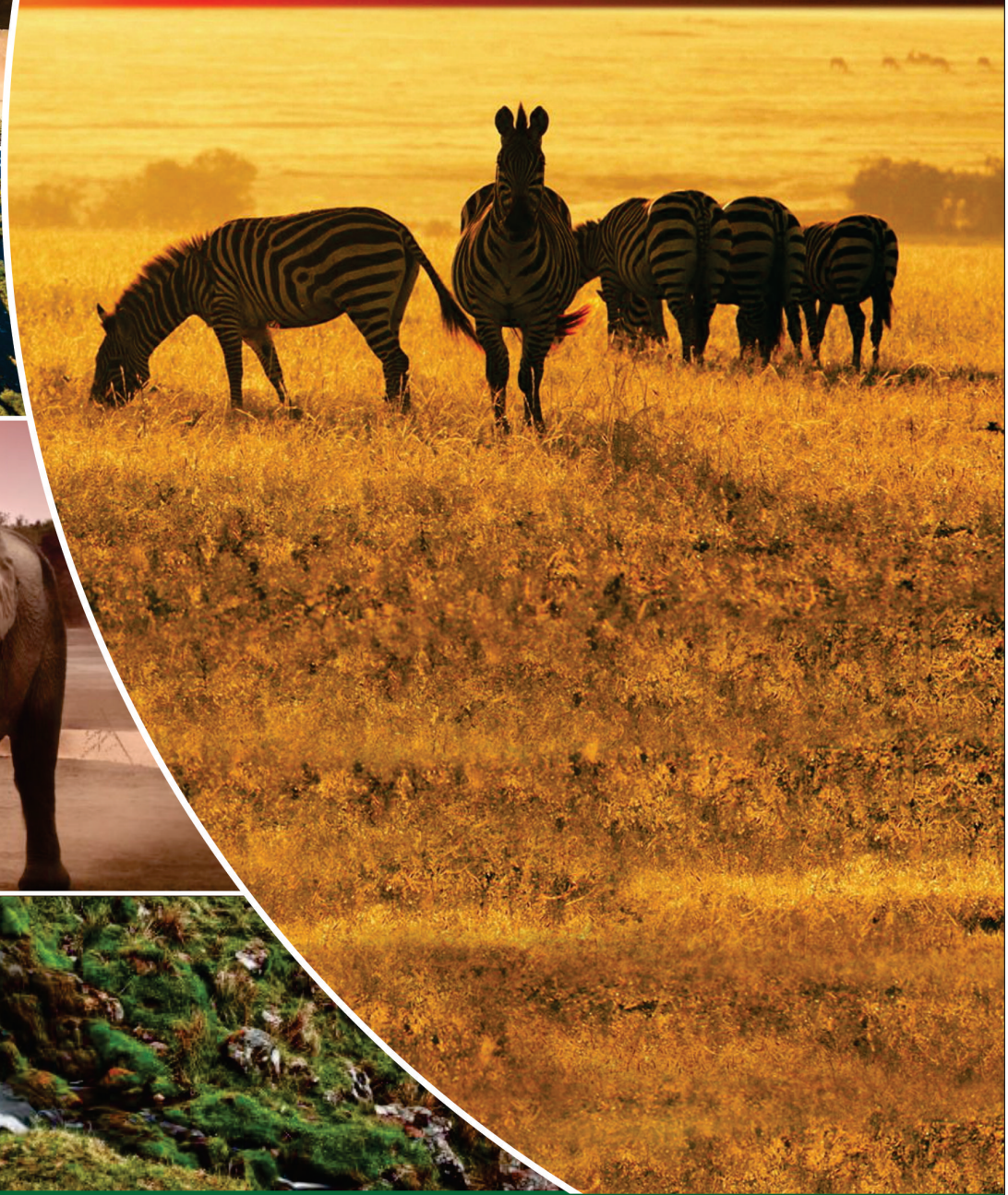
Government of Zimbabwe

Zimbabwe's Sixth National Report to the Convention on Biodiversity



MINISTRY OF ENVIRONMENT, TOURISM AND HOSPITALITY INDUSTRY

Zimbabwe's Sixth National Report to the Convention on Biodiversity

MINISTRY OF ENVIRONMENT,
TOURISM AND HOSPITALITY INDUSTRY
REPUBLIC OF ZIMBABWE

UN environment
United Nations
Environment Programme

Foreword

Zimbabwe is rich in biodiversity and is globally renowned for its long history in conservation of wild flora and fauna. The protected areas network which covers approximately 27.2%of the country's land mass harbours most of the biodiversity. Biodiversity is an important base for Zimbabwe's economy and supports the livelihoods of the majority of its population. The policy framework and strategies that have been developed over the last decade acknowledge the importance of biodiversity conservation for sustainable development and biodiversity has been streamlined in all sectors. However, over the last few decades Zimbabwe's biodiversity has come under increasing pressure from a multitude of anthropgenically driven threats, including climate change and global warming, over-exploitation of natural resources, habitat loss and environmental degradation, pollution and invasive alien species.

Zimbabwe is party to the United Nations Convention on Biological Diversity (CBD), having signed and ratified the convention in June 1992 and November 1994 respectively. At the tenth ordinary meeting of the Conference of the Parties (COP 10) to the CBD, parties adopted the Strategic Plan for Biodiversity 2011-2020 which profiled 20 Aichi Biodiversity Targets (ABTs) to be achieved by 2020 at the global level. The Strategic Plan encouraged countries to develop national biodiversity strategies and action plans (NBASAPs), thereby setting national targets that reflect the country's own needs and priorities and for reference as a central policy-making tool for national biodiversity management. Zimbabwe developed its first NBSAP, which covered the period 2000-2010, in 1998. In2013, the NBSAP underwent a review process so as to align it with the Strategic Plan 2011-2020 and the ABTs. The second NBSAP (NBSAP2), which was adopted in 2014, had 18 national biodiversity targets and these have been guiding our country's conservation efforts since then.

Article 26 of the CBD requires parties to produce a national report every four years. This report is Zimbabwe's sixth National Report to the CBD and it presents measures that the country has taken to implement NBSAP2, their effectiveness, as well as their support and contribution, to the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals.

I thank the UN Environment for financial assistance and all the stakeholders who participated in the preparation of this sixth National Report.

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Honourable Nqobizitha Mangaliso Ndlovu MP

Acting Minister of Environment, Tourism and Hospitality Industry

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Acronyms

ABS	Access and Benefits Sharing
ABT	Aichi Biodiversity Target
ACP	African, Caribbean and Pacific group of states
AECF	Africa Enterprise Challenge Fund
AGRITEX	Agricultural Technical and Extension Services
CA	Conservation agriculture
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
CBD	Convention on Biological Diversity
CBO	Community-based organisations
CBWM	Community Based Wildlife Management
CHM	Clearing house mechanism
CIMMYT	International Maize and Wheat Improvement Centre
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CMS	Convention on the Conservation of Migratory Species of Wild Animals
COSTIS	Consortium on Science, Technology and Innovation for the South
CTDO	Community Technology Development Organization
CWC	CAMPFIRE Wildlife Conservancy
DLDD	Desertification, land degradation and drought
DRM	Disaster risk management
DRSS	Department of Research and Specialists Services
EIA	Environmental impact assessment
EMA	Environmental Management Agency
EPI	Environmental Performance Index
EU	European Union
FAO	Food and Agriculture Organization
Faostat	FAO Statistical Databases
GBIF	Global Biodiversity Information Facility
GDI	Gender Development Index
GEF	Global Environment Facility
GTI	Global Taxonomy Initiative
HDI	Human Development Index
HSBC	Hwange-Sanyati Biological Corridor
HWC	Human wildlife conflict
ICCAs	Indigenous and community conservation areas
ICRISAT Tropics	International Crops Research Institute for the Semi-Arid
IKS	Indigenous knowledge systems
INFORM	Index for Risk Management
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IUCN	International Union for Conservation of Nature

LDN	Land degradation neutrality
LEAP	Local Environmental Action Plan
MAB	Man and Biosphere Programme
METHI	Ministry of Environment, Tourism and Hospitality Industry
MPI	Multidimensional Poverty Index
NBSAP	National Biodiversity Strategy and Action Plan
NDC	Nationally Determined Contribution
NEPAD	New Partnership for Africa's Development
NGO	Non-governmental organization
OECD	Organisation for Economic Co-operation and Development
REA	Rural Electrification Agency
REDD	Reducing Emissions and Decreasing Deforestation
REF	Rural Electrification Fund
SAA	Sustainable Afforestation Association
SADC	Southern African Development Community
SDGs	Sustainable Development Goals
SFM	Sustainable Forest Management
SIRDC	Scientific and Industrial Research and Development Centre
TFCAs	Transfrontier conservation areas
TIMB	Tobacco Industry and Marketing Board
TSP	Transitional Stabilisation Programme reforms agenda
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNSD	United Nations Statistics Division
WEZ	Wildlife and Environment Zimbabwe
WHO	World Health Organization
ZAS	Zimbabwe Agricultural Society
ZERA	Zimbabwe Energy Regulatory Authority
ZERO	Zimbabwe Environmental Research Organization
ZESA	Zimbabwe Electricity Supply Authority
ZimAsset	Zimbabwe Agenda for Sustainable Social and Economic Transformation
ZIMSTAT	Zimbabwe National Statistics Agency
ZINGSA	Zimbabwe National Geospatial and Space Agency
ZINWA	Zimbabwe National Water Authority
ZPWMA	Zimbabwe Parks and Wildlife Management Authority
ZRBF	Zimbabwe Resilience Building Fund
ZUNDAF	Zimbabwe United Nations Development Assistance Framework

Executive summary

Zimbabwe is home to a rich variety of flora and fauna, the majority of which occur within the protected areas network, which covers approximately 27.2% of the country's land mass. Historically, the country is renowned for its biodiversity protection, conservation and sustainable utilization. It is among a few countries in sub-Saharan Africa with rich populations of the African elephant (*Loxodonta africana*), lion (*Panthera leo*), leopard (*Panthera pardus*), and Cape buffalo (*Syncerus caffer*), as well as a steadily increasing rhino population. Over the last few decades, however, biodiversity in Zimbabwe has come under increasing pressure from a multitude of man-made threats, including climate change and global warming, over-exploitation of natural resources, habitat loss and environmental degradation, pollution and invasive alien species.

Zimbabwe signed the Convention on Biological Diversity (CBD) in 1992 and ratified it in 1994. At the tenth meeting of the Conference of the Parties to the CBD held in Nagoya, Aichi Prefecture, Japan, in October 2010, the parties adopted the Strategic Plan for Biodiversity 2011-2020 with the primary aim of halting biodiversity loss. The strategic plan has 20 Aichi Biodiversity Targets (ABTs) to be achieved globally by 2020. The parties were encouraged to establish national targets that contribute to the global targets through their national biodiversity strategies and action plans (NBSAPs). Zimbabwe developed its first NBSAP in 1998, which was reviewed and aligned with the strategic plan and the global ABTs to produce NBSAP2. This report presents the measures that the country has taken to implement NBSAP2, their effectiveness and their support and contribution to the implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals.

Zimbabwe's national biodiversity targets and implementation strategies

Zimbabwe's NBSAP2 was adopted in February 2016 and has 18 national biodiversity targets. In order to address the key biodiversity challenges in the country, NBSAP2 adopted the five ABT strategic goals[1] as its five strategic objectives:

- Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
- Reduce the direct pressures on biodiversity and promote sustainable use
- Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
- Enhance the benefits to all from biodiversity and ecosystem services
- Enhance implementation through participatory planning, knowledge management and capacity building

Some of the implementation strategies adopted for the five strategic objectives and 18 targets were:

- Develop and implement efficacious communication, education and awareness approaches
- Mainstream biodiversity in all sectors and including biodiversity in national accounting and reporting systems; enhancing institutional and human resources capacity
- Promote sustainable land use
- Adopt renewable energy and energy-saving alternatives and integrated ecosystem management
- Enhance and incorporate private, public and community participation
- Gender mainstreaming

Implementation, effectiveness, obstacles and scientific and technical needs for achieving the national targets

The policy and legal framework of Zimbabwe is supportive of the implementation of environmental protection and biodiversity conservation measures. But the effective implementation of most of the measures that were adopted in NBSAP2 has been hampered largely by insufficient funding and limited institutional and human resources. Furthermore, collaboration and coordination among the various institutions and organizations in the sector have been constrained. Adequate financial support and reinforcement of institutional and human resources capacities are essential requirements for achieving the national targets.

Zimbabwe's progress towards the national biodiversity targets and contribution to the achievement of the global ABTs and SDGs

Although constrained by inadequate financing and limited institutional and human capacity, various measures and activities for environmental protection and biodiversity conservation have been promoted and carried out across Zimbabwe. This has involved government agencies and departments, universities and other institutions of higher education, NGOs, private organizations, local communities and regional and international stakeholders. There has been notable progress towards some of the national biodiversity targets. For example, a broad range of biodiversity awareness activities using a variety of communication methods have been supported and implemented, and although the number of veld fires has increased, there has been a decrease in area burnt per year. Land area under organic farming has been on the increase and key species for promoting organic farming and helping to sustain biodiversity have been identified. Although there has been progress on most of the national targets, it has been insufficient.

Some of the country's contributions towards the achievement of the global ABTs have also been notable. Although encumbered with severe economic

[1] See Appendix 1

challenges for nearly two decades, Zimbabwe has continued to effectively manage its protected areas network, which covers about 27.2% of its land mass, and is greater than the proposed global Aichi Biodiversity Target of 17% for terrestrial and inland water areas (see ABT 17).[2]

A number of globally threatened species, notably the African elephant, lion, leopard and rhino, continue to receive protection, resulting in either stable or increasing populations, thus answering and contributing towards ABT 12. A number of programmes have been implemented that have enhanced the capacity of indigenous small-scale farmers in conserving local plant varieties and animal breeds, thus protecting the genetic diversity of cultivated plant and farmed and domesticated animals (see ABT 13).

The implementation of NBSAP2 is also contributing to the Sustainable Development Goals (SDGs). For example, the numerous and diverse awareness and educational programmes on biodiversity values and measures that can be used for conservation and sustainable utilization (Target 1) are contributing to SDG 4 (education), specifically to education for sustainable development (SDG 4.7), as well as to SDG 12 (consumption) on awareness of sustainable development (SDG 12.8). Target 2 is aiding the decoupling of growth from environmental degradation, promoting sustainable industrialization and the enhancement of policy coherence for sustainable development.

The implementation of measures to reduce the rate of loss of natural habitats by at least 50% (Target 3), such as the promotion of renewable energy, includes, among its beneficial contributions: increasing access to reliable and renewable energy (SDG 7.1 and 7.2); enhancing sustainable management of natural resources (SDG 12.2); strengthening resilience and adaptation to disasters (SDG 13.1); ensuring the conservation, restoration and sustainable use of ecosystems and services (SDG 15.1); and reducing habitat degradation, halting biodiversity loss and preventing extinctions (SDG 15.9). Generally, the broad range of programmes and activities that are being implemented across the country and are congruent with NBSAP2 are together contributing towards the 17 SDGs.

[2] Ibid.

SECTION I: Information on targets being pursued at the national level

1. INTRODUCTION

1.1 Location and general characteristics

Zimbabwe is a landlocked country in southern Africa with a total surface area of 391,000 km^2. It lies between latitudes 15° and 23° south of the Equator and longitudes 25° and 34° east of the Greenwich Meridian. It borders Mozambique, South Africa, Botswana and Zambia to the east, south, west and north-west respectively (Figure 1.1). The Zambezi River to the north and the Limpopo River to the south form Zimbabwe's borders with Zambia and South Africa respectively.

Most of Zimbabwe is elevated on a central plateau (the Highveld) which stretches from the south-west to the north-west at between 1,200 and 1,600 m. The eastern portion of the country is mountainous, with Mount Nyangani at 2,592 metres the highest point. The Lowveld, which is below 900 m, makes up approximately 20% of the country. The Zambezi and Limpopo river valleys in the north and south have the lowest altitudes of about 500 m. About 75% of the country is semi-arid, with low and sporadic rainfall, which makes it prone to unpredictable droughts.[1]

Zimbabwe's climate is markedly varied by altitude, and although the country lies within the tropics, the Highveld and Eastern Highlands have a subtropical to temperate climate. Mean annual rainfall varies from as low as 300 mm in the Limpopo Valley to a high of 3,000 mm in the eastern mountainous areas. The average for the whole country is 675 mm.[2, 3] The rainy season starts in November and tails off in March. There is wide spatial and temporal variation in rainfall. Its reliability increases with altitude and from south to north. High coefficients of rainfall variability (>40%) have been recorded in areas south of Bulawayo, while those in the Highveld and Eastern Highlands have recorded <20%.[2] The mean annual temperature ranges from 18-19 ºC at about 1,400 m above sea level and averages 23 ºC at 450 m in the Limpopo Valley. Mean

Figure 1.1 Map of Zimbabwe

Source: www.nationsonline.org/, accessed 3 December 2018

maximum temperatures are low in the winter months (June-July) and highest in October.[2, 3]

The 2017 Inter-Censal Demographic Survey (ICDS) estimated the population of Zimbabwe at 13,572,560 with males and females comprising 48% and 52% respectively.[4] The population is relatively young: 40% are younger than 15 years and about 6% are 65 years and older. Sixty-eight percent of the population lives in rural areas.[4] Administratively, the country is divided into eight provinces and two cities, Harare and Bulawayo, which have provincial status.

Zimbabwe's economy and the well-being of its population are heavily dependent on the exploitation of its natural resources, with agriculture and mining being the dominant sectors. In 2010, the two sectors accounted for about 30% of the country's GDP. Before 2012, agriculture made the single biggest contribution to GDP, total exports and employment creation, and at its peak it contributed over 30% to GDP, while accounting for between 60% and 70% of employment.[5] The mining sector has since 2009 being growing by double digits, and between 2009 and 2012 it grew faster than all other sectors.[6] According to the Chamber of Mines, the direct contribution of mining to GDP increased from 9% in 2016 to 12% in 2017. Thus, not only economic performance is driven by the performance of sectors that are based on the exploitation of the natural resource base, but the future economic development of Zimbabwe also depends to a large extent, directly and indirectly, on the sustainable management of its natural resources.

The poverty headcount ratio at $1.90 a day (i.e. the percentage of the population living on less than $1.90 a day at 2011 international prices) stands at 21.5%. Income poverty, as measured by the proportion of people whose income is less than the total consumption poverty line (TCPL),[7] has remained high, generalized and almost constant at above 70% since 1995.[8] Very high proportions – 92% of the extremely poor population and 91% of the extremely poor households – reside in rural areas. The proportions of the poor population and households in rural areas are also high at 80% and 78% respectively.

Most of the country's poor have limited livelihood opportunities outside subsistence farming. Thus, with 68% of the country's population and greater prevalence of poverty, the rural population has a greater need for direct exploitation of natural resources.

The country has experienced serious economic challenges and hardships in the last two decades, and so the cutting of trees for firewood and charcoal, timber and wildlife poaching, clearing of forests for farming and other means of resource extraction have become important activities for livelihood support, especially among the poor. The unsustainable use of natural resources is endangering sustainable economic development of the country.

1.2 Zimbabwe's biodiversity and protected area network

1.2.1 Biodiversity

Zimbabwe is rich in biodiversity and globally renowned for its long history of conserving of wild flora and fauna, which includes 6,398 native or naturalized plant species,[9] 627 bird species,[10] 270 mammals, 197 reptile species,[11] 120 amphibian species and 145 fish species.[12]

According to Mapaura,[13] 232 plant species are endemic or near-endemic. The area with the greatest number of endemic species is the Chimanimani mountains with no fewer than 70 endemic or near-endemic taxa. A second important area is the Great Dyke. In addition, there are many endemics in the more broadly defined Eastern Highlands, the central watershed, north-west Zimbabwe and the Limpopo escarpment. Overall, 54 plant species present in Zimbabwe are listed as threatened with extinction on the IUCN Red List of Threatened Species, with 16 being endangered and 38 vulnerable.[14] Among the birds, 499 are land birds and 128 are water birds, and 189 are migratory. Twenty bird species that have been recorded in the country are globally threatened with extinction, and of these four are critically endangered, five are endangered and 11 vulnerable.[15]

The mammalian fauna of Zimbabwe is usually dominated by Africa's 'Big Five' – lion (*Panthera leo*), leopard (*Panthera pardus*), white and black rhinoceros (*Ceratotherium simum* and *Diceros bicornis*), elephant (*Loxodonta africana*) and Cape buffalo (*Syncerus caffer*) – but there are less known and less flamboyant mammals, such as the four-toed elephant shrew (*Petrodromus tetradactylus*), bush hyrax (*Heterohyrax brucei*), Arend's golden mole (*Carpitalpa arendsi*) and spotted-necked otter (*Hydrictis maculicollis*). Eleven of the mammalian species, including lion, leopard, rhinoceros and elephant, are listed as globally threatened with extinction.[16]

There has been comparatively little focus on the status of reptiles and amphibians in Zimbabwe, but much attention is given to the Nile crocodile (*Crocodylus niloticus*) because of its commercial importance. Globally threatened with extinction among the reptiles are five species – the Zambezi flapshell turtle (*Cycloderma frenatum*), pancake tortoise (*Malacochersus tornieri)*, Marshall's pygmy chameleon (*Rhampholeon marshalli*), dwarf wolf snake (*Lycophidion nanus*) and emperor flat lizard (*Platysaurus imperator*) – and among the amphibians, seven species – the Chimanimani stream frog (*Strongylopus rhodesianus*), Nyanga river frog (*Amietia inyangae*), Chirinda toad (*Mertensophryne anotis*), Inyanga toad (*Vandijkophrynus inyangae*), cave squeaker (*Arthroleptis troglodytes*), forest rain frog (*Probreviceps rhodesianus*), and the Nyanga long reed frog (*Hyperolius inyangae*).

