CCs. Across the three CCs, Tonga culture is dominant, but less so in Simalaha CC, where Lozi culture is stronger. In addition, the Toka-Leya culture is found in the Inyasemu CC. Across the three CCs, other tribes have migrated to these areas and are now part of the social rubric.

C.1.2. Health and food security

Malaria remains a major health issue, followed by diarrhoea and malnutrition across the CCs. In the absence of mobile units, health services are hard to access, and it would seem in some instances communities walk or travel long distances to access clinics. As noted in Inyasemu CC access to health services can be affected by poor road networks, especially in areas where roads are impassable in the wet season. However, mobile health services are provided by the government, and mission hospitals to needy people. Across the CCs, the need for childcare and maternity care is critical and at the same time health awareness is needed.

Across the CCs, communities face the perennial problem of accessing clean potable water. Most communities draw water from rivers where the water may not be treated, hence the high incidence of diarrhoea across the CCs. In some cases, the boreholes drilled may produce salty water not suitable for human consumption.

Baseline surveys carried out during the SWM Programme in KaZa showed that high numbers of HHs across the CCs experience some food shortages, especially in the late dry season. Food shortages are severe from September to March, a period which is also characterized by severe malnutrition in children. The severity of food shortages varies by CCs but their regularity is of concern across the CCs, a situation often ameliorated by food relief provided either by the United Nations (UN) or NGOs.

C.1.3. Types of houses and energy sources

Significant differences are noted of the different qualities of housing across the CCs. The dominant structures are houses built with pole and dagga, or mud and fired bricks as well as concrete blocks. Most of the houses are roofed with thatch grass, iron and some "old" houses under asbestos sheets. In the same homesteads, other structures mostly made of wood include granaries and cattle and goat pens. In some cases, the latter must be able to withstand predators where livestock is concerned. The most common source of energy for cooking and space heating for most HHs in the CCs is firewood with a few in Inyasemu and Simalaha using charcoal even though the bulk of that is sold. In addition, most of the households cook on a three-stone open fire with either steel or clay pots. Alternative cooking fuels are severely limited although there is a significant increase in the use of solar equipment for lighting and powering radios and cell phones.

C.1.4. Poverty and livelihoods

Livelihoods across the CCs are provided through arable agriculture and crop sales, livestock rearing, hunting, seasonal (shows limitations) fishing and other small-scale businesses such as grocery shops, as well as trade in poultry. The average size of landholdings per HH varies across the CCs with some having as much as 11 ha and others as little as 3 ha of user rights in the form of communal grazing. Two types of lands are often available to HHs across the CCs: permanent

fields and fallows. Maize is the main crop produced, but production rates, at less than 1 tonne per ha, are considered generally low. Constraints mentioned across the CCs are drought and low rainfall, while access to agro-inputs is of major concern. Consequently, these constraints contribute to the poverty levels in the CCs. As for livestock, the main species reared include: cattle, pigs, goats and chickens, but the lack of water for livestock is also one of the biggest problems facing these areas (Chapoto *et al.*, 2017). This is often exacerbated by the challenge of lack of markets, often causing communities to be cheated by middle marketers, and by distance from feed outlets and veterinary services (see Chapter VII).

C.1.5. Education

Across the CCs, education is far from good. Some schools offer low classes and students have to travel long distances to go to school. Where schools are in place, there seem to be severe shortages of learning materials and books, and in these CCs some students do not have desks. In Simalaha and Inyasemu, community-built schools are in place, but most of these are not well equipped and also do not attract good teachers. Right across the CCs the need to address school infrastructure, including teachers' housing, should be a priority. While the infrastructure for schools is a high priority, most of the HHs in the three CCs pay little regard to girls' education. For most HHs men would probably have gone to secondary school (up to Grade 12 in Zambia), but very few go beyond that. As for women, they often stop at grade 7 and are often married off or are stopped because the HH is constrained with respect to school fees. There are challenges with staffing, as teachers have to travel long distances to schools, resulting in the hiring of untrained teachers in remote schools. The overall school pass rate is very low. In MCC some children attend school irregularly due to food insecurity challenges.

C.1.6. Communication network

The road network across the CCs is bad, with one all-weather road and a series of gravel roads cutting through them. Roads leading to schools and clinics (where available) are generally not well maintained and negatively affect the movement of pupils and patients, as they have to walk long distances to access services. Transporters also do not like to use these roads as their vehicles are often damaged. Mobile telephone communication networks are available in all the three CCs but the key constraint is coverage; though the need to use these facilities exists, the number of users does not commercially justify widespread scaling up of the towers and repeater stations.