A total of 157 fish species have been reported from Zimbabwe and of these, 17 have been introduced. Three fish species, the three-spotted tilapia (*Oreochromis andersonii*), longfin tilapia (*Oreochromis macrochir*), and Kariba tilapia (*Oreochromis mortimeri*) are threatened with extinction; the latter is critically endangered and the other two are vulnerable.[17] A variety of other organisms such as fungi, invertebrates (insects, worms and crustaceans), algae, bacteria and viruses tend to receive little attention in biodiversity discourses in Zimbabwe.

1.2.2 Zimbabwe's protected areas network

About 106,837 km^2 (27.2%) of Zimbabwe's landmass falls under protected areas, as shown in Figure 1.2, comprising 232 sites of which 222 are categorized in 12 national designations and 10 in three international designations (Table 1.1). National parks, wildlife estates and gazetted forests comprise 14.9% of the country's protected area network, conservancies 1.9% and CAMPFIRE areas 11.2%.

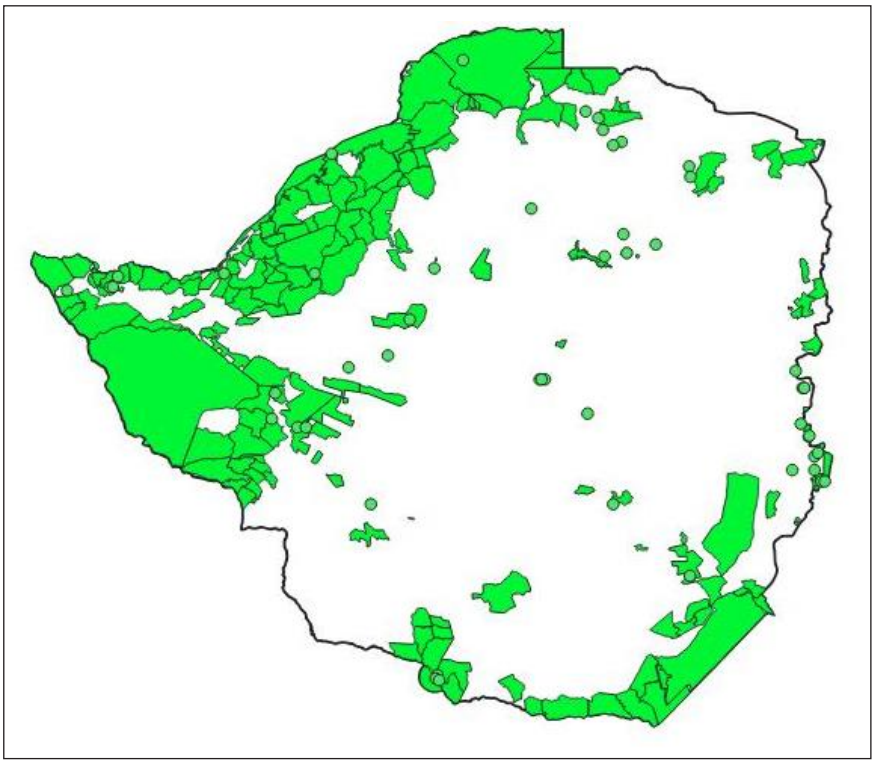
1.2.2.1 Botanical gardens

Botanical gardens are areas where indigenous and exotic plant species are protected and propagated. Zimbabwe has three – the National Botanical Gardens, which houses the National Herbarium of Zimbabwe, in Harare; Ewanrrig, 18 km north-east of Harare; and Vumba Botanical Gardens in the Eastern Highlands, approximately 32 km from Mutare (Figure 1.3c) . The National Botanical Gardens has over 900 tree and shrub species of Zimbabwe as well as several trees from across the globe. It is a centre for research and information on indigenous plants of Zimbabwe and promotion of their conservation and sustainable use. The National Herbarium has about 500,000 plant specimens and is the main reference centre for research on

Table 1.1 Protected area profile for Zimbabwe[18]

National designations	
Botanical gardens	3
Botanical reserves	14
National monument	1
National parks	11
Nature reserve	1
Protected forests	6
Recreation parks	9
Recreational parks	3
Safari areas	16
Sanctuaries	11
State forests	43
Wildlife management areas area	104
International designations	
Ramsar sites, wetlands of international importance	7
UNESCO-MAB biosphere reserve	1
World Heritage Sites (natural or mixed)	2

Figure 1.2 Protected areas network of Zimbabwe



Source: ZPWMA

identifying and naming plants of the *Flora Zambesiaca* region, which comprises Zimbabwe, Zambia, Malawi, Mozambique and Botswana. Ewanrrig has one of the largest collections of indigenous and exotic aloes, cycads and succulent plants in the world. Vumba Botanical Gardens is richly endowed with indigenous orchids and ferns and other flora – proteas, fuchsias, cycads, tea bushes, aloes and camellia – as well as fauna, including monkeys, blue duiker, bushbucks and the dwarf chameleon, which is endemic to the Eastern Highlands.

1.2.2.2 Botanical reserves

Zimbabwe has 14 botanical reserves that specialize in protection and propagation of indigenous and exotic plant species (Figure 1.3c). The best known of these are the Bunga, Haroni, Rusitu and Vumba forests, all of which are in the Eastern Highlands. Bunga Forest is a unique dense indigenous rain forest. Haroni and Rusitu forests are virtually contiguous, located along the international boundary with Mozambique south of Chimanimani National Park. They are both part of the important bird area (IBA) network of the country and were initially designated to protect one of the richest ecological complexes in Zimbabwe.

1.2.2.3 National monuments

Great Zimbabwe National Monument, which lies about 30 km from Masvingo, was built between 1100 and 1450 AD and covers nearly 800 ha. The monument is sub-Saharan Africa's largest and most important stone ruins. This culturally important structure bears unique testimony to the lost civilization of the Shona people between the 11th and 15th centuries.

1.2.2.4 National parks

Like many countries in Africa, national parks have been the cornerstone of biodiversity conservation in Zimbabwe. The country has 11 national parks – Chimanimani, Chizarira, Gonarezhou, Hwange, Kazuma Pan, Mana Pools, Matobo, Matusadona, Nyanga, Victoria Falls and Zambezi (Figure 1.3a) – which are managed and run by the Zimbabwe Parks and Wildlife Management Authority (ZPWMA). The parks were established to preserve the pristine and original nature of the areas, and no hunting or extractive use is allowed there. Most of the national parks are in agro-ecological regions four and five which are marginal to agricultural production.

1.2.2.5 Nature reserves

Cecil Kop, a 1,500 ha site on the outskirts of the city of Mutare, is categorized as a nature reserve. Established in 1977, it is managed by the Manicaland branch of Wildlife and Environment Zimbabwe to provide educational and recreational facilities for local citizens to view Zimbabwe's wildlife under natural conditions.[19] Although Cecil Kop is the only listed nature reserve in Zimbabwe on the World Database of Protected Areas, there are other areas that provide educational and recreational amenities for wildlife and nature conservation. They include Antelope Park Nature Reserve,[20] Greystone Park Dam, Mukuvisi Woodlands,[21] Haka Camp Game Park and Wild Is Life.[22]

Figure 1.3a National parks of Zimbabwe

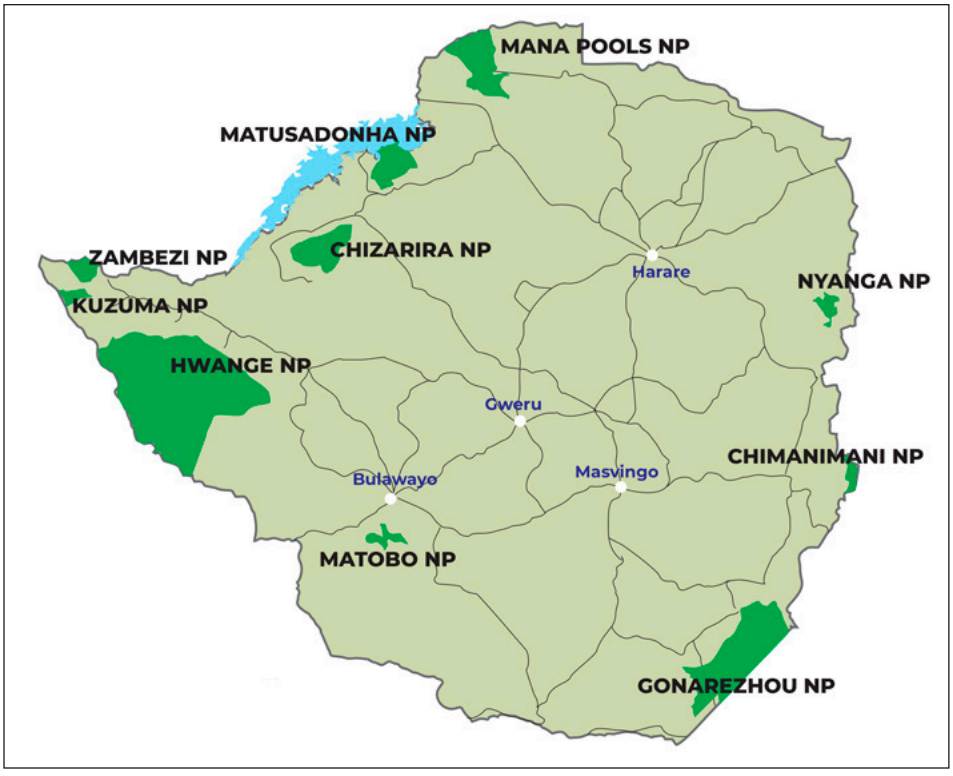


Figure 1.3b Safari areas, sanctuaries and recreational parks of Zimbabwe

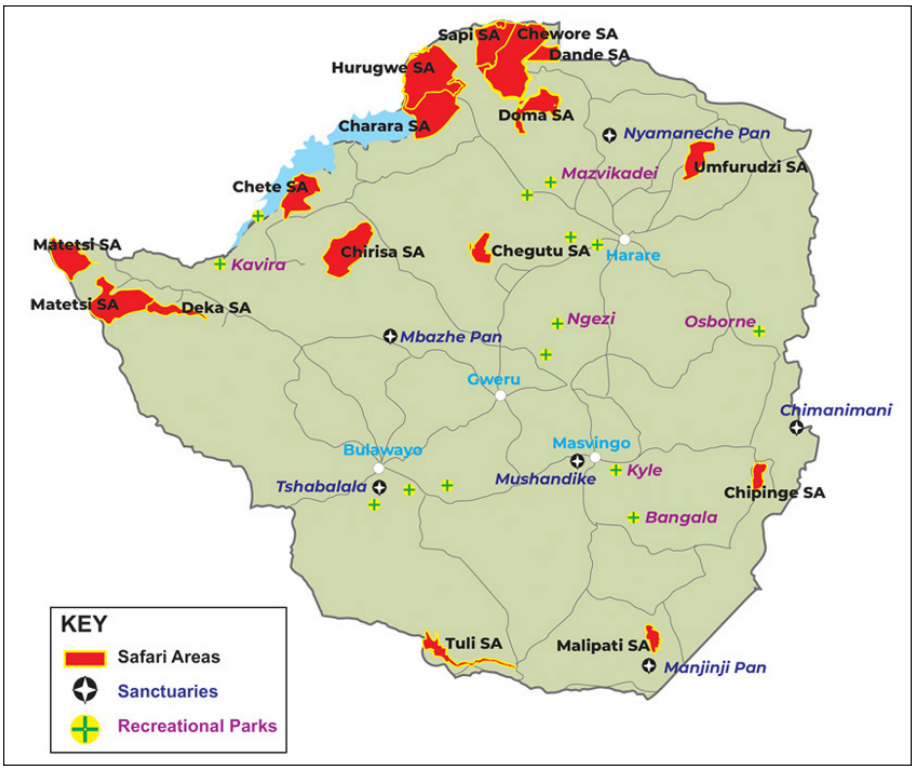
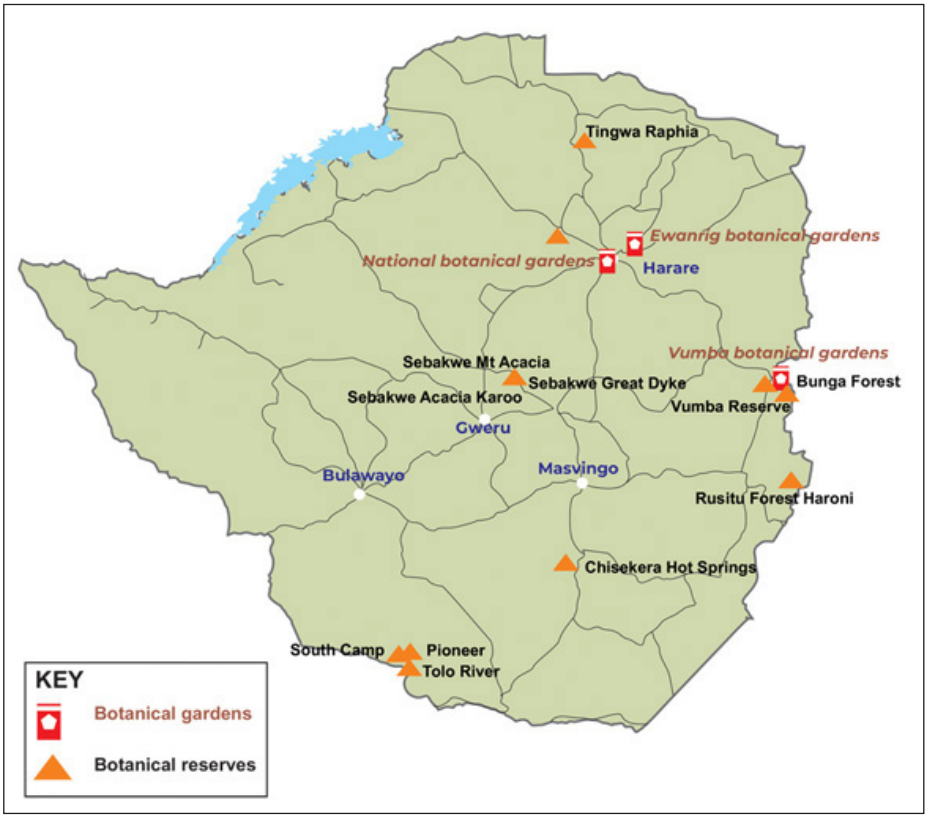


Figure 1.3c Botanical parks and botanical reserves of Zimbabwe



1.2.2.6 Forests

About 35% of Zimbabwe's total land area is covered by forests. Forty-nine forests fall under the protected areas network, and of these 22 have been gazetted for the protection of indigenous forests (Figure 1.4). These forests are managed by the Forestry Commission of Zimbabwe. Nineteen of the gazetted forests are in western Zimbabwe, in the Midlands and Matebeleland North provinces, on Kalahari sands which are ecologically fragile soils and can easily be turned into deserts through indiscriminate cutting of trees. They are home to commercially valuable indigenous timber

species such as teak (*Baikea plurijuga*), mukwa (*Pterocarpus angolensis*), wooden banana (*Entandrophragma caudatum*), *mchibi* (*Guibourtia coleosperma*), leadwood (*Combretum imberbe*) and white seringa (*Kirkia acuminata*).[23] The other three gazetted forests – Chirinda, Chisengu and Nyangui – are in Manicaland province. Chirinda Forest represents the southern end of moist forest distribution in Zimbabwe and is the best-preserved example of medium-altitude moist forest.[24]

1.2.2.7 Recreation and recreational parks

Recreation parks in Zimbabwe are typically created around large dams and national lakes. They include Manjirenji, Sebakwe, Lake Kariba, Kyle, Umzingwane, Lake Chivero, Bangala, Darwendale and Ngezi recreation parks (Figure 1.3b). They are managed by the ZPWMA, which also manages aquatic life in dams and monitors the impact of recreational activities on the environment. The three recreational parks are the Chinhoyi caves, Kavira hot springs and Mupfure.

1.2.2.8 Safari areas

Safari areas (Figure 1.3b) are part of the parks and wildlife estates in which controlled hunting is permitted and managed through a comprehensive quota system that allows for sustainable and non-destructive hunting and ensures that there are minimal conflicts with other resource users.

1.2.2.9 Sanctuaries

Sanctuaries are reservoirs of animal species that are threatened with extinction and therefore require safe breeding habitats. They include Mushandike, Nyamanechi, Bubiana, Malilangwe, Save and Chiredzi River conservancies (Figure 1.3b).

1.2.2.10 Wildlife management areas

The 104 wildlife management areas in Zimbabwe are largely associated with the CAMPFIRE programme. CAMPFIRE areas comprise approximately 11.2% of the protected areas network of Zimbabwe. The programme was introduced by the ZPWMA the 1980s to maximize the livelihood options for communities living in areas rich in biodiversity and where crop production has limited potential. CAMPFIRE projects involve communities in the co-management of wildlife in communal areas and were the first community-based wildlife conservation initiatives to approach wildlife as a renewable and profitable resource.

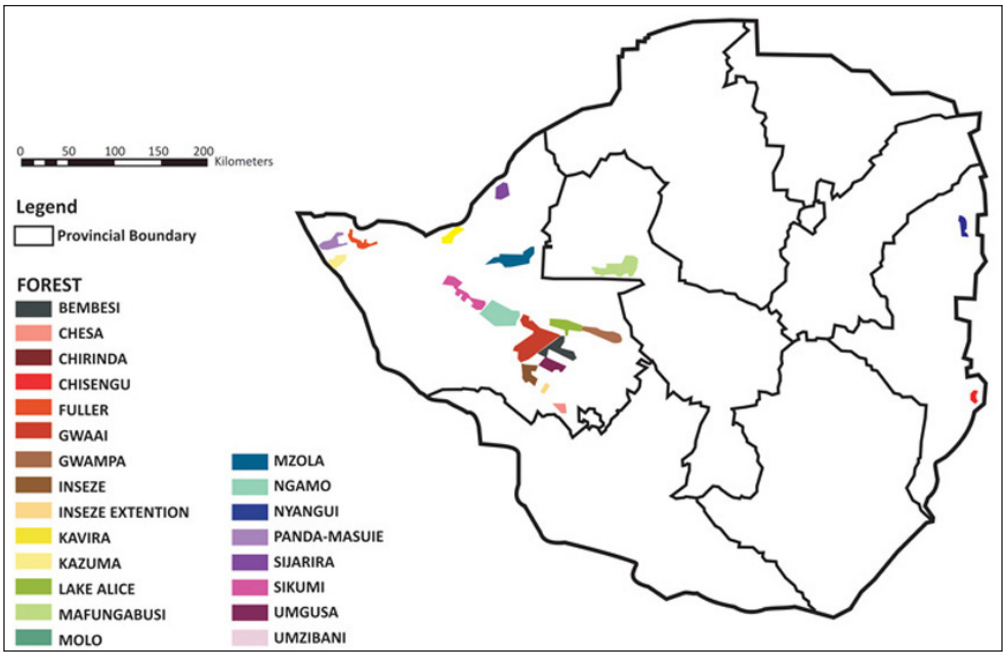
1.2.2.11 Ramsar sites, wetlands of international importance

Zimbabwe is a signatory to the Ramsar Convention, an intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources. The country has designated seven areas as Ramsar sites – Mana Pools, Cleveland Dam, Driefontein grasslands, Monavale wetland, Lakes Chivero and Manyame, Chinhoyi Caves Recreational Park and Victoria Falls National Park (Figure 1.5). These sites, which cover over 450,000 ha, are not only crucial for the sustenance of communities and wildlife, but are also important destinations for tourism and recreation.[25]

1.2.2.12 UNESCO-MAB bosphere reserve

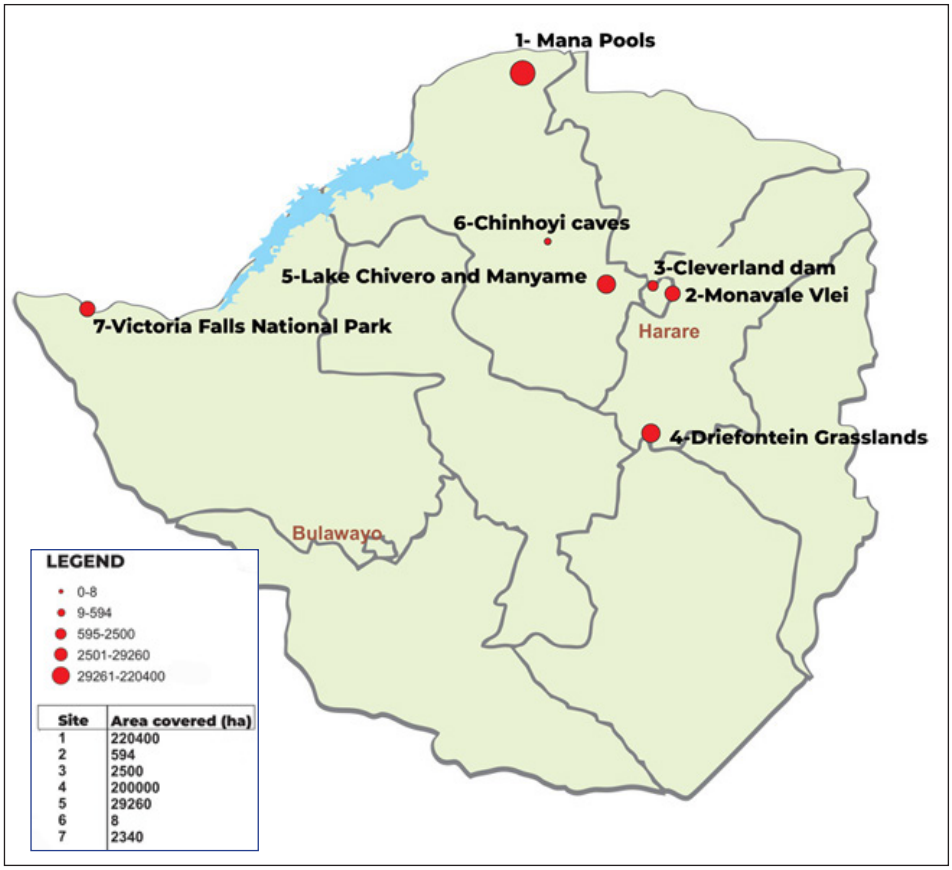
The Middle Zambezi biosphere reserve was established in 2010. Located along the Zambezi River, it covers 2,879,300 ha and consists of riverine and terrestrial ecosystems unique to the subcontinent. The flora

Figure 1.4 The 22 forests gazetted for the protection of indigenous forests in Zimbabwe



Source: Forestry Commission

Figure 1.5 Zimbabwe's Ramsar sites



Site	Area covered (ha)
1	220400
2	594
3	2500
4	200000
5	29260
6	8
7	2340

consists of *colophospermum*, *combretum* and *terminalia* woodland and Zambezi riparian forest. At Mana Pools, the biosphere comprises the only floodplain ecosystem left in the Middle Zambezi.[26] The threatened animal species found in the valley are the painted wild dog (*Lycaon pictus*) and the nyala (*Tragelaphus angasii*).

1.2.2.13 World heritage sites (natural or mixed)

The two world heritage sites in Zimbabwe are Mosi-oa-Tunya (Victoria Falls), which is shared with Zambia, and Mana Pools National Park, which includes and Sapi and Chewore safari areas. Mana Pools covers 6,766 km² and is part of a transboundary system that includes wildlife conservation sites in Zambia.

1.3 Threats to biodiversity in Zimbabwe

In Zimbabwe, the threats to biodiversity include agricultural expansion, infrastructural development and encroachment by settlements, over-reliance on wood energy, illegal wildlife trade, pollution, invasive alien species and climate change. The deforestation rate is currently about 330,000 ha per year and is driven largely by agricultural expansion and reliance on wood energy. Cotton farming, which is widely practised in the Middle Zambezi Valley, has been shown to be one of the most polluting forms of agriculture in the world. It drives major land use change and loss of biodiversity,[27] and is harmful to freshwater resources.[28] Pollution of terrestrial and aquatic habitats from industrial, agricultural and domestic activities and the prevalence of invasive alien species are causing increasing harm to biodiversity across the country. Gratwicke et al showed that pollution has caused significant harm to the abundance and species richness of fish in the upper Manyame catchment in and around Harare. [29]

More than 150 non-native species have been identified, including 30 that are listed among the 100 of the world's worst invasive alien species. *Lantana camara*, which is invasive in Zimbabwe,[30] has been shown to harm native vegetation structure and composition in Gonarezhou National Park,[31] while another non-native plant, black wattle (*Acacia mearnsii*), is a serious threat to grassland diversity and avifauna in and around Nyanga National Park.[32] Among the other non-native species that have been shown to be harmful to biodiversity in Zimbabwe are *Oreochromis nilotucus* (Nile tilapia),[33] patula or spreading-leaved pine (*Pinus patula*)[34] and water hyacinth (*Eicchornia crassipes*).

Global climate models indicate that most of southern Africa, including Zimbabwe, will experience temperatures 2 ºC to 4 ºC higher than the 1961-1990 baseline in the coming decades, while the onset of rains will be less dependable and droughts and floods will be more frequent and severe. Among the animals that are already threatened by climate change in Zimbabwe are African wild dog (*Lycaon pictus*).[35] Chapungu and Nhamo have shown that climate change is associated with a decrease in vegetation species richness the in Mutirikwi sub-catchment.[36]

1.4 Zimbabwe's response to biodiversity threats

Zimbabwe has a rich history of biodiversity conservation. It has established an extensive protected areas network and enacted legislation for strict conservation and preservation in some areas and sustainable utilization in others. Its protected areas network, which covers about 27.2% of its land area, puts Zimbabwe among the top 50 countries globally with respect to protected area coverage.[37] The country has a variety of ongoing programmes and activities for biodiversity conservation. They include anti-poaching activities, education and research and community conservation.

At a regional level, Zimbabwe is party to the SADC Protocol on Wildlife Conservation and Law Enforcement, which aims at establishing a common framework for conservation and sustainable use of wildlife in the region. The protocol encourages member states to agree to policy, administrative and legal measures for promoting conservation and sustainable wildlife practices in their jurisdictions and to collaborate on common approaches for achieving the goals of international agreements on wildlife. The protocol also urges member states to harmonize legal instruments for wildlife, establish management programmes for wildlife and create a regional database of wildlife status and management.[38] Zimbabwe signed up to and established with its neighbours two transfrontier conservation areas (TFCAs); two others are emerging TFCAs with memoranda of understanding signed; another two are at the conceptual stage.

Globally, Zimbabwe is party to the Convention on Biological Diversity (CBD), having signed the convention in June 1992 and ratified it in November 1994. It is party to other global multilateral environmental agreements – the Cartagena Protocol on Biosafety (ratification May 2005); Nagoya Protocol on Access and Benefit Sharing (accession November 2017); Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES, accession 1981); Convention on the Conservation of Migratory Species of Wild Animals (a party since 2012); International Treaty on Plant Genetic Resources for Food and Agriculture (ratification 2005); International Plant Protection Convention (2002); Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (accession March 2012); Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (accession March 2012); United Nations Framework Convention on Climate Change (ratification 1992); and UN Convention to Combat Desertification (ratification September 1997).

To address global biodiversity loss, the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD) adopted a strategic plan in which the parties committed themselves to the 2010 Biodiversity Commitments. The commitments stressed the implementation of the CBD's objectives in a more effective and coherent way, with the aim of significantly reducing biodiversity loss globally, regionally and nationally by 2010 as a contribution to poverty alleviation and to the benefit of all life on earth. The targets associated with the 2010 commitments were not achieved at a level that addressed the global pressures, resulting in continued loss in biodiversity. At its tenth meeting, the COP adopted a Strategic Plan for Biodiversity 2011-2020, which included 20 Aichi Biodiversity Targets (ABTs) to be achieved by 2020 at the global level. The Strategic Plan for Biodiversity 2011-2020 also encouraged parties to establish additional national or regional targets that contribute to these global targets, but more accurately reflect a country's needs and priorities.

The Strategic Plan for Biodiversity 2011-2020 requires that countries prepare national biodiversity strategies and action plans (NBSAPs) for implementing the strategic plan and achieving the ABTs and as a central policy-making tool for national biodiversity management. It also encourages countries to ensure that the NBSAPs and the principles of conservation, sustainable use and fair and equitable use are integrated into the planning and activities of those sectors whose activities have positive and negative impacts on biodiversity. Zimbabwe, with other parties to the CBD, has developed national targets, strategies and actions to achieve the strategic plan. This is Zimbabwe's sixth national report to the CBD, and it reports on the progress that the country is making towards its biodiversity targets.

1.5 Zimbabwe's National Biodiversity Strategy and Action Plan (NBSAP)

Zimbabwe developed its first NBSAP, which covered the period 2000-2010, in 1998. In 2013, the NBSAP underwent a review so as to align it with the UNCBD Strategic Plan 2011-2020 and the ABTs.[39] Its second NBSAP (or NBSAP2) was adopted in 2014, and its stated vision was "a Zimbabwe with resilient ecosystems and biodiversity values for social, political and economic development", while its mission was stated as being "to utilize traditional knowledge, research, technology, innovations and best practices to protect the environment, conserve and sustainably use biodiversity and ecosystems to benefit present and future generations".

In NBSAP2, Zimbabwe adopted 18 national biodiversity targets in line with the Strategic Plan for Biodiversity 2011-2020 and the ABTs. During its development, the main threats to biodiversity were identified and used to come up with 10 high-priority biodiversity issues. They were identified as:

- Land use and land use systems
- Biodiversity and business
- Coordination in policy implementation
- Mainstreaming biodiversity into planning processes
- Innovative biodiversity financing
- Alternative renewable energy solutions

- Baseline information for NBSAP 2 implementation, monitoring, evaluation and reporting
- Communication, education and awareness of biodiversity for all stakeholders
- Strategic environmental assessments and a stronger framework for environmental impact assessments for key sectors impacting biodiversity
- Integrated water management

In order to address the priority biodiversity issues, five strategic objectives were identified, after which biodiversity targets and actions developed for each objective. They objectives were:

- Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
- Reduce the direct pressures on biodiversity and promote sustainable use
- Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity
- Enhance the benefits to all from biodiversity and ecosystem services
- Enhance implementation through participatory planning, knowledge management and capacity building

The remaining portion of Section 1 of this report provides information about each national biodiversity target, the ABTs to which it is related and its relevance to Zimbabwe.

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Strategic objectives: National biodiversity targets in relation to Aichi Biodiversity Targets

Strategic Objective 1: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

Target	Strategies	Global ABTs related to target		Significance of target to Zimbabwe	Level of government to which target applies
		Wholly or partially	Indirect		
By 2020, at least 75% of the population is aware of the value of biodiversity and the steps they can take to conserve and use it sustainably	Develop and implement comprehensive communication, education and public awareness (CEPA) strategy on conservation and sustainable use of biodiversity	1	2, 4, 17, 18, 19	• A study was done on biodiversity mainstreaming as part of the process for developing NBSAP2 • Mainstreaming of biodiversity across government and society was identified as a priority area • Effective biodiversity mainstreaming would require the development and implementation of effective and coordinated CEPA approaches on biodiversity issues for all stakeholders	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils
By 2020, biodiversity is mainstreamed into all seven sectors (mining, agriculture, health, manufacturing, transport, energy and education) and incorporated into national accounting and reporting systems	• Develop biodiversity policy to be mainstreamed into all sectors and incorporated into the national accounting and reporting system • Use biodiversity and ecosystems services valuation tools to quantify the economic, social and ecological values	2, 3, 4	1	• In the study on biodiversity mainstreaming when NBSAP2 was being developed, the following sectors were identified as having high impact on biodiversity: mining, industry, transport, agriculture, energy and tourism • Key aspects identified for effective biodiversity mainstreaming included: - Economic valuation of biodiversity and ecosystems services for integration in national and sectoral planning, budgeting and decision making - Economic incentives to promote conservation and sustainable use of biodiversity	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils

Strategic Objective 2: Reduce the direct pressures on biodiversity and promote sustainable use

Target	Strategies	ABT related to target		Significance of target to Zimbabwe	Level of government to which target applies
		Wholly or partially	Indirect		
By 2020, reduce the rate of loss of natural habitats, including forests, by at least 50%	• Strengthen institutional capacity for implementation of biodiversity and ecosystems conservation • Promote sustainable land use • Promote and lobby for development of renewable energy and energy-saving alternatives • Adopt integrated ecosystems management • Prevent pollution of ecosystems	5	3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15	• Forest cover and diversity have been rapidly declining due to expansion of agriculture, unsustainable exploitation of fuelwood, infrastructural developments, uncontrolled fires, invasive alien species and climate change • 60% of Zimbabwe's wetlands fall within communal and resettlement areas and are prone to high levels of degradation largely due to unsustainable human activities such as overgrazing and cultivation and the impact of climate change	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils
By 2020, ecosystem-based approaches to aquatic resources management are being applied on Lake Kariba and other water bodies to avoid overfishing, enable the recovery of fish stocks and reduce loss of indigenous species	• Strengthen institutional capacity • Adopt integrated ecosystems management • Prevent pollution of ecosystems	6	5, 7, 11, 12, 13	• Zimbabwe's aquatic ecosystems are threatened by high pollution levels and the spread of invasive alien species such as water hyacinth (*Eichhornia crassipes*) and the Nile tilapia (*Oreochromis niloticus*) • Commercial fish catches of kapenta (*Limnothrissa miodon*) or Lake Tanganyika sardine in Lake Kariba have drastically decreased due to overfishing	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils

Strategic Objective 2 (continued)

Target	Strategies	ABT related to target		Significance of target to Zimbabwe	Level of government to which target applies
		Wholly or partially	Indirect		
By 2020, 60% of areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity and sustainable land use	• Strengthen institutional capacity • Promote sustainable land use • Promote and lobby for development of renewable energy and energy-saving alternatives • Adopt integrated ecosystems management • Prevent pollution of ecosystems	7	1, 5, 6, 8, 9, 10, 11, 13, 14	• The major direct drivers of ecosystems change and biodiversity loss in Zimbabwe have been accelerated urban housing construction, expansion in agriculture and mining, unsustainable exploitation of natural resources, deforestation, invasive alien species, climate change and high dependence on the natural capital for human development • Forest diversity has been declining due to expansion of agriculture, unsustainable exploitation of fuelwood, infrastructural developments, uncontrolled fires and invasive alien species • Tobacco farming has contributed to 15% of deforestation due to dependence by 90% of tobacco farmers on fuelwood for curing. • An increase in the population of newly resettled areas has resulted in accelerated clearance of forests and woodlands for cultivation	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils
By 2020, integrated pollution prevention and control strategies are in place to reduce detrimental effects to ecosystem function and biodiversity	• Strengthen institutional capacity • Promote sustainable land use • Adopt integrated ecosystems management • Prevent pollution of ecosystems	8	1, 2, 3, 4, 7, 14	• Zimbabwe's aquatic ecosystems are threatened by high pollution levels largely due to excessive use of fertilizer and discharge of industrial effluent and untreated sewage • Acid mine drainage due to alluvial mining has emerged as a major source of pollution of some river systems. • High levels of pollution have provided suitable conditions for the spread of aquatic invasive plant species	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils

Strategic Objective 2 (continued)

Target	Strategies	ABT related to target		Significance of target to Zimbabwe	Level of government to which target applies
		Wholly or partially	Indirect		
By 2020, the threats to biodiversity from Invasive alien species have been assessed, and measures put in place to control and manage their impact	• Strengthen institutional capacity • Adopt integrated ecosystems management	9	1, 12, 13, 19	Despite the widespread occurrence of invasive alien species in Zimbabwe, no comprehensive data on plant and animal invasive species are available	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils
By 2020, adaptation and mitigation strategies are implemented to reduce the impact of climate change on vulnerable ecosystems and communities	• Strengthen institutional capacity • Promote sustainable land use • Promote and lobby for development of renewable energy and energy-saving alternatives • Adopt integrated ecosystems management • Prevent pollution of ecosystems • Adopt disaster risk reduction approaches	10, 15	3, 4, 5, 6, 7, 11, 13, 14, 18	• The impacts of climate change in Zimbabwe are likely to be detrimental to some ecosystems and will affect the country's development and pose a serious risk to food security and adaptive capacity • The government regards climate change as one of the threats to the country and its people and believes that climate change has the potential to undermine many of the positive developments made in its meeting of the country's development goals	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils

Strategic Objective 3: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

Target	Strategies	ABT related to target		Significance of target to Zimbabwe	Level of government to which target applies
		Wholly or partially	Indirect		
By 2020, at least 28% of Zimbabwe's terrestrial and inland water under protection is maintained and conserved, and protected area connectivity enhanced through integrated resource management	• Use an adaptive ecosystems management approach such as trans-frontier conservation areas, which encourage private and public participation • Integrate the implementation of conventions such as the Ramsar convention and the UNFCCC	11	5, 6, 7, 12, 14	The major threats to ecosystems, species and genetic diversity in Zimbabwe are land use and land use changes and their associated drivers. To ensure that ecosystems, species and genetic diversity are safeguarded, it is necessary to strengthen the protection and conservation measures of protected areas in the country	National government
By 2020, the loss of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained	• Identify threatened species and institute mechanisms to protect them	12	5, 6, 13	Although a number of species in Zimbabwe are known to be vulnerable, endangered and critically endangered, the status of a number of them is unclear, and there is need to take measures to ensure no species are lost	National government
By 2020, develop and implement strategies to conserve and maintain cultivated, farmed and domesticated genetic resources and their wild relatives, including other socio-economically and culturally valuable species	• Use *ex-situ* and *in-situ* conservation • Incorporate private, public and community participation • Safeguard genetic diversity	13	7, 12, 16, 18, 19	• 68% of Zimbabwe's people live in the rural areas and derive their livelihoods from agriculture and biodiversity • Agro-biodiversity is of great importance to Zimbabwe as an adaptation strategy in the face of climate change. • Conservation of the local landraces, which have adapted to and do well in harsh and marginal conditions, is important for food security, and maintaining agro-biodiversity is a way of enhancing resilience	National government

Strategic Objective 4: Enhance the benefits to all from biodiversity and ecosystem services

Target	Strategies	ABT related to target		Significance of target to Zimbabwe	Level of government to which target applies
		Wholly or partially	Indirect		
By 2020, implement policies and strategies to maintain and restore ecosystem integrity and reduce ecosystems degradation to enhance the livelihoods and well-being of all Zimbabweans, especially of women, indigenous and local communities, and the poor and vulnerable	• Improve conservation and management status of ecosystems • Promote an ecosystems approach to livelihood enhancement • Strengthen enforcement of laws and policies • Use gender mainstreaming • Increase the basket of income-earning opportunities • Enhance ecosystem resilience • Adopt and implement the Nagoya Protocol	14	1, 2, 3, 4, 5, 6, 7, 8, 11, 13, 15, 16, 17, 18, 19, 20	Although though the CAMPFIRE programme Zimbabwe is renowned for its participatory approaches to conservation, it has seen its performance decline for various reasons. Some of the threats facing biodiversity in Zimbabwe, such as unsustainable harvesting, habitat destruction and wildfires, are linked to reduced benefits from biodiversity – actual and perceived – for local and other stakeholders	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils
By 2020, combat desertification and enhance ecosystem resilience through conservation and restoration of degraded ecosystems		15, 5	7, 11, 14, 15,	Agricultural drylands constitute about 42% of the total arable land in Zimbabwe. Large tracts of these drylands are subject to various degrees of land degradation, which reduces the social and biological potential of the land and increases the effects of desertification. Combating land degradation will enhance ecosystem resilience and livelihoods	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils
By 2015, accede to and domesticate the Nagoya Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization		16, 18	19	Indigenous traditional knowledge and associated genetic resources are now recognized not only as a means to biodiversity conservation but also for commercial benefits. To ensure conservation resources, local communities must benefit from commercial exploitation of the resources	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils

Strategic Objective 5: Enhance implementation through participatory planning, knowledge management and capacity building

Target	Strategies	ABT related to target		Significance of target to Zimbabwe	Level of government to which target applies
		Wholly or partially	Indirect		
By 2015, NBSAP updated and adopted as a policy instrument, and implementation has commenced	Lobby for adoption of the NBSAP as policy instrument	17	20	NBSAP1 lost momentum in the implementation stage due to inadequate coordination and resources. Updating was therefore essential for revision on the coordination and means of ensuring the plan is resourced	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils
By 2020, the traditional knowledge, innovations and practices of local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected and integrated and reflected in the implementation of NBSAP with the full and effective participation of local communities, at all relevant levels	• Empower local communities to develop and implement local environment action plans • Acknowledge and incorporate indigenous knowledge systems	18, 16		Indigenous knowledge is a critical component of environmental management and conservation of biodiversity. Including and empowering local communities to develop and implement local environment action plans ensures that community ownership and sustainability of the programme are enhanced	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils
By 2020, science, technology and innovation relating to biodiversity, its values, functioning, status and trends and the consequences of its loss are strengthened, improved, widely shared, transferred, and applied	Use enabling provisions in the current science, technology and innovation policy	19, 1, 18	2, 3, 4, 6, 9, 11, 12, 13	This would enhance sharing, transfer and application of technology among stakeholders, as well as improve communication, education and awareness on biodiversity and ecosystem services	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils

Strategic Objective 5 (continued)

Target	Strategies	ABT related to target		Significance of target to Zimbabwe	Level of government to which target applies
		Wholly or partially	Indirect		
By 2020, mechanisms for resource mobilization and accounting are established and financial resources from national budgets and other sources for the implementation of NBSAP increased from current levels	• Review the scale of fines for environmental infringements • Undertake a valuation of ecosystems to make a business case for biodiversity • Promote payments for ecosystems services • Biodiversity to benefit from Environment Fund	20, 17		Resource mobilization is critical for the success of the implementation of NBSAP2	• National government • Provincial and metropolitan councils • Local authorities: urban and rural district councils

SECTION II: Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

This section describes measures that have been taken to contribute to the implementation of each target of NBSAP2, as well as an assessment of the effectiveness of the measures in achieving the desired outcome. The obstacles encountered in the implementation and the scientific and technical requirements for addressing them are presented.