C.2. Specific human environment issues

The common and shared human environment characteristics for the three CCs have been presented in the sections above but it is noted that there are some aspects that are peculiar to each CC.

C.2.1. ICC and SCC in Zambia

ICC shares the aspects that have been raised above, but human environment issues differ from others in that human–wildlife issues are intense, and when these are linked to some areas of poaching, the conflict between people and government becomes dramatic. The CC is a product of similar thinking involving four chiefs who view their communities as being severely constrained. They agree that there is widespread poverty notwithstanding the presence of wildlife. They have repeatedly raised issues pertaining to drought and water shortages, low

agricultural productivity and limited development opportunities. The communities have not sustainably exploited the forest and fish resources in a manner that can contribute to poverty reduction due to a combination of factors including lack of markets for products and poor road network. The need to change mindsets is at the top of their thinking so that livelihoods can be improved, for example, through awareness-raising campaigns on sustainable practices that the SWM Programme in KaZa can promote. While the chiefs have taken the mantle for championing development issues, the District Councils are also active and, together with NGOs, have been addressing the same challenges facing the communities.

SCC's human environment is dominated by agricultural activities which are largely low in productivity. Livelihoods are centred on livestock production, dryland cropping and fishing. Due to disease, drought and overfishing, all these three options have contributed very little in attempts to alleviate poverty within the region. There are also human settlements and associated infrastructure but no major industrial activities. The settlement pattern of people in the area shows a strong correlation with linear features such as roads, drainage lines and the relatively richer soils along the edges of floodplains and *dambos* (waterlogged grassland areas) as well as permanent water sources. The two chiefdoms recognize the potential that the CC can provide direct benefits to employment opportunities and nature conservation; especially given that this is a dry area suitable for livestock and wildlife management.

The area is under a traditional land tenure system dominated by the Lozi and Tonga cultures. The communities are currently engaged in a natural resource management programme under the community conservancy concept. The formulation of rules to govern wildlife and fish in the surveyed areas is in the hands of the local traditional leadership: the Village Action Groups (VAGs) report to the headmen/headwomen over the happenings in the community, and only in extreme cases do the headmen/headwomen report to the chief.

C.2.2. MCC in Zimbabwe

A first conservancy in Mucheni was conceived in Ward 4 by Chief Sinansengwe and his people. The idea came after the Chief had realized that wildlife populations were on the decline and that the threat of extinction of some species was imminent. Wildlife populations have been perceived to be on the increase since the establishment of this conservancy in 2016 through a council resolution. The initial conservancy of 7 000 ha in extent is a contiguous piece of land adjacent to Chizarira National Park. The SWM Programme in KaZa plans to support extension (to cover approximately 100 000 ha) of Mucheni Community Conservancy through incorporation of Wards 3 and 5 which are next to Ward 4. With proper land-use planning, the expanded MCC will provide a wider habitat for wild animals as well as important links or wildlife corridors with surrounding protected areas, namely Chete SA, Chizarira NP and Sijarira Forest. Proper land-use planning will also reduce negative interaction between humans/livestock and wildlife. Livestock production (small stock included) as well as irrigated crop production in suitable areas will also improve the livelihoods of people in these dry areas where choices are limited leading to dependence on food handouts. This landscape approach seeks the consent of Chiefs Sinakoma (Ward 3) and Sinampande (Ward 5) and their communities in the other two wards, as well as the consent of Chief Sinansengwe, to work with the neighbours. The process of engagement of the three wards for an expanded MCC is still ongoing, with the District Development Coordinator and Council support expected to facilitate the collaboration. To promote the cohesion of the communities and their traditional and political leaders, the SWM Programme in KaZa made

the choice in each ward: (i) to rehabilitate a social centre with the objective of restoring it to a usable state; and (ii) to install a borehole, both for improving the well-being of the populations and to reduce HWC, as HWC remains a challenge for communities in MCC with carnivores such as hyenas and lions attacking livestock and elephants and birds destroying crops in the fields. It is the intention of the Project to work together with the communities in finding solutions to the conflicts and promoting land use arrangements that reduce contact between people and wild animals, as well as introduce tools such as mobile bomas that would protect livestock from attack by wild animals during the night. The project will also rehabilitate livestock handling facilities, such as dip tanks, and improve access to water as part of a strategy to improve small stock and cattle production in MCC (see Chapter IX).