TARGET 1: By 2020, at least 75% of the population is aware of the values of biodiversity and the steps they can take to conserve and use it sustainably

Target 1 has seven actions for implementation towards enhancing biodiversity awareness in Zimbabwe (Table 1, Target 1). The main strategy of the target is the development and implementation of a comprehensive communication, education and public awareness strategy for the conservation and sustainable use of biodiversity.

2.1.1. Biodiversity awareness activities

The Ministry of Environment, Tourism and Hospitality Industry (METHI) through its agencies – the Environmental Management Agency (EMA), Zimbabwe Parks and Wildlife Management Authority (ZPWMA) and the Forestry Commission – as well as local councils, NGOs and private companies, have undertaken a variety of awareness campaigns about the value of biodiversity and its conservation. The types and range of awareness-raising methods used by the organizations in the country are shown in Table 2, Target 1.

Table 1, Target 1: The strategy, actions and indicators for Target 1 and summary comments on progress on implementation

Exhibitions and shows are among the main events used to reach out to stakeholders and raise awareness of products or pertinent global, national, regional or local environmental issues. There are more than 20 shows and exhibitions that are held annually across the country, including agricultural shows in Harare, Midlands, Gwanda, Chegutu, Lowveld, Mashonaland East, Kadoma, Masvingo, Manicaland, Hwange, Chipinge, Chinhoyi and Mazowe Valley, as well as the Zimbabwe International Trade Fair (ZITF). The two biggest shows are the Harare Agricultural Show, which is the country's premier agricultural event. It is organized by the Zimbabwe Agricultural Society and generally attracts more than 500 exhibitors and over 180,000 people annually.[1] The ZITF is held in Bulawayo.

Many organizations are involved in environmental education programmes, including youth and wildlife clubs. The Eco Schools Programme at Mukuvisi Woodlands in Harare aims to provide schoolchildren with hands-on experiences and opportunities to tackle issues and concerns in the environment.[2] BirdLife Zimbabwe runs a youth club project whose goal is to connect people aged from 18 to 35 to nature through birds.[3] It has a bird awareness programme that offers various projects aimed at raising awareness in schools throughout the country about the conservation of birds and the need for environmental management.[4] The Lowveld Rhino Trust develops and distributes educational materials about rhinos and their habitats for primary schools in the buffer zone of key rhino habitats in Zimbabwe.[5] Painted Dog Conservation has an education and outreach programme that annually hosts about 1,000 primary schoolchildren.[6]

Table 2, Target 1: Types of activities for raising awareness about the values of biodiversity and its conservation by some of the major institutions in the biodiversity conservation sector of Zimbabwe

Table 3, Target 1 shows the biodiversity and environmental awareness-raising activities of the EMA in collaboration with agencies such ZPWMA that were done in 2015 and 2016, as well as the estimated numbers of people reached. Activities such as commemorations are done jointly or in collaboration with other agencies such as the Forestry Commission and ZPWMA. The data suggest that about 4.7 million people were reached through awareness activities by EMA in 2015, while in 2016 at least 8 million people were reached.

Table 3, Target 1: Awareness activities about biodiversity and the environment undertaken by EMA and other agencies as well as estimated number of people reached

2.1.2 Implementation of Target 1

The strategy proposed for the implementation of Target 1 is to develop and apply a comprehensive communication, education and public awareness campaign about the conservation and sustainable use of biodiversity. The strategy is still to be developed, and

there is therefore no specific or standard communication, education and public awareness framework, platform or approach that is being used by the various organisations and institutions in the biodiversity conservation sector.

The strategy calls for selected champions to drive awareness of biodiversity among sectors such as mining, agriculture, youth and gender. There have been appointments for environmental and biodiversity ambassadors, notably a Green Ambassador, Pangolin Ambassador, Elephants Ambassador, Big Five Ambassador and Tourism Ambassador.

Target 1 also calls for the expansion of biodiversity issues in school curricula and tertiary institutions. The Curriculum Framework for Primary and Secondary Education (2015 – 2022) of the Ministry of Primary and Secondary Education (MPSE 2015) came into effect in January 2017. The new curriculum has environmental management as one of the key cross-cutting themes with components taught at both primary and secondary levels. There are 21 universities, eight polytechnics and 14 teachers' colleges in Zimbabwe,[7] and most provide courses on various aspects of biodiversity conservation, environmental management and sustainable development.

The promotion and facilitation of academic research and publications, as well as production and dissemination of simplified versions of academic publications, are among the actions proposed towards attainment of Target 1. The indicator for the action is production of at least 20 peer-reviewed publications on biodiversity, which would be available in the clearing house mechanism (CHM). Annually, more than 100 peer-reviewed publications on biodiversity are produced in Zimbabwe. Unfortunately, although the CHM was initiated in 2014/2015, it has not been operationalized, largely due to limitations in human capacity.

Information for public awareness campaigns on fire, invasive species, biosafety, deforestation, pollution and land degradation is widely available and distributed in a variety of ways by a number of organizations, including EMA, ZPWMA and the Forestry Commission. Although NBSAP2 was published and distributed during consultative meetings held across the country to review its progress, many stakeholders felt that it has not been publicized widely enough. Summary versions of NBSAP2 have not been produced. A survey to assess the levels of understanding (knowledge, attitudes and practices) of biodiversity is also still to be conducted.

2.1.3 Effectiveness of biodiversity awareness activities

Based on available data and feedback from stakeholder consultative workshops in Chinhoyi, Mutare, Bulawayo, Harare, and Kadoma, awareness of the value of biodiversity and the steps that can be taken to conserve it is high among the people of Zimbabwe. About 75% of the participants in the workshops felt that the broad and extensive activities of various actors using various modes of communication about the environment and biodiversity conservation have ensured that information is readily available and that more than 90% of the people are well informed about biodiversity conservation.

2.1.4 Obstacles encountered in implementation of Target 1

The obstacles that have been encountered in the implementation of Target 1 are:

- Limited coordination among the various institutions and organizations in collection and analysis of data and information about biodiversity awareness programmes and activities
- Failure to establish a functional clearing house mechanism through which information about activities and aspects to enhance biodiversity awareness and conservation is collected, housed and analysed

2.1.5 Scientific and technical needs for Target 1: Technical training in data collection, storage, management and analysis and operation and maintenance of a clearing house

TARGET 2: By 2020, biodiversity is mainstreamed into all seven sectors (mining, agriculture, health, manufacturing, transport, energy and education) and incorporated into national accounting and reporting systems

Two strategies were proposed for mainstreaming of biodiversity into all economic sectors: developing a biodiversity policy, and using biodiversity and ecosystem services valuation tools (Table 1, Target 2). Nine actions were identified towards achieving the target.

Table 1, Target 2: The strategies, actions and indicators for Target 2 and summary comments on progress on implementation

2.2.1 Zimbabwe's policies: A review of biodiversity mainstreaming

Zimbabwe held elections on 30 July 2018 which ushered in the Second Republic. Its key initiatives include reconstruction of the State to make systems of governance community-based and people-centred, and to align policies and legislation with the Constitution.

The Constitution of Zimbabwe Amendment (No. 20) Act of 2013 affirms environmental rights of every citizen. Section 73 of the Constitution asserts that all people have the right to an environment that is not harmful to their health or well-being and to have the environment protected for the benefit of present and future generations. It states that there should be reasonable legislative and other measures which prevent pollution and ecological degradation, pro-

mote conservation and secure ecologically sustainable development and use of natural resources while promoting economic and social development. It calls upon the State to take reasonable legislative and other measures within the limits of the resources available to it to achieve the progressive realisation of environmental rights.

Zimbabwe is a signatory to most of the important international policy frameworks on the environment, including the Convention on Biological Diversity (CBD), United Nations Framework Convention on Climate Change (UNFCCC), Convention on the Conservation of Migratory Species of Wild Animals (CMS) and the Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES).

The National Environmental Policy and Strategy (2009) aims at avoiding irreversible environmental damage, maintaining essential environmental processes and preserving the broad spectrum of biological diversity to sustain the long-term ability of natural resources to meet basic human needs, enhance food security, reduce poverty and improve living standards of Zimbabweans through long-term economic growth and job creation. Specifically, its objectives are to:

- Integrate environment in all development policies, programmes and management plans
- Have in place a sound environmental information system
- Enable human resource and technical capacity development to identify, assess, evaluate and respond to the possible impacts of development on environmental structure and functioning
- Facilitate research and monitoring to assess the effectiveness of the implemented measures

Therefore, over the years, the country's policy framework has been directed towards ensuring social and economic development through sustainable utilization of natural resources. Among the acknowledged requirements toward sustainable development has been the need for mainstreaming of biodiversity in formulating and implementing the country's policies.

This section looks at the country's policies and strategies that have been developed over the last five years and whether they recognize and incorporate the importance of biodiversity to development and well-being.

2.2.1.1 Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZimAsset) 2013-2018

ZimAsset was the key national development policy framework from October 2013 to December 2018. Its goal was to provide an enabling environment for sustainable economic empowerment and social transformation to the people of Zimbabwe. It was a cluster-based policy plan which addressed four clusters: food security and nutrition; social services and poverty eradication; infrastructure and utilities; and value addition and beneficiation.

Environmental management and the protection and conservation of habitats and biodiversity were under the food security and nutrition cluster, and the following strategies were highlighted:

- Promote production of high-yielding drought- and heat-tolerant crops
- Establish livestock breeding and multiplication centres
- Strengthen livestock pest and diseases surveillance programmes
- Strengthen livestock research and extension services
- Implement livestock drought mitigation programmes
- Undertake awareness and education on conservation agriculture
- Promote environmental advocacy and awareness campaigns
- Enact legislation to manage the environment effectively
- Formulate a national climatic change policy
- Capacitate ZPWMA to combat poaching
- Institute methods for increasing wildlife species, flora and fauna
- Update reports of the ecosystem and its preservation

2.2.1.2 Transitional Stabilisation Programme reforms agenda October 2018-December 2020

The Transitional Stabilisation Programme (TSP) reforms agenda succeeds ZimAsset. Its major goal is to transform Zimbabwe to an upper-middle-Income economy by 2030. The realisation of that goal (Vision 2030) will be achieved through the implementation of the TSP and two five-year development strategies, the first running from 2021 to 2025 and the second from 2026 to 2030.

A major strategy of the programme is the implementation of productive sector reforms. There are four areas of reform: smart agriculture; mining exploration and development; resuscitating industry and industry development; and protecting the environment.

Under the objective of protecting the environment, the programme seeks to accomplish the following:

- To enhance environmental management by protection, restoration and promotion of sustainable use of terrestrial ecosystems, sustainable management of forests, combating desertification, halting and reversing land degradation and biodiversity loss
- To promote community wildlife management in order to: aid the eradication of poaching and trafficking of protected species of flora and fauna; address demand and supply of illegal wildlife products; and enhance livelihoods of communities living in proximity to protected areas
- To strengthen initiatives to protect wetlands so as to reduce or halt their rate of destruction
- To reduce veld fires by intensifying the implementation of national fire protection strategies

- To enhance integrated urban settlement plans so as to promote environmentally sustainable development
- To implement integrated solid waste management plans
- To integrate mitigatory measures into national policies, strategies and planning in order to strengthen resilience and adaptive capacity in regard to climate-related hazards and natural disasters
- To promote climate-resilient water management systems, focusing on crops and livestock

2.2.1.3 National Agriculture Policy Framework (NAPF) 2018-2030

The overall goal of the NAPF is to create an environment that enhances the sustainable flow of investment to the agricultural sector to enhance productivity and production, ensure food and nutrition security and promote national economic growth and development.

With regard to environmental management and biodiversity conservation, the policy framework aims at:

- Balanced exploitation of agricultural land and its environs to grow the economy and sustain livelihoods with the sustainable use and renewal of environmental ecosystem services
- A more strategic engagement and judicious management of agricultural activities in relation to urban expansion, natural resources and biodiversity management, and land tenure security
- The sustainable utilisation of fragile habitats such as wetlands and other biodiverse habitats

2.2.1.4 National Climate Policy November 2017

The National Climate Policy seeks to provide an overarching framework under which the country's National Climate Change Response Strategy (NCCRS) and other climate-related strategies will be implemented. It is expected to assist the country to meet its Nationally Determined Contributions (NDCs) to the UNFCCC, create resilient communities and drive the country towards an economy that is largely decoupled from climatic variations. It calls for: climate-proofing of other policies and socio-economic infrastructure; strengthening of climate change governance; increased education and awareness; improved early warning and climate services; research to inform planning and future policy orientation; and a robust sustainable climate finance framework.

The policy notes that projected climate changes will impact water, agriculture, energy, industry, health, infrastructure, and forestry and biodiversity. It calls for development of specific policies to strengthen adaptive capacity in all these key sectors and among communities in the context of climate change. The policy with respect to the forestry and biodiversity sector commits the government to:

- Conserve and enhance forestry resources which act as both sinks and reservoirs of greenhouse gases
- Strengthen afforestation programmes that promote drought- and heat-tolerant tree species
- Strengthen research capacity in forest ecosystem resilience to facilitate adaptation efforts to climate change
- Establish permanent forest ecosystem monitoring plots to check for signs of forest dieback as a way to plan afforestation programmes based on appropriate species
- Promote research to reduce the gaps in knowledge about forest ecosystems, climate change and threats to forests such as fires
- Promote improved understanding of the role played by forests in supporting livelihoods through timber and non-timber products and of the effects that climate change could have on those livelihoods
- Strengthen the framework for Reducing Emissions from Deforestation and Forest Degradation (REDD+) and other financing mechanisms
- Strengthen enforcement and other measures to reduce deforestation and forest degradation
- Support research to enhance understanding of climate change impacts on wildlife and adaptive management planning for key wildlife species
- Monitor and reduce the prevalence of invasive plant species
- Strengthen the use of information communication technology and the latest technologies in forest and biodiversity management.

2.2.1.5 Zimbabwe's National Climate Change Response Strategy (ZNCCRS)

The goal of the ZNCCRS is to mainstream climate change adaptation and mitigation strategies in economic and social development at national and sectoral levels through multi-stakeholder engagement.

With regard to biodiversity and ecosystems the strategy aims to:

- Promote and strengthen biodiversity conservation management and the integrity of natural ecosystems by using an ecosystem-based approach to adapt to climate change
- Promote appropriate climate-smart land use options for the drier natural regions where cattle production and wildlife ranching are the most suitable land use options
- Strengthen the effectiveness of Transfrontier Conservation Areas as a mechanism for sustainable biodiversity conservation and climate adaptation

2.2.1.6 Zimbabwe United Nations Development Assistance Framework (ZUNDAF), 2016- 2020

ZUNDAF is the UN strategic programme framework to support national development priorities as informed by ZimAsset and to advance the achievement of the Sustainable Development Goals as well as other

international commitments, norms and standards. It is guided by six national priority areas: food and nutrition security; gender equality; HIV and AIDS; poverty reduction and value addition; public administration and governance; and social services and protection.

The framework acknowledges the importance of the environment in attaining its objectives. Under the food and nutrition security priority area, it emphasizes that the country's current energy challenges and traditional dependency on biomass for energy are putting great pressure on natural forests, resulting in deforestation and land degradation. This worsens the greenhouse effect and disrupts the water cycle, eventually impacting the availability of water for agriculture and other social and economic uses and contributing to food and nutrition insecurity. ZUNDAF calls for stakeholders in the agriculture, social protection, health, nutrition, environment and water and sanitation sectors to address food and nutrition insecurity using a multi-sectoral approach that will include risk-sensitive and sustainable agricultural production in line with international environmental commitments. It emphasizes the need for the promotion of resource-efficient technologies, sustainable land and water resources management and renewable and sustainable energy solutions crucial for sustained food and nutrition security that spans generations. Under poverty reduction and value addition, the framework recognizes the importance of integrating the principles of environmental sustainability and gender equality and equity.

2.2.1.7 Zimbabwe National Policy for Information and Communication Technology 2016- 2020

The policy seeks to exploit the potential of ICT for sustainable socio-economic development. The policy states that it aims to reduce environmental degradation and reduce human and animal exposure to harmful emissions emanating from telecommunication systems and devices. The policy recognizes that the rapid growth in electronic waste (e-waste) volumes is a serious threat to the environment and proposes the development of a framework for e-waste management that will incorporate the establishment of recycling facilities and raising awareness about safe and timely disposal of obsolete electric and electronic equipment. It also sees a need for the use of ICTs for disaster and climate change management. For this it proposes a multi-stakeholder initiative to explore strategies and measures on how ICTs can help implement the Sendai Declaration and Framework for Disaster Risk Reduction 2015-2030, achieve the 2030 Agenda for Sustainable Development and mitigate the effects of climate change.

2.2.1.8 National Health Strategy, 2016-2020

The vision of NHS is to have the highest possible level of health and quality of life for all Zimbabweans. It seeks to address priority challenges in the management of all physical, biological, chemical, social and psychosocial factors in the environment, including compliance with international legislation and conventions by strengthening environmental services, early detection of disease outbreaks and man-made disasters. To strengthen priority health programmes, it identifies seven goals. Those related to the environment are:

- Improve management of waste (solid, liquid, chemical, radiation and noise) and reduce pollution
- Reduce air, water and terrestrial pollution by strengthening public health regulations and awareness on environmental contamination
- Improve climate change awareness
- The NHS proposes the following strategies to enhance environmental protection:
- Improving water and sanitation infrastructure
- Promoting appropriate water treatment and waste management methods
- Monitoring water quality and environmental pollution
- Resourcing and strengthening regulating institutions
- Strengthening pest/vector control

2.2.1.9 Zimbabwe School Health Policy 2018

The school health policy offers a broad frame of reference to guide the implementation of a number of health-related interventions relating to the welfare of pupils. Its aim is to operationalize comprehensive school health programming from the time children begin infant education to their exit upon completion of secondary education. Among considerations for a safe school environment, the policy stresses that the promotion of environmental awareness, conservation and sustainable waste management should be emphasized at all levels in schools. It calls for each school to have a disaster risk management system for early warning and response to disasters.

2.2.2 Implementation of Target 2

The policy framework and all the policies and strategies that have been developed over the last decade acknowledge the need for environmental and biodiversity conservation for sustainable development and biodiversity to be streamlined in all sectors. Through the TSP reforms agenda, the government is aligning all statutes with the Constitution, which gives an opportunity for analysis of policy shortcomings and the enhancement of biodiversity mainstreaming.

NBSAP2 has two strategies for the implementation of Target 2: developing a biodiversity policy to be mainstreamed in all sectors and incorporated into the national accounting and reporting system; the use of biodiversity and ecosystems services valuation tools to quantify economic, social, cultural and ecological values. Discussions with a broad range of stakeholders have been held on the need for a biodiversity policy. The consensus has been that the existing legal framework on the environment and biodiversity is

adequate, although reviews of certain aspects are required that can be addressed in statutory instruments.

Several studies on ecosystem services valuations have been conducted,[8] [9] and NBSAP2 has been endorsed by the government. Analysis of 22 randomly selected annual reports of the 64 companies listed on the Zimbabwe Stock Exchange in 2017 showed that 45.5% of them incorporated environmental reporting – i.e. their impacts on the environment and measures taken to mitigate negative effects – in their reports, although the format and levels of detail varied substantially. The uptake of environmental reporting is relatively low probably because environmental reporting is not mandatory in Zimbabwe and there is limited capacity in ecosystems services valuation and environmental reporting and accounting.

2.2.2 Effectiveness of measures for Target 2

There is satisfactory progress on mainstreaming of biodiversity in all sectors in the country, and the overall implementation of Target 2 has been effective. Biodiversity and environmental issues are reflected in the national development blueprint. NBSAP2 was endorsed by the government and there has been an increase in financial resource allocation to METHI of more than 10% from the 2012 baseline.

2.2.3 Obstacles encountered in implementing target 2

The main obstacle in implementing Target 2 has been the relatively low uptake of environmental reporting by companies, probably due to limited capacity in ecosystems services valuation and environmental reporting and accounting , and because environmental reporting is optional in Zimbabwe.

2.2.4 Scientific and technical needs to achieve Target 2: Training in biodiversity and ecosystem service valuation and environmental reporting and accounting.

TARGET 3: By 2020, reduce the rate of loss of natural habitats, including forests, by at least 50%

2.3.1 Threats and challenges to Zimbabwe's natural resources base

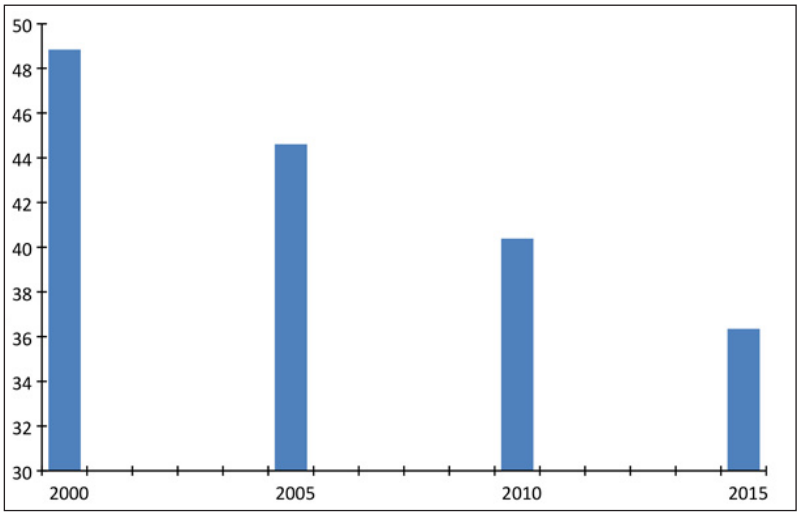
Zimbabwe faces numerous challenges in the management and sustainable utilization of its resources and the environment. The major threats to its natural resources are climate change, agricultural expansion, infrastructural development and encroachment by settlements, illegal wildlife trade, and over-reliance on wood energy. This has resulted in a multitude of environmental challenges, including biodiversity loss, poor waste management, pollution and land degradation and deforestation. Target 3 identifies three strategies and 10 actions for reducing the rate of loss of natural habitats by at least 50% by 2020 (Table 1, Target 3).

2.1.2 Change in forest cover

Forest area coverage in Zimbabwe gradually decreased from 49% in 2000 to approximately 36% in 2014 (Figure 2.1). From 2001 to 2017, the country lost about 191,000 ha of tree cover, equivalent to a 13% decrease since 2000.[10] Over-reliance on wood energy and agriculture expansion have been the main drivers of tree cover loss. Fuelwood provides about 61% of the country's total energy supply, and firewood is the main source of energy for heating and cooking, with an annual household consumption of 4.2 tons. By 2016, 85.5% of the urban population had access to electricity compared with only 15.5% of rural population.[11] Most people who do not have access to electricity use fuelwood.

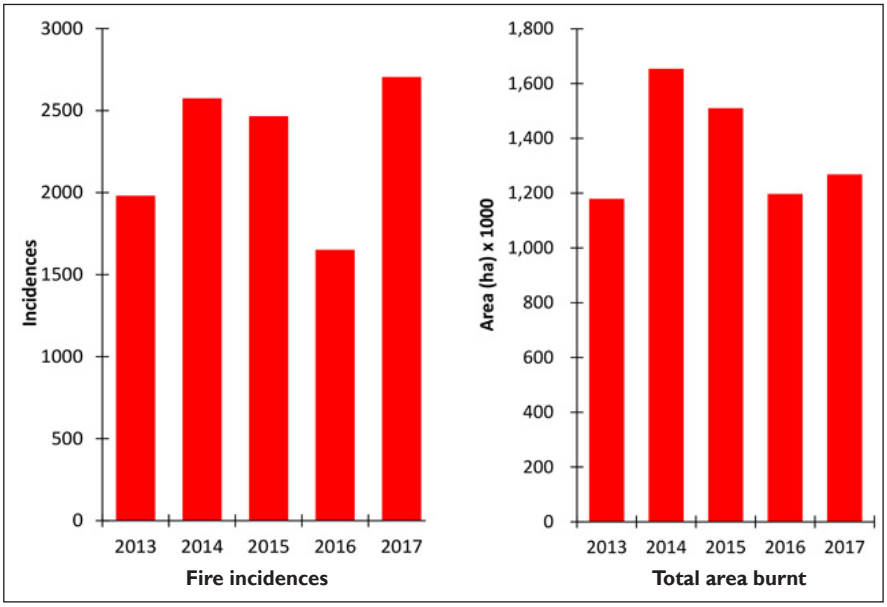
The clearing of woodlands for cultivation of crops, particularly tobacco, has been a major threat to forests. Before 2000, about 1,500 large-scale tobacco farmers grew 97% of the crop. In 2000, the government launched the Fast Track Land Reform Programme (FT-

Figure 2. 1 Forest area as a percentage of total land area



Source: United Nations Statistics Division: https://unstats.org

Figure 2. 2 Fire incidence and total area burnt scross Zimbabwe 2013-2017



Source: EMA fire reports: www.ema.co.zw

LRP), through which 10 million ha were transferred to around 146,000 smallholder farm families in A1 resettlement areas and 23,000 medium-scale farms (A2 resettlements).[12] One of the major successes of the FTLRP was that it opened up the tobacco industry to more growers, and the number of active tobacco growers has been on an upward trend since 2010.[13] Farmers who registered to grow tobacco increased from 81,801 in 2016 to a 98,927 in 2017, an increase of 21%. Mashonaland West and Mashonaland Central provinces had the highest number of registered tobacco growers – 38% and 36% respectively. In 2017, tobacco farmers in the resettled areas produced about 60% of the national tobacco crop.

The large-scale commercial farmers who dominated the industry prior to the FTLRP generally used coal and planted Eucalyptus woodlots for curing tobacco. Most of the small-scale farmers dominating the industry today burn wood to cure tobacco. It is estimated that these farmers use about 43 cubic metres of fuelwood (15,000 kg per year) to produce an average of 1,400 kg of cured tobacco, which amounts to 10.7 kg of wood to produce a kilogram of tobacco. It has been estimated that the dependence by 90% of tobacco farmers on fuelwood for curing has contributed 15% to deforestation.[14]

Another aspect of loss of forest cover in Zimbabwe is veld fires. The incidence of fires across the country has been above 1,500 fires since 2013, with the highest incidence of 2,705 recorded in 2017 (Figure 2.2). The total area burnt increased by approximately 40% from 1,179,274 ha in 2013, to 1,653,822 ha 2014. Since 2014, there has been a gradual decrease of about 10% annually in total area burnt.

Target 3 and its implementation

The aim of Target 3 is by 2020 to reduce the rate of natural habitat loss by at least 50%. Three strategies were identified: strengthen institutional capacity for implementation of biodiversity and ecosystems conservation; promote sustainable land management practices; and promote and lobby for development of renewable energy and energy saving alternatives.

2.3.3.1 Strengthen institutional capacity for implementation of biodiversity and ecosystems conservation

According to the African Capacity Building Foundation (ACBF),[15] Zimbabwe was ranked 35 out of 44 African countries in the African Capacity Index (ACI) or level of capacity development, with a medium score of 46.3 out of 100. The country's relatively weak institutional capacity has been identified as drawback in achieving its development goals, and strengthening the capacity of institutions involved in biodiversity conservation is essential in reducing loss of habitats.

2.3.3.2 National fire strategy

Due to the high incidence veld fires, systematic implementation of a national fire protection strategy was identified as crucial to prevent or slow loss of forests. The main pieces of legislation that govern veld fire management in Zimbabwe are the Forest Act (CAP 19:05), the Traditional Leaders Act and Statutory Instrument 7 of 2007 (Environmental Management, Environmental Impact Assessment and Ecosystems Protection Regulation). Under the METHI, an expansive fire management framework has been put in place with the following objectives: establishing an appropriate institutional framework to effect fire management for implementation, monitoring, surveillance, reporting and law enforcement, and promoting public awareness on fire management to foster environmen-

tal stewardship. Under the framework, a national fire committee was constituted with representatives of sector ministries and other stakeholders. It works with the provincial development committees under the direction of the ministers of state for provincial affairs to develop and implement veld fire management plans. Under this arrangement all governance institutions – traditional leaders and development committees at village, ward and district level – develop action plans that are approved by the national fire committee.

EMA has been coordinating the implementation of the fire management plan. Among its responsibilities are fire monitoring, fire prediction modelling, conducting fire education and awareness campaigns, capacity building and hosting of national consultative review workshops. Table 2, Target 3 summarizes some of the activities of EMA in the management of veld fires.

Table 2, Target 3: Activities towards management of veld fires

NBSAP set a target of 15% reduction in area burnt per year. Although the target has not been met, there was a decrease in area burnt of about 10% between 2014 and 2017.

2.3.3.3 Capacity building and coordination of law enforcement agencies

Environmental crimes are illegal acts which directly harm the environment – illegal trade in wildlife; smuggling of ozone-depleting substances; trafficking in hazardous waste and chemicals; illegal, unregulated and unreported fishing; and illegal logging and the associated trade in stolen timber. Globally, environmental crime is rising by 5% to7% annually, which is two or three times the rate of the global economy. In 2016 it was estimated at between $91 billion and $258 billion, a 26% increase from 2014.[16] Environmental crimes are increasingly endangering not only wildlife populations but entire ecosystems, sustainable livelihoods and revenue streams to governments.

Zimbabwe has over the years participated in national, regional and international activities to enhance capacity in countering environmental crimes. It ratified the SADC Protocol on Wildlife Conservation and Law Enforcement (1999) and is implementing the protocol in its management of wildlife resources. The SADC Law Enforcement and Anti-Poaching (LEAP) Strategy 2016-2021 was adopted for implementation by member states in November 2015. Zimbabwe has crafted and domesticated a national law enforcement anti- poaching strategy. It intends to launch the International Consortium for Combating Wildlife Crime initiative and build capacity of State agencies in combating wildlife crime.[17] Other strategies that have been used to reduce environmental crimes are: implementation of park and species management plans and policies; enhanced collaboration with the Zimbabwe Republic Police Support Unit in anti-poaching activities at all levels; an increase in the use of aircraft and new technologies; awareness workshops that target the judiciary, prosecutors, law-enforcement agencies and other stakeholders involved in the fight against poaching; enhanced collaboration with the private sector; and cross-border collaboration with law-enforcement agencies in neighbouring countries.

2.3.3.4 Strengthen capacity of local authorities to promote sound environmental management

Under the Environmental Management Act (Chapter 20:27) of 2002, local authorities are mandated to develop local environmental action plans (LEAPs) for the management of the environment in areas under their jurisdiction. EMA has provided training to local authorities on the production of LEAPs since 2003, and 78 of the 88 local authorities had been trained by October 2015.[18] Key stakeholders in the development of LEAPs are community members, government departments, NGOs, local leaders, councillors, private companies and religious groups. In February 2015, EMA held a national stakeholders' conference which discussed the various laws governing environmental management and the METHI implementing agencies and proposals and recommendations for environmental problems and solutions.[19]

As an indicator of the strengthened capacity of local authorities in sound environmental management, Target 3 of the NBSAP proposed the incorporation of NBSAP by at least 50% of local authorities in their plans. So far only a few of the local authorities have done this.

2.3.3.5 Promote sustainable land management practices

Land degradation resulting from unsustainable land management practices is a threat to the environment in sub-Saharan Africa and to livelihoods of the majority of people who depend directly on agricultural production.[20] Land degradation and the decline in ecosystem goods and services from the land negatively affects the state and the management of water, soil, plants and animals, and hence reduces agricultural production (FAO-LADA approach).

In Zimbabwe, the annual cost of land degradation is estimated at $382 million, which is equal to 6% of the Gross Domestic Product.[21] Zimbabwe is party to the UN Convention to Combat Desertification which seeks to reduce desertification, land degradation and drought and their impacts on people living in drylands. The country has come up with the following national voluntary targets and associated measures in order to achieve land degradation neutrality by year 2030:[22]

- Reforestation with local and exotic species of 6,455,250 ha of forest converted to shrubs and 215,050 ha of forest converted to cropland
- Avoiding further decline of forests through economic incentives (rehabilitation) of 2,820 ha of land showing early signs of decline and having declining productivity

- Improving sustainable land management practices to avoid soil and gully erosion, encouraging and enforcing appropriate stocking rates on 175,250 ha of shrubs, grasslands and sparsely vegetated areas showing early signs of decline
- Using conservation farming and agro-forestry practices to improve cropland productivity on 361,250 ha of cropland showing stable but stressed productivity and early signs of decline
- Embarking on land and catchment reclamation and restoration of 5,580 ha of grazing and cropland affected by gully erosion
- Enforcing laws and regulations, embarking on awareness programmes targeting illegal miners (rehabilitation) on 3,798.6 ha affected by illegal mining
- Reducing the 8,857.92 ha affected by alien species through chemical and mechanical control
- Maintaining and improving land productivity on 137,545 ha of forests that are currently stable but stressed
- Providing alternatives such as: rural electrification; renewable energy; expanding energy for tobacco programmes; providing sustainable fencing materials for arable lands and community gardens and for brick burning; enforcing regulations on tree cutting for sale of fuelwood; and reducing deforestation to protect 297,000 ha of forest land
- Enforcing construction of conservation works, encouraging conservation agriculture and building capacity for farmers to improve 1,083,825 ha of degraded arable lands
- Improving sustainable land management systems in order to maintain the current soil organic carbon level beyond 2045 of forests at 42.3 tons/ha; of shrubs, grasslands and sparsely vegetated areas at 38.6 tons/ha; of cropland at 38.9 tons/ha; and of wetlands at 52.2 tons/ha
- Improving wetland management and restoration of 270,080 ha of the country's severely degraded wetlands

A number of programmes that support sustainable land management practices are currently running (Table 3, Target 3).

Table 3, Target 3: Some of the programmes that promote sustainable land management practices

2.3.3.6 Promote and lobby for development of renewable energy and energy saving alternatives

The reliance on wood as a source of fuel for the majority of people in Zimbabwe, especially those in the rural areas and tobacco farmers, has led to decimation of the country's forests (see section 2.3.1). Provision of alternative sources of energy, particularly renewable sources, is acknowledged as being essential in conservation of the environment and biodiversity.

Zimbabwe has huge potential for a renewable energy mix of hydro, solar and biomass resources. However, only a fraction of its hydro and solar energy potential has been exploited, while biomass resources remain largely untapped. Wind and geothermal energy are believed to have less potential than in other countries in the region and projects are therefore less feasible.[23]

Hydropower

Zimbabwe has so far exploited about 19% of its hydropower potential. Its gross theoretical hydropower potential is approximately 18,500 GWh/year, with about 17,500 GWh/year being technically feasible. A number of mini and micro hydro power stations have been constructed and several potential sites identified (Table 4, Target 3).

Table 4, Target 3: Operational, still to be commissioned, non-functional and potential mini and micro hydro power systems in Zimbabwe

Bioenergy

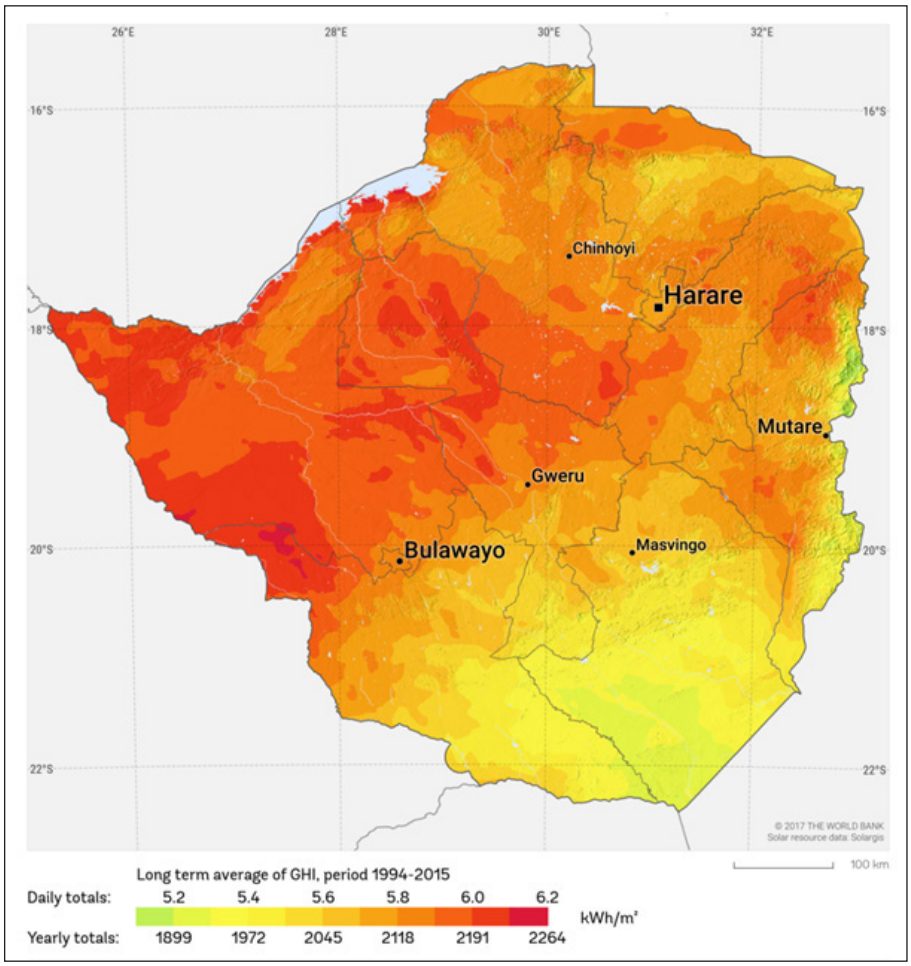
Co-generation potential (bagasse) currently provides 633 GWh of electricity. The primary source of power generation is obtained from the waste materials of sugarcane production. Two sugarcane crushing mills process more than 1.3 million tonnes of bagasse to generate electricity used by the sugar factories. The timber industry also has strong biomass potential, generating over 70,000 tonnes of waste for biomass annually. Long-term projections are for this figure to double. At the larger mills, approximately 10% of the wood waste is consumed in steam boilers for lumber drying kilns. The vast majority of the industry's waste is burned outdoors or discarded. An estimated 4 MW of additional energy could be created by enhancing equipment at these facilities.

An assessment by SNV-Netherlands Development Organization found that Zimbabwe has a high technical potential for domestic biogas as well as a high development biogas feasibility index.[24] The vast livestock population offers great potential for biogas generation, and more than 200 biogas plants have been installed around Zimbabwe, primarily by the Ministry of Energy. The country's first utility-scale biogas power plant (800 kW) is at the planning stage.[25]

2.3.4 Effectiveness of measures for Target 3

The measures taken to reduce the rate of loss of natural habitats have been partly effective, and the various programmes and initiatives that are being implemented put the country on track to succeed in reducing the rate of loss of natural habitats by as much as 50% by 2020. There has been a decrease in area burnt per year since 2014, anti-poaching activities have been enhanced, and interest and investment in renewable energy technologies have increased. There are also a number of community-based natural resources initiatives that have been started.

Figure 2. 3 Solar irradiance across Zimbabwe



Source: World Bank Group, Global Atlas: https://globalsolaratlas.info

2.3.5 Obstacles encountered in implementation of Target 3

- The number of laws that affect investment in and development of renewable energy, with some under the jurisdiction of different ministries
- The economic decline in Zimbabwe over the last decade, since funding for programmes was limited. Some of the outputs that were proposed under ZimAsset and which would have advanced the implementation of the target, but were not fully followed through due to limited resources, are: an increase in the number of farmers adopting conservation agriculture; capacitation of local authorities and of EMA to manage waste and pollution; and updated reports on ecosystems and their status
- The absence of a framework for data collection and analysis for monitoring and evaluating progress on implementation of the target

2.3.6 Scientific and technical needs to achieve Target 3

- Strengthening the institutional capacity of key institutions, notably ZERA, EMA, ZPWMA and the Forestry Commission. This entails increasing financial and material resource allocations as well as enhancing human capacity
- There is need for a framework for monitoring and evaluating the implementation of the target, which requires training of personnel to collect and analyse data

TARGET 4: By 2020, ecosystem-based approaches to aquatic resources management are being applied on Lake Kariba and other water bodies to avoid overfishing, enable the recovery of fish stocks and reduce loss of indigenous species

2.4.1 Zimbabwe's fisheries industry

Zimbabwe has no natural lakes, and although numerous dams are dotted across the country, most of which are small farm dams, per capita fish consumption according to the FAO[26] is very low and amounted to about 2.2 kg in 2010. The major dams are Lake Kariba, which is shared with Zambia, Tugwi-Mukosi Dam, Lake Manyame, Lake Chivero, Lake Mutirikwi, and Osborne, Mazvikadei, Manyuchi and Manjirenji dams. Lake Kariba, on the Zambezi River, dominates fish production

and contributes almost 90% of the country's fish production. The 230 km long lake, with a volume of 180 km3, was built between 1956 and 1959 primarily for hydropower generation. Between 1967 and 1968, Limnothrissa miodon, a clupeid from Lake Tanganyika, was introduced. Within five years it had spread throughout the lake and became the basis for a lucrative capture fisheries industry. The Lake Kariba fisheries have been the most productive in the country, but decreases in catches since 2009 due to fishing pressure[27, 28] and possibly climate change[29, 30] have raised concern. To reduce overfishing and enable recovery of fish stocks, Target 4 was developed, which requires the implementation of two strategies and eight actions (Table 1, Target 4).

Table 1, Target 4: The strategies, actions and indicators for Target 4 and summary comments on progress on implementation

2.4.2 Lake Kariba fisheries

The two major fishery sectors on Lake Kariba are the capture fishery and the aquaculture sector. The capture fishery has three sectors: pelagic or offshore fishery (the kapenta industry); artisanal or inshore fishery (gill-net fishing); and recreational fishing with rod and line. Capture fisheries production is about 10,500 tonnes per year, with kapenta and Nile tilapia contributing over 84% of the fish production.1

The havesting of kapenta is capital-intensive enterprise undertaken with rigs. Since the early 2000s, capacity in the kapenta industry has increased from about 600 rigs allowed on the lake in 1999 to 1,098 in 2012,[31] resulting in an increase in fishing effort by approximately 40% between 2000 and 2011.[32]

The artisanal fishery is centred on several inshore species – the cichlids (*Oreochromis mortimeri*, *Oreochromis niloticus*, *Sargochromis codringtonii*, and *Tilapia rendalli*); the cyprinid (L*abeo altivelis*); the characid (*Hydrocynus vittatus*); the mormyrids (*Mormyrus longirostris, Mormyrops anguilloides*); and the clariid (*Clarius gariepinus*). The artisanal fishers are based in villages or camps spread along the shoreline. On the Zimbabwean side of the lake there are 41 fishing villages and in 2011 there were 1,154 licenced artisanal fishers .[33]

2.4.3 Target 4 and its implementation

Target 4 of Zimbabwe's current NBSAP aims at promoting the application of ecosystem-based approaches to aquatic resources management on Lake Kariba and other water bodies in Zimbabwe. The goal is to avoid overfishing and enable the recovery of fish stocks as well as reduce loss of indigenous species. Two strategies were identified: develop and implement integrated ecosystem based management; and develop a fisheries and aquaculture policy.

2.4.3.1 Integrated ecosystem based management plan

NBSAP2 proposed development of an integrated ecosystem-based management plan with seven key activities:

- Monitor and effectively manage fish stocks of key commercial species
- Promote the implementation of a code of conduct for responsible fisheries
- Develop appropriate monitoring mechanisms for water quality and determinant factors in key water bodies
- Adopt and implement international guidelines for securing sustainable small-scale fisheries
- Develop an appropriate framework to strengthen community-based management of fisheries, including monitoring and reporting
- Enhance transboundary management of aquatic resources
- Monitor aquaculture and promote use of indigenous species

Target 4 also proposed as a strategy the development of a fisheries and aquaculture policy

Monitor and effectively manage fish stocks of key commercial species

The Lake Kariba fishing industry, especially the pelagic or deep-water kapenta fishery, is co-managed by Zambia and Zimbabwe. According to the Protocol on the Management of the Shared Fisheries Resources on Lake Kariba, there are supposed to be 275 licensed rigs in Zimbabwe and 225 in Zambia. Since 2006, there has been an increase of about 300% in the number of rigs allowed on the lake, mainly on the Zambian side, and a correspondingly large increase in fishing effort. The last frame survey in 2011 showed that a large number of vessels are not registered and operate illegally, without a licence (Illegal, Unreported and Unregulated Fishing).[34] Using a bioeconomic model, Kinadjian compares the fishing effort in 2013 of 275,000 nights fished (equivalent to 1016 rigs) with the fishing effort of 119,000 nights fished (equivalent to 437 rigs) which is needed to harvest the kapenta resource at the maximum sustainable yield (MSY). The bio-economic model established that the kapenta fishery was therefore overexploited, and the excess of fishing effort relative to the fishing effort at MSY was about 100%. According to Tendaupenyu and Pyo[35], the MSY for kapenta is 25,372 tonnes, with catches lower than the MSY even with increased effort. Kinadjian shows that the fishery has been generating about $20 million per year compared to about $37,7 million per year that can potentially be obtained at the maximum sustainable production level. Overexploitation has therefore compromised the role of the kapenta industry in food security in the two countries (Kinadjian 2013). A 2018 report further highlighted the dire situation of the industry, with one fishing company reporting that it harvests only 40 kg of kapenta per night compared to between 500 kg to 1,000 kg per night in previous years.[36] To counter the increase in fishing effort and its effects on the kapenta industry, the ZPWMA banned fishing operations during full moon, which has resulted in a 23% decrease in fishing effort on the Zimbabwean side. Be-

sides the issue of kapenta and ongoing water quality monitoring done by EMA and ZINWA, most of the measures listed in Target 4 are in the early phases of implementation (Table 1, Target 4).

2.4.4 Effectiveness of the implementation measures for Target 4

The measures taken in implementing Target 4 have been partly effective. Monitoring and production of annual reports on fish stocks have been done on Lake Kariba, but there is limited information from most of the other dams. Discussions about a fisheries policy are being held and a database on aquaculture is being developed.

2.4.5 Obstacles encountered in implementation of Target 4

The lack of human and material resources has been a major obstacle to monitoring the status of fisheries resources. Most of the fish production data are from Lake Kariba, and most dams have no fisheries monitoring programmes. Lakes Kariba, Chivero, Manyame and Mutirikwi, which historically have fisheries research units, have over the last decade suffered from lack of investment in infrastructure and human resources.

2.4.6 Scientific and technical needs to achieve Target 4

To strengthen aquatic resources conservation in Zimbabwe and enhance the contribution of fisheries to food security and nutrition, it is essential to invest in human capital and provide the necessary infrastructural support. There are fewer than 20 aquatic ecologists who are actively engaged in fisheries or aquatic resources monitoring and management

There is need to speed up the development of the fisheries policy which has been under discussion for a number of years

The aquaculture industry is being strongly promoted and experiencing a boom; it is necessary for an assessment of whether the fisheries policy being developed adequately covers the sector

TARGET 5: By 2020, 60% of areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity and sustainable land use

2.5.1 Agriculture, forestry and aquaculture

About 162,000 km2 is under agriculture in Zimbabwe, which is about 41.88% of the country's land mass.[37] Agriculture is a cornerstone of the Zimbabwean economy, contributing 15-18% of GDP, over 40% of national export earnings and 60% of raw materials to agro-industries, and over 70% of the population derives livelihoods from the agricultural sector.[38] Forests covers approximately 140,620 km2, which is about 36.35% of the country's land area. Although aquaculture production is small compared to other countries in sub-Saharan Africa, the sector has been receiving strong government support and interest in it is growing among the population. Table 1, Target 5 shows the strategy and nine actions that have been proposed to ensure biodiversity conservation and sustainable land use of areas under agriculture, aquaculture and forestry.

2.5.2 Conservation of agricultural land

Conservation agriculture (CA) is a set of soil management practices that reduce soil degradation and nitrogen loss in the soil, conserve soil moisture and improve efficiency of applied nutrients.[39] CA is built on three principles – minimum soil disturbance, permanent soil cover and crop rotation – that are known to reduce erosion, improve soil quality, conserve water, reduce fuel costs and, above all, improve yields.[40] Governments and various organizations in southern Africa have promoted conservation agriculture, especially among resource-limited smallholder farmers, to enhance farmers' yields, incomes, food security and livelihoods as well as conserve the environment.[41], [42], [43]

Table 1, Target 5: The strategy, actions and indicators for Target 5 and summary comments on progress on implementation

2.5.3 Forest loss and conservation

Forest cover in Zimbabwe decreased between 2000 and 2015 (see Target 3) and the rate of deforestation has since 2008 been estimated at about 330,000 ha per year.[44] The Forestry Commission has a number of programmes for sustainable utilisation and management of forest resources – forest protection, tree breeding, promotion of agro-forestry and indigenous silviculture.[45]

Tobacco farming has caused about 15% of the deforestation because 90% of tobacco farmers depend on fuelwood for curing.[46] To reduce the harmful impact of tobacco farming and other agricultural activities on forests, the government seeks through the Comprehensive Agricultural Policy Framework (2012 – 2032) to:

- Promote the planting of timber plantations for construction timber and firewood for domestic use and tobacco curing
- Encourage the use of more efficient tobacco curing facilities
- Assist in enforcing regulations in rural areas to reduce veld fires and maintain ecosystem diversity
- Promote agro-forestry

A number of other initiatives are being promoted (see Target 3).

2.5.4 Target 5 and its implementation

Target 5 of the NBSAP aims at ensuring that 60% of areas under agriculture, aquaculture and forestry in Zimbabwe are by 2020 managed sustainably so as to

safeguard the conservation of biodiversity and sustainable utilization of land. Under this target, nine key activities with associated indicators were identified and proposed for implementation.

2.5.4.1 Promote and support adoption of conservation agriculture, agro-forestry and organic farming

The target for this action was to have at least 60% of smallholder farmers in Zimbabwe practising conservation agriculture, agro-forestry and organic farming. An estimated 300,000 Zimbabwe farmers have adopted conservation agriculture.[47] According to Gukurume et al[48] early predictions that CA would transform smallholder agriculture in Zimbabwe have been sharply contradicted by slow adoption, despite substantial initial support from NGOs. Pedzisa et al[49] found that the adoption of CA is frequently incomplete, with only about 7.4% of smallholder farmers using all practices in one year. Kunzekweguta et al[50] observed that very few farmers in Masvingo Province adopted all CA components and that rates of uptake differed markedly between households. In a recent assessment of CA that used a data set covering 1,623 households in Zimbabwe, Malawi and Mozambique, Mango et al[51] concluded that CA had no significant impact on food security in Zimbabwe; this, they said, was mainly because of the small land areas allocated to CA and the failure to implement the full complement of practices necessary to set off the biophysical process that are expected to drive yield increases.

Historically, the land under organic farming in Zimbabwe has been low (Figure 2.4). According to Willer and Lernoud,[52] 980 ha was under organic agriculture in Zimbabwe in 2015, which was about 0.01% of the land under farming. Although it made up a relatively small area, it was a substantial increase from 374 ha and 474 ha under organic agriculture in 2013 and 2014.

2.5.4.2 Establish soil conservation works on farms

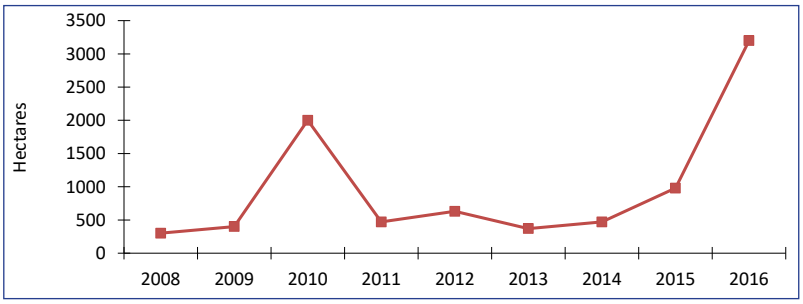
One of the aims under Target 5 is to have 50% conservation works achieved in all farming areas. Poor farming and the absence of conservation works are some of the main causes of land degradation.[53] A significant portion of farmers face the challenge of low soil fertility, water pollution and significant soil erosion.[54] Soil erosion carries away an average of 1.6 million tonnes of nitrogen, 15.6 million tonnes of organic matter and 0.24 million tonnes of phosphorus every year, and generally arable lands lose about 17.8 million tonnes of soil nutrients each year due to land degradation. The drivers of land degradation in Zimbabwe are deforestation, veld fires, unsustainable farming practices, the propagation of invasive alien species and sand mining. The following programmes have been and are being conducted to address land degradation:

- Global Environment Facility (GEF) support to UNCCD 2018 National Reporting Process – Umbrella II; Hwange-Sanyati biological corridor
- Strengthening biodiversity and ecosystems management and climate-smart landscapes in the mid to lower Zambezi region
- Support to align Zimbabwe's national action programme and reporting process with the UNCCD ten-year strategy
- Sustainable land use planning for integrated land and water management for disaster preparedness and vulnerability reduction in the lower Limpopo basin[55]

2.5.4.3 Identifiy and define key biodiversity areas under threat

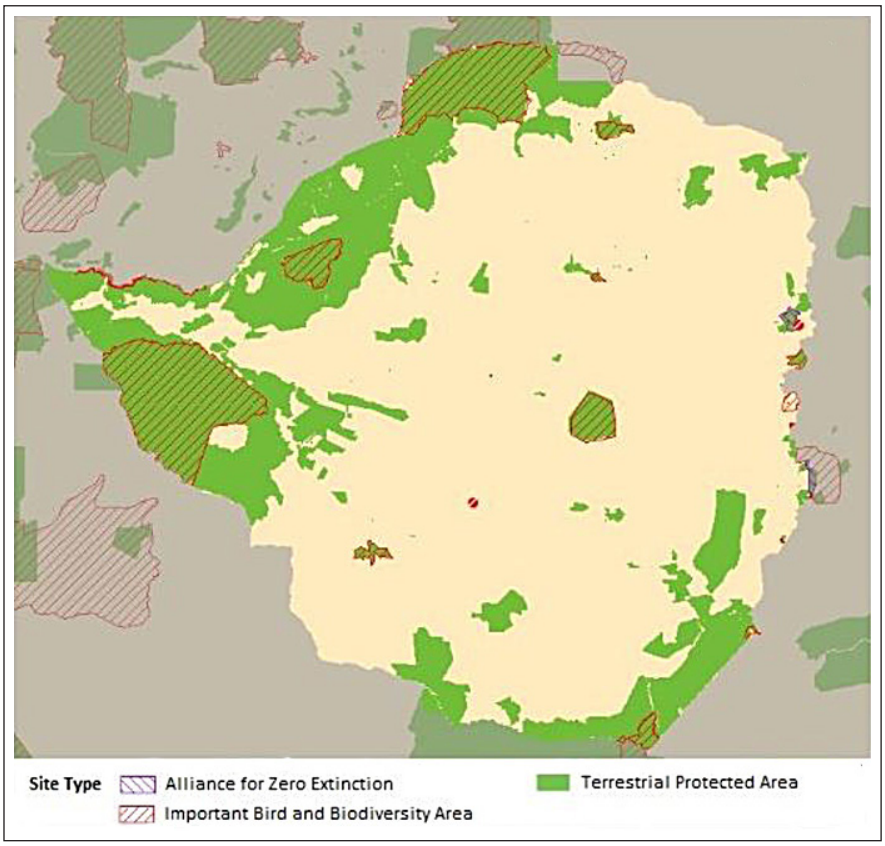
In 2016, the global conservation community agreed on a method for identifying the most important sites on the planet for the persistence of biodiversity, which are called key biodiversity areas (KBAs). A site qualifies as a KBA if it meets one or more of 11 criteria in five categories: threatened biodiversity; geographically restricted biodiversity; ecological integrity; biological processes; and irreplaceability.[56] The sites are further classified as important bird and biodiversity areas (IBA) or Alliance for Zero Extinction (AZE) sites. Twenty sites in Zimbabwe have been identified as KBAs (Figure 2.14 and Table 2, Target 5). AZE was established in 2005 to identify, effectively conserve and safeguard the most important sites for preventing global species extinctions.[57] There are 853 AZE sites worldwide, two of which are the Chimanimani and Nyanga mountains. In Zimbabwe, an average 86% of each terrestrial KBA is covered by protected areas, while 79% and 87% of freshwater and mountain KBAs respectively are covered by protected areas.[58]

Figure 2. 4 Land area under organic farming in Zimbabwe



Source: www.fao.org/fishery

Figure 2.5 Map showing the overlap between key biodiversity areas and protected areas in Zimbabwe



Source: https://conservation.ibat-alliance.org

Table 2, Target 5: The main threats and threat levels of key biodiversity areas and important bird and biodiversity areas of Zimbabwe

2..5.4.4. Identify important fragile habitats and institute mechanisms to conserve them

Most KBAs in Zimbabwe are in protected areas and are therefore afforded some level of protection from degradation. But of the 20 KBAs, the conservation actions that have been taken to conserve eight of the sites are low-level, with only two having high-level conservation actions (Table 3, Target 5). Driefontein grassland and Lake Chivero Recreational Park (formerly Robert McIlwaine Recreational Park) are classified as being in danger as they are under great pressure.[59] The latter is threatened by large amounts of sewage effluent from Harare and Chitungwiza that finds its way into the lake: the water has become eutrophic and infestation by water hyacinth (*Eichornia crassipes*) is near-permanent. The main threats to Driefontein grasslands are agricultural expansion and intensification, human intrusions and disturbance, increases in fire frequency and intensity, as well as climate change and frequent droughts.

Table 3, Target 5: Conservation actions taken at KBAs in Zimbabwe

2.5.4.5 Conduct ecological monitoring

Target 5 proposed ecological monitoring with annual status reports on key species and biodiversity areas. Although assessing the status of key species annually was ambitious, especially considering the resource constraints Zimbabwe has faced over the last two decades, monitoring of the status of a number of species has continued. Fifty-seven plant and 54 animal species have been classified as being vulnerable, endangered or critically endangered. Population trends of 13 of the 57 plant species and of 10 animal species are unknown.

2.5.4.6 Promote and support holistic rangeland management

The following programmes have addressed and continue to address land degradation and rangeland management:

- GEF Support for UNCCD 2018 National Reporting Process – Umbrella II
- The Hwange-Sanyati biological corridor project
- Strengthening biodiversity and ecosystems management and climate-smart landscapes in the mid to lower Zambezi
- Support for alignment of Zimbabwe's national action programme and reporting process to the UNCCD 10-year strategy
- Sustainable land use planning for integrated land and water management for disaster preparedness and vulnerability reduction in the lower Limpopo basin

- The projects under the Zimbabwe Resilience Building Fund

The Africa Centre for Holistic Management has been practising holistic land and livestock management and providing training and learning programmes in holistic resource management on the 3,200 ha Dimbangombe Ranch near Victoria Falls.[60]

2.5.4.7 Integrate biodiversity management with agricultural development programmes, including Comprehensive Africa Agricultural Development Programme

The integration of biodiversity management with agricultural development programmes was one of the actions proposed for Target 5, and the main indicator was to have at least one national-level agricultural programme incorporating agro-biodiversity conservation by the Crop Breeding Institute (CBI) of the Department of Research and Specialist Services. The CBI has a mandate to work on the following crop varieties: maize (*Zea mays*), wheat (*Triticum aestivu*m), groundnut (*Arachis hypogea*), soybean (*Glycine max*), sunflower (*Helianthus annuus*), cowpea (*Vigna unguiculata*), rice (*Oryzae sativum*), common bean (*Phaseolus vulgaris L.*), sorghum (*Sorghum bicolor*), finger millet (*Eleusine coracana*), pearl millet (*Pennizetum glaucum*), potato (*Solanum tiberosum*) and Bambara nut (*Vigna subterranean*).[61] The CBI, the Community Technology Development Organization (CTDO), which works in 21 districts, and other stakeholders have an ongoing agro-biodiversity programme that promotes and undertakes activities such as crop diversity measurements, seed source and diversity analysis and the construction of community seed banks[62] (see Target 11, section 2.11.6).

2.5.4.8 Use spatial data analysis to establish the land under agriculture, aquaculture and forestry as a baseline and monitor area under sustainable development

Spatial data analysis is widely practised in Zimbabwe. For example, the Scientific and Industrial Research and Development Centre has the Geo-Info and Remote Sensing Institute (GRSI), whose goal is to contribute to sustainable environmental resource utilization in Zimbabwe and the region.[63] The objective of GRSI is to provide spatial data analysis solutions that result in the management of the environment and natural resources in a more sustainable manner than would be possible without considering the spatial aspects. Some of the projects of the GRSI are:

- 2.5.4.9 Monitoring the effects of community soil and water management technology on agricultural production using satellite remote sensing
- Design of a geographic information system (GIS) database consisting of natural resources, socio-economic and infrastructure data for the Pungwe-Mutare water supply to be used in a detailed environmental impact assessment
- Formulating a methodology for monitoring vegetation changes, Vegetation Resources Information System (VegRIS), for the Forestry Commission, and to integrate this in land use planning. The system uses GIS, remote sensing (RS) and global positioning system (GPS) techniques for the establishment of a woody cover map series of Zimbabwe
- Groundwater potential mapping and on-farm resources database for Debshan/De Beers

In July 2018, the Ministry of Higher and Tertiary Education, Science and Technology Development established the Zimbabwe National Geospatial and Space Agency (ZINGSA). Some of the proposed activities of the ZINGSA are to: implement research on fertilizer requirements for different soil types; revise agro-ecological zones of Zimbabwe; produce a solar potential map for Zimbabwe; develop malaria and bilharzia prevalence maps; and develop geodatabases for farms.

2.5.4.9 Use value addition and beneficiation opportunities to promote sustainable management of forests

The government has through both ZimAsset and the TSP reforms agenda promoted the concept of value addition and beneficiation, which is also being applied to forest management across the country. The indicator for this component of Target 5 was to have at least two agro- and natural biodiversity processing centres established in each province. WWF is promoting a forest-based incentive system involving bee-keeping through a sustainable forest management project in the communal areas of Hurungwe district, Mashonaland West: enhancing honey production and productivity; supporting the development and implementation of local-level forest by-laws; and supporting the development and implementation of community-level forest management plans.[64] An integrated food, nutrition and income security programme (FNI) that is coordinated by SNV Netherlands Development Organisation aims to improve smallholder farmer productivity for food nutrition and income, developing and implementing diversified and appropriate value chains, and increasing production and consumption of nutritious food for smallholder households in Binga and Hwange districts.[65] Under the FNI programme, 6,000 smallholder farmers are actively engaged in at least one of four viable and appropriate value chains; 15,000 farmers have gained access to and utilize marketing Infrastructure and information systems; and 17,000 households have enhanced their food and nutritional security through diversified food and income sources.

2.5.5 Effectiveness of the implementation measures for Target 5

The measures that have been implemented for Target 5 have been partly effective. Programmes promoting holistic rangeland management in south-western Zimbabwe, as well as those that enhance agro-biodiversi-

ty conservation and processing among smallholder farmers across the country have been supported. Although conservation agriculture has been promoted by government and NGOs, adoption and use of all the required practices by smallholder farmers have been slow. Among the 20 KBAs in the country, the results of conservation measures implemented scored high for only two sites, while five sites scored medium and eight scored low.

2.5.6. Obstacles encountered in implementation of Target 5

The economic crisis in Zimbabwe over the last decade has been the major impediment towards the implementation of Target 5. This has led to limited investment in human capital, resources and infrastructure.

2.5.7 Scientific and technical needs to achieve Target 5: Investment in human capital and resources for monitoring and data collection is required for full and effective implementation of Target 5.

TARGET 6: By 2020, integrated pollution prevention and control strategies are in place to reduce detrimental effects to ecosystem function and biodiversity

Table 1, Target 6 shows the strategy and eight actions that were proposed for prevention and control of detrimental effects of pollution on ecosystem function and biodiversity.

2.6.1 Zimbabwe environmental quality and performance

The Environmental Performance Index (EPI) ranks countries' performance on priority environmental issues in two areas: protection of human health and protection of ecosystems.[66] It scores national performance in nine issue areas comprising more than 20 indicators. The EPI indicators measure country proximity to meeting internationally established targets or, in the absence of agreed targets, how nations compare to one another.1 The 2018 EPI for Zimbabwe was 43.41 out of a maximum score of 100, and the country was ranked 149 out of 180 countries.[67] In 2014, the EPI scores and ranking were 49.54 and 94, and in 2016 they were 59.25, and 129.[68],[69] Zimbabwe's environmental performance for 2018 dropped considerably compared to 2014 and 2016. A summary of the 2018 environmental performance profile for Zimbabwe is shown in Table 2, Target 6. The overall performance of the country was quite low in both environmental health and ecosystem vitality.

Table 1, Target 6: The strategy, actions and indicators for Target 5 and summary comments on progress on implementation

Table 2, Target 6: Zimbabwe's Environmental Performance Profile for 2018

2.6.2 Target 6 and its implementation

The aim of Target 6 was to enhance integrated pollution prevention and control strategies so as to reduce the detrimental effects of pollution on ecosystem function and biodiversity. Eight key actions were identified for implementation.

2.6.2.1 Monitoring and enforcement of national quality standards for water, air and solid waste

The Environmental Management Agency (EMA) is tasked with monitoring of national quality standards for water, air and solid waste.

Air quality

In its third national communications to the UNFCCC, Zimbabwe identified climate change, air quality and ozone layer depletion as major environmental threats to the country's development.[70] Zimbabwe's 2018 EPI score for air quality was 53.52 compared to the 2014 EPI score of 78 (Table 2, Target 6).

Particulate matter less than or equal to 2.5 μm in aerodynamic diameter (or PM2.5) is often measured as an indicator of ambient (outdoor) pollution levels. The World Health Organization air quality guidelines for PM2.5 are 10μg/m3 for long-term exposures (annual mean concentrations) and 25μg/m3 for short-term exposures (24-hour mean concentrations). Zimbabwe's concentrations of PM2.5 in 2016 were in the range 25 to < 30 μg/m3 and the annual mean concentration was 25μg/m3 (Figure 2.6). The country's mean annual population-weighted PM2.5 has been greater than 20 μg/m3 but less than 30 μg/m3 since 1990.

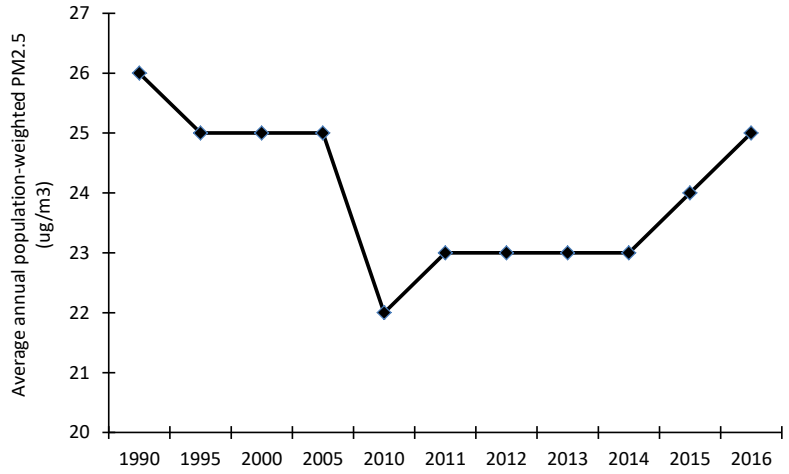
Ozone (O3) at ground level can be detrimental to health, and is especially harmful during hot days. [71] High concentrations of O3 during growing seasons can significantly reduce global crop yields. Globally, it is estimated that 4-15% of wheat yields, 3-4% of rice yields, 2-5% of maize yields and 5-15% of soybean yields are lost to O3 pollution.[72], [73] Ozone concentrations averaged over the summer season, when ozone levels tend to be highest, are usually used to represent the exposures experienced by human populations. The WHO air quality guideline for ozone is 100 μg/m3 (daily maximum eight-hour mean). Ozone concentration in Zimbabwe has gradually increased since 1990 (Figure 2.7).

Air pollution

Air pollutants impair ecosystem integrity and function. The two indicators used for air pollution in formulating the EPI score, sulphur oxides (SOX) and nitrogen oxides (NOX), can both cause acidification, which can degrade soil and water quality. Excessive NOX can also cause eutrophication of aquatic systems and a reduction in biodiversity.[74]

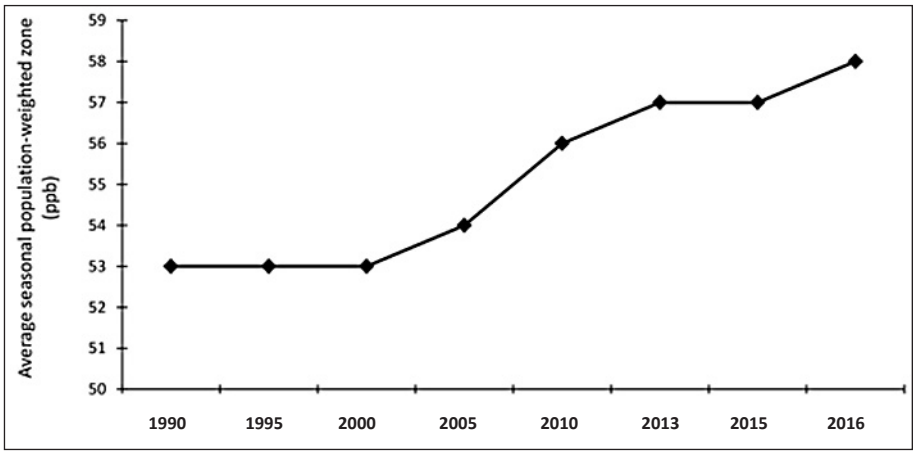
In 2018, Zimbabwe recorded a low EPI score of 8.21 for air pollution and this was drastic decline from

Figure 2. 6 Trend in average annual population-weighted PM2.5 concentrations in Zimbabwe



Source: State of Global Air: www.stateofglobalair.org

Figure 2. 7 Average seasonal population-weighted ozone concentrations in Zimbabwe



Source: State of Global Air: www.stateofglobalair.org

a high EPI score of 100 in 2014 (Table 2, Target 6). NOX emissions in Zimbabwe gradually decreased from 1999 to 2008, while SOX gradually decreased from 1991 to 2008. Since then, however, emissions of both have been on an upward trend (Figure 2.20).

Water resources quality

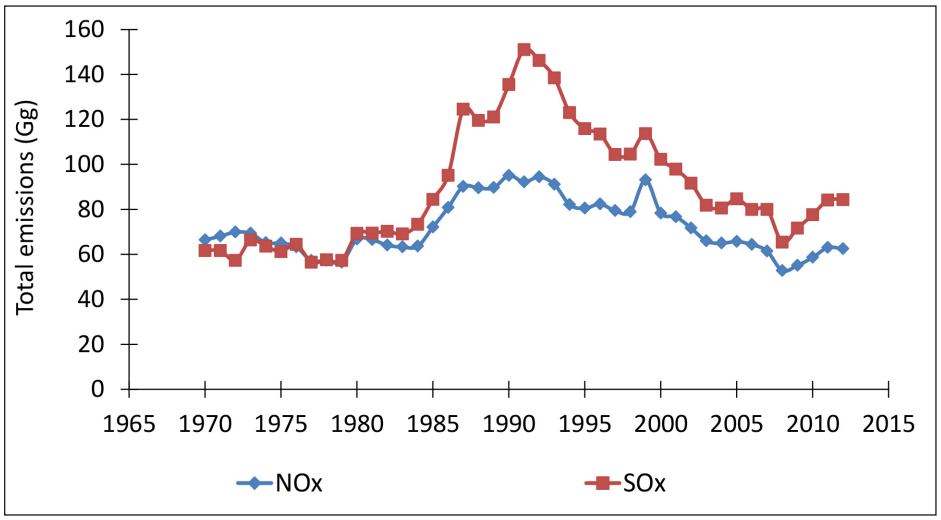
Although water pollution around urban centres such as Harare and Bulawayo and in the vicinity of artisanal mining operations is quite high, water resources status across much of Zimbabwe is relatively good. In 2018, Zimbabwe was ranked 76 out of 180, and had a relatively high EPI score of 75.44 with regard to water resources. The country scored high on the proportion of water bodies, with good ambient water quality. The degree of integrated water resources management implementation and the proportion of transboundary river and lake basins with an operational arrangement for water cooperation were relatively high (Table 4, Target 6). The level of water stress across the country was also relatively low.

Table 4, Target 6: Water quality status

Solid waste

Waste management is a serious environmental challenge throughout Zimbabwe, with most cities, towns and rural service centres characterized by litter and illegal solid waste dumps on street corners and along sanitary lanes. In urban areas, waste management has become a serious environmental and public health concern. According to Practical Action Southern Africa,[75] more than 2.5 million tonnes of household and industrial waste are produced annually in urban areas across Zimbabwe, but refuse collection in urban areas is erratic and most of it remains uncollected. Municipal solid waste management across Zimbabwe is therefore generally poor. For example, municipal solid waste collection coverage for Harare in 2015 was

Figure 2. 8 Total NOx and SOx emissions for Zimbabwe 1970 to 2012



Source: Emissions Database for Global Atmospheric Research: http://edgar.jrc.ec.europa.eu/

only 22.6%. In 2015, EMA carried-out 5,433 solid waste management inspections and issued 1,237 tickets.[76] A total of 139 environmental protection orders were served for the removal of illegal dumps, resulting in 920m³ out of the identified 1300m³ of waste on illegal dumps being removed in and around Harare. A total of 206 illegal dumps with an approximate volume of 1,300 cubic metres were mapped countrywide. The agency received and processed 208 applications for licences. In 2016, the EMA issued 35 orders to local authorities, and 25 were complied with, resulting in the clearance of 597 illegal solid waste dumps in Harare, Chitungwiza, Marondera, Bulawayo and Gweru.[77] However, the dumps continued to resurface and there is need to institute measures to ensure sustainability of the clearing and non-recurrence of the dumps.

Hazardous waste monitoring

In an effort to minimize the environmental danger from handling, storage and transportation of hazardous substances, EMA in 2015 conducted 73,388 inspections, which resulted in the issuance of 637 tickets and the serving of 115 environmental protection orders. Twenty-three hazardous substance spillages were recorded, resulting in the contamination of 21,318.5m²; EMA supervised the decontamination. In 2016, 42,725 inspections were conducted, resulting in the issuance of 691 tickets and 72 environmental protection orders. The number of hazardous substances increased, as did waste licence applications and licences, and approximately 200% more licences were issued in 2015 than in 2010 (Figure 2.9). This was probably due to an increase by EMA in monitoring levels and application of regulations.

Hazardous waste: compliance with international commitments

As of 2015, Zimbabwe was fully compliant with the Montreal Protocol, but only 16.67% compliant with the Basel Convention, and 50.98% and 33.33% compliant with Rotterdam and Stockholm conventions respectively (Table 5, Target 6). The Montreal Protocol aims at eliminating use of ozone-depleting substances such as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) and hydrofluorocarbons (HFCs).

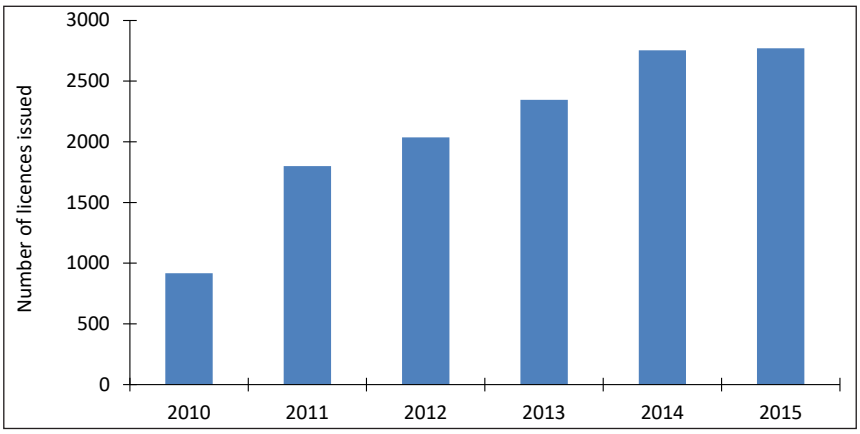
Table 5, Target 6: Hazardous waste compliance in 2015

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal seeks to reduce hazardous waste generation and to restrict and regulate transboundary movements of hazardous waste except where it is perceived to be in accordance with the principles of environmentally sound management. The Rotterdam Convention seeks to promote shared responsibility and cooperative efforts in the international trade of certain hazardous chemicals such as pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons. The Stockholm Convention aims at protecting life and the environment from persistent organic pollutants (POPs).

2.6.2.2 Review of environmental fines and mechanisms for enforcement

EMA regularly reviews environmental fines. Small-scale mining is widespread in Zimbabwe, and previously most small-scale miners operated without environmental impact assessment certificates in violation of the law. This was because they lacked the funds to undertake the EIA process and understanding of the many requirements of the EIA process.[78] EMA has reviewed the EIA process and developed simplified guidelines for small-scale miners in line with provisions of the Environmental Management Act CAP 20:27 of 2002.

Figure 2. 9 The number of hazardous substances and waste licences issued from 2010 to 2015



Source: EMA

2.6.2.3 Upgrade of waste dump sites in line with Statutory Instrument (SI) 16 of 2007

EMA is working with the major urban centres to ensure that dump sites are upgraded.

2.6.2.4 Promote the recycling of waste

EMA, through its environmental planning and monitoring unit and in line with its initiative to protect the environment as well as enhance livelihood options to communities, has been promoting the establishment of community-based organisations (CBOs). EMA also has a directory of 47 commercial recycling companies that process a variety of waste, including low-density polyethylene, high-density polyethylene, polyethylene terephthalate, paper, glass, metal cans and used batteries.[79]

2.6.2.5 Promote and support alternative uses for solid waste, such as biogas production

National domestic biogas programme[80]

This is a collaborative programme, which involves the EMA, Ministry of Energy and Power Development, Ministry of Agriculture, Mechanisation and Irrigation Development, the Renewable Energy Fund and SNV Netherlands Development Organisation. The programme promotes biogas in order to provide access to alternative and clean energy for cooking, lighting and other productive uses. The aim is to improve lives, increase incomes of rural households, contribute to sustainable waste management and nutrient recycling, and reduce felling of trees. Implementation began in January 2013 and the programme has led to greater uptake of biogas digesters across Zimbabwe. Some of its results are:

- More than 70 biogas masons and 18 fabricators have been trained to carry out the installation of biogas plants
- Cooking and lighting with biogas have adopted by 1,385 rural households

New appliances coming on to the market that operate with biogas are being tested, including refrigerators, rice cookers, geysers and heaters, and will help to change the lives of women in particular

2.6.2.6 Promote increased consumer consciousness and demand for environmentally sustainable production and services

Although Zimbabwe has a number of programmes and initiatives to raise awareness about environmental issues, there has been no nationwide attempt to assess the effectiveness of the programmes, especially in consumer consciousness and demand for environmentally sustainable production and services.

2.6.2.7 Undertake measures to ensure environmental impact assessments are effective

EMA does periodic reviews to ensure effectiveness of EIAs. In December 2015, for example, it reduced fees for all prescribed projects in an effort to promote the ease of doing business and balance environmental, economic and social components for sustainable investment and development.[81]

2.6.2.8 Conduct assessment of the extent of impact of chemical use on water bodies

This proposal is yet to be taken up.

2.6.3 Effectiveness of the implementation measures for Target 6

The measures that have implemented for Target 6 have been partly effective. The quality of water resources across the country has been high, while air quality decreased from 2014 to 2018. Solid waste management remains inadequate.

2.6.4 Obstacles encountered in implementation of Target 6

- The economic decline in Zimbabwe over the last decade has been the main obstacle in the

implementation of Target 6. Investment in infrastructure and equipment for pollution monitoring and prevention – especially the purchase and maintenance of equipment – has been inadequate
- Not enough funding has available for human capacity building in monitoring and control of pollution and assessment of its effects on ecosystem function and biodiversity

2.6.5 Scientific and technical needs to achieve Target 6

- Institutions conducting environmental monitoring have generally struggled to buy and maintain equipment, and in many instances the equipment is broken or obsolete. To achieve Target 6, it will be necessary to invest in upgrading of laboratory equipment of institutions such as EMA, ZINWA and universities
- Training in monitoring and control of pollution as well as the evaluation of impacts on ecosystem function and biodiversity

TARGET 7: By 2020, the threats to biodiversity from invasive alien species have been assessed and measures put in place to control and manage their impact

2.7.1 Non-native and alien species in Zimbabwe

More than 150 alien plant and animal species have been introduced and recorded in Zimbabwe. The status of many of these species is not known but about 10 have been classified as invasive and many others do have the potential to become invasive. NBSAP2 has four actions that were developed for the control and management of invasive alien species (Table 1, Target 7). Thirteen species were identified as requiring monitoring, among which are *Acacia mearnsii* (black wattle), *Acridotheres tristis* (Indian myna), *Eichornia crassipes* (water hyacinth) and *Lantana camara,* which are listed among the 100 of the world's worst invasive species. Twenty-nine species listed among the 100 of the world's worst IAS have been recorded in Zimbabwe. Table 2, Target 7 and Table 3, Target 7 give summaries of the status of seven plant species and six animal species that were listed for monitoring in NBSAP2. Figure 2.10 shows the distribution of some of the invasive plant species, which include *L. camara, Opuntia spp, E. crassipes, Dichapetalum cymosum* (*umkhawuzane*), and *Tithonia rotundifolia*, an ornamental shrub.

Table 1, Target 7: The strategy, actions and indicators for Target 7 and summary comments on progress on implementation

2.7.2 Target 7 and its implementation

EMA, the Forestry Commission, Plant Quarantine Services in the DRSS and the National Herbarium are among the institutions involved in monitoring invasive alien species in Zimbabwe. Target 7 proposes the development and implementation of management plans for control of priority IAS. Among the 12 species identified for monitoring in NBSAP2, the monitoring, control and eradication of invasive species at national level has largely focused on *L. camara* and *O. fulgida.* The distributions of the two species were mapped (Figure 2.23) and monitoring and control strategies initiated. There are signs of success on control and eradication of *O. fulgida*, as the species has largely been eradicated from most areas in Matebeland South, which was the centre of infestation. *L. camara* has recently been reported as being a threat to the Great Zimbabwe World Heritage Site.[82]

EMA has personnel at border posts to prevent the entry of new IAS in the country, although its activities are hampered by resource limitations. Among established IAS, the Nile tilapia (*O. niloticus*) is being actively promoted and spread throughout much of the country's dams in support of fisheries and aquaculture. The status and potential impacts of most alien species in the country are still to be assessed. Target 7 also proposes the updating of the schedule of IAS and development of a policy on IAS, which are still to be done.

There is need to quantify the extent of invasiveness of other alien species through systematic studies and ecological niche modelling, to determine their environmental, ecological, social and economic effects, and then, if necessary, formulate a policy and action plans to combat the spread of potential IAS.

2.7.3 Effectiveness of the implementation measures for Target 7

The measures implemented for Target 7 have been partly effective. The distribution and abundance of some invasive species have been assessed and control measures carried out, especially for *L. camara* and *Opuntia* spp. Although the spread of *Opuntia* has been brought under control, *L. camara* is still problematic. There is need to assess the spread and impacts of other non-native invasive species.

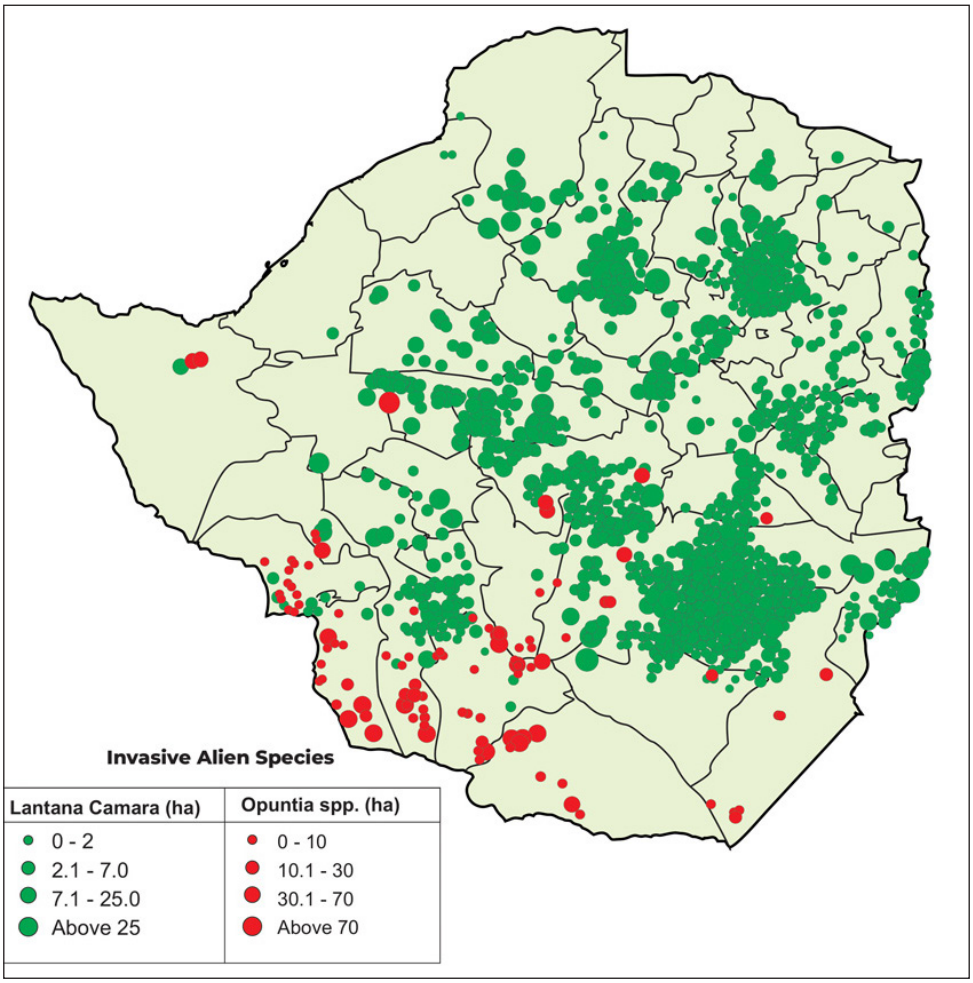
2.7.4 Obstacles encountered in implementation of Target 7

- Lmited expertise in taxonomy in Zimbabwe, particularly for taxa such as insects and other invertebrates, fungi, bacteria and grasses, which hinders work on identification and classification of organisms, and in the prevention of further invasions and emerging threats from IAS
- The lack of equipment for taxonomic work

2.7.5 Scientific and technical needs to achieve Target 7

- Training of taxonomists in all major fields of taxonomy
- Training in the use of tools such as environ-

Figure 2. 10 The distribution of *Lantana camara*, *Opuntia fulgida* (*Opuntia* spp) and five other invasive species in Zimbabwe



Source: EMA

mental DNA (eDNA) for rapid assessment of the distribution and abundance of IAS

- Provision of the necessary equipment and resources
- Development of an information hub for non-native species in Zimbabwe that covers identification tools and information on impacts, control and eradication measures

TARGET 8: By 2020, adaptation and mitigation strategies are implemented to reduce the impact of climate change on vulnerable ecosystems and communities

Target 8 aims at reducing the impact of climate change on vulnerable ecosystems and communities through implementation of adaptation and mitigation strategies. The target has disaster risk reduction as its main strategy, and nine actions for implementation (Table 1, Target 8).

2.8.1 Zimbabwe's disaster risk profile

Zimbabwe experiences a combination of natural and man-made risks, including drought and floods, crop pests and diseases and animal disease outbreaks. Floods are common in low-lying areas in the Zambezi region, and southern Zimbabwe frequently suffers droughts and dry spells that severely reduce crop yields. Climate change has induced increasingly erratic rainfall which, combined with limited adaptive capacities, has resulted in peaks in food insecurity every four to five years. Exposure to natural hazards is compounded by endemic poverty. Underlying risk drivers include rapid unplanned urbanization, construction on wetland areas, land degradation and deforestation.

The Index for Risk Management (INFORM) is a risk assessment tool for humanitarian crises and disasters.[83] INFORM has three dimensions: hazard and exposure, vulnerability and lack of coping capacity. The dimensions encompass different categories, which are user-driven concepts related to the needs of humanitarian and resilience actors. The INFORM index values and those of its composite indicators have an identical range of 0.0-10.0 with the notion that higher is worse.[84] Zimbabwe's INFORM score for 2018 was 5.2, which was in the high disaster risk category and ranked the country 38 out of 191, which is among the top quarter of high disaster risk countries (Table 2, Target 8).

Table 1, Target 8: The strategy, actions and indicators for Target 8 and summary comments on progress on implementation

Table 2, Target 8: The INFORM Risk Index and its three dimensions for Zimbabwe

In 2018, Zimbabwe was in the medium-risk category with regard to hazard and exposure events that could occur and the people or assets potentially affected by them, while risk due to vulnerability and lack of coping capacity was high (Table 2, Target 8). Droughts were the greatest hazard and exposure risk component (Table 3, Target 8). Zimbabwe's economy has shrunk over the last two decades. According to the World Bank,[85] economic growth fell from 1.4% in 2015 to 0.7% in 2016, continuing the recent decline in per capita income growth. Slow economic growth has disproportionately affected poor households, especially in the rural areas, which are home to at least two-thirds of Zimbabwe's population, including 79% of the poor and 92% of the extremely poor.85 Vulnerability – the susceptibility of people to potential hazards – has therefore been high largely due to the country's diminished economic performance.

Table 3, Target 8: Risk dimensions and components for Zimbabwe

Lack of coping capacity measures the ability of a country to cope with disasters in terms of formal, organized activities, and the efforts of its government and the existing infrastructure that contribute to the reduction of disaster risk.[86] Zimbabwe's high-risk value for lack of coping capacity was due to high-risk scores for governance – that is, government effectiveness in the quality of policy formulation and implementation and the credibility of its commitment to such policies, and Corruption Perception Index – and infrastructure (communication, access to health system and physical infrastructure) (Table 3, Target 8).

Due to high levels of both vulnerability and lack of coping capacity, Zimbabwe has since 2012 been classified as high risk with regard to human crises and disasters. There was a decrease in the INFORM index for Zimbabwe from 2012 to 2018, suggesting an improvement in risk management, although there was essentially no change in hazard and exposure (Figure 2.11).

2.8.2 Zimbabwe's disaster risk management

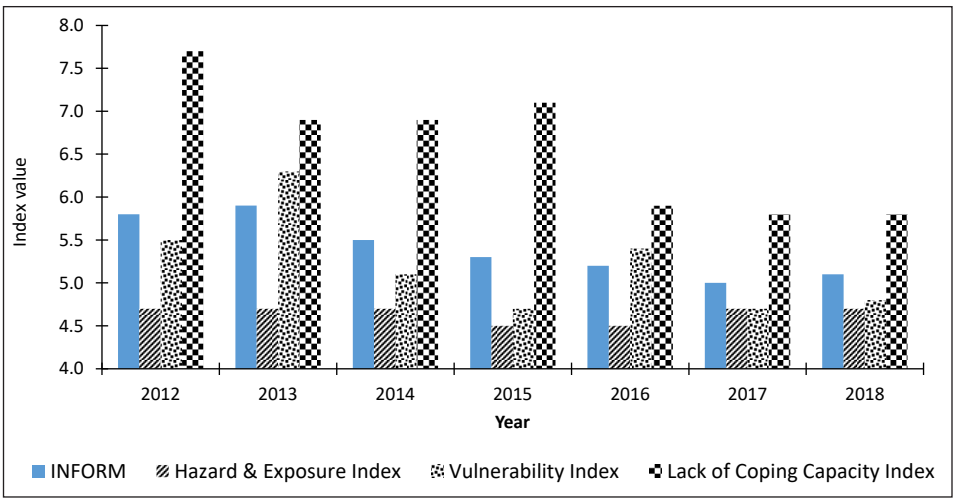
The Civil Protection Act [Chapter 10:06] provides for the operation of civil protection services in times of disaster and the establishment of a fund to finance civil protection, and for matters connected with or incidental to them. The Ministry of Local Government, Public Works and National Housing through the Department of Civil Protection coordinates all stakeholders involved in disaster risk management (DRM) and promotes preparedness planning, prompt emergency response, early recovery and rehabilitation. According to a Capacity for Disaster Reduction Initiative assessment, the DRM system of Zimbabwe is mainly focused on civil protection and emergency management rather than on a holistic approach.[87] A process has begun to review the legislation since 1995 in an effort to strengthen disaster risk reduction. A draft DRM Bill was produced in 2004 with the intention of updating and eventually repealing the Civil Protection Act, and work is under way to draft appropriate legislation.

Target 8 and its implementation

2.8.3 Incorporation of biodiversity conservation action into the national disaster risk reduction strategy

Zimbabwe is still to develop a national disaster risk reduction strategy. Target 8 proposes the incorporation by 2020 of biodiversity conservation action in the national disaster risk reduction strategy, and

Figure 2. 11 The trend in the Index for Risk Management (INFORM) and its three composite dimensions for Zimbabwe from 2012 to 2018



Source: www.inform-index.org/

as an indicator, a biodiversity areas DRM plan. The draft Disaster Risk Management Bill, which recognizes biological hazards (epidemics, pandemics, zoonotic diseases, and other biological threats to the well-being of human beings, wildlife, livestock and plants) needs to incorporate biodiversity and ecosystems in disaster risk reduction.

2.8.4 Effectiveness of the implementation measures for Target 8

The measures implemented for Target 8 have been partly effective. A number of programmes promoting ecosystem-based adaptation and mitigation have been implemented and heat-tolerant plant varieties and drought-tolerant animal breeds have been widely promoted. ZPWMA and other stakeholders have strengthened measures to reduce poaching in protected areas.

2.8.5 Obstacles encountered in implementation of Target 8 and the scientific and technical needs to achieve the target

The economic challenges in Zimbabwe over the last decade and the resultant high levels of unemployment and poverty, particularly the much higher levels of poverty in the rural areas, have hindered the effective implementation of Target 8. Environmental resources make a significant contribution to average rural incomes. Poorer households are heavily dependent on these resources, which contribute as much as 40% to their incomes.[88] Generally, the poorer the population, the more significant the role of natural capital in determining poverty outcomes. According to Masron and Subramaniam,[89] poverty is among the principal sources of environmental damage in developing countries, and efforts to reduce environmental degradation must be comprehensive enough and environmental policies must prioritize poverty reduction. Because environmental degradation results in declining ecosystem services on which they depend, resulting in further loss of livelihoods, poor households are prone to a poverty-environment trap.[90] Thus poverty is a key factor that increases the propensity for individuals and households to be harmed by climate shocks and stresses.[91] Enhanced support for poverty reduction programmes across the country is therefore needed in order to achieve the target.

TARGET 9: By 2020, at least 28% of Zimbabwe's terrestrial and inland water under protection is maintained and conserved, and protected area connectivity enhanced through integrated resource management

Target 9 focuses on the protected areas (PAs) network of Zimbabwe. It has two strategies, five activities and six indicators (Table 1, Target 9).

2.9.1 Protected areas network extent in Zimbabwe

The protected areas network of Zimbabwe (Figure 1.2) comprises 232 sites which cover 106,837 km2 or 27.2% of the country's total land area[92] (see section 1.2.2).

2.9.2 Protected area representativeness and connectedness in Zimbabwe

The Protected Area Representativeness Index for Zimbabwe was 0.173 in 2016. There was a rapid increase in biodiversity protection between 1970 and 2000 which saw the index rising from 0.059 to 0.12 (Figure 2.12). From 2000 to 2016, the index changed at a much slower annual rate of 0.0231/year.

The Protected Area Connectedness Index for Zimbabwe was 0.5166 in 2012 compared to 0.4589 in 2000 (Figure 2.13). The index changed at an annual rate of 0.01/year from 2000 to 2012. Thus, there has been a gradual though slight increase in connectedness among protected areas. Figure 2.14 shows the coverage and connectivity of protected areas in Zimbabwe. The protected areas network can be broadly separated into two major components. The one stretches from north-east through the north, and all the way to the north-western and the western part of the country. This near-contiguous portion comprises Dande, Chewore, Sapi, Mana Pools, Charara, Matusadona, Chete, Chizarira, Chirisa, Victoria Falls, Matetsi, Kazuma and Hwange National Park (Figures 1.2 and 1.3). The other stretches from the south-east to the south of the country, with the main part being Gonarezhou National Park.

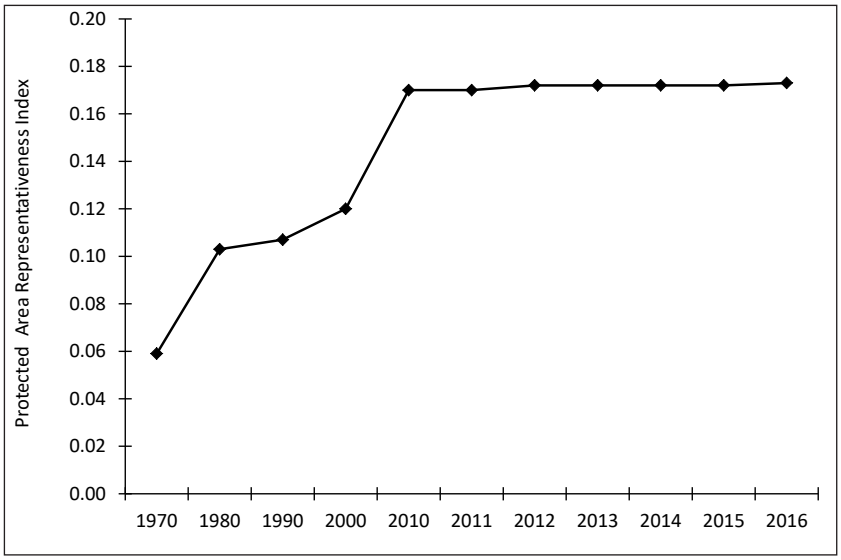
Table 1, Target 9: The strategies, actions and indicators for Target 9 and summary comments on progress on implementation

2.9.3 Effectiveness of management of PAs

Of the 232 protected areas in Zimbabwe, only eight – Chimanimani National Park, Chirinda State Forest, Chizarira National Park, Hwange National Park, Nyanga National Park, Stapleford State Forest, Mosi oa Tunya/Victoria Falls World Heritage Site, Mana Pools National Park and Sapi and Chewore safari areas World Heritage Site – have been assessed for management effectiveness (Table 2, Target 9 to Table 9, Target 9). Threats in most of the PAs are agricultural expansion, human intrusion and disturbance and invasive species. The overall threat level for Hwange National Park was evaluated to be medium to moderate, while the other seven PAs had high levels of threat.

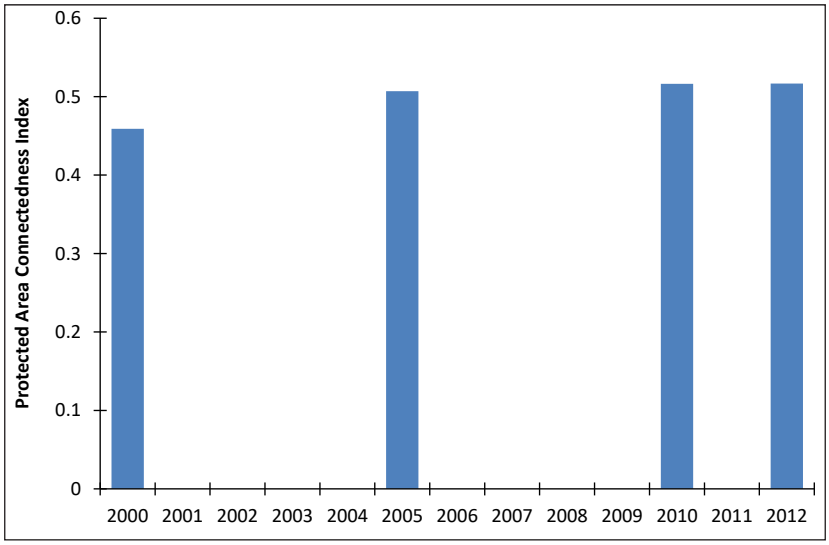
The habitat condition (state) for Nyanga National Park and Stapleford Forest has been evaluated as unfavourable due to invasion by invasive alien plants – Acacia mearnsii (black wattle) and Pinus patula (pine) – and an increase in fire frequency and intensity in the former[93] and agricultural expansion and intensification as well as human intrusions and disturbance in the latter.[94] Although some concern has been raised for the overall protection and management of both the Mosi oa Tunya/Victoria Falls World Heritage Site and Mana Pools National Park and Sapi and Chewore safa-

Figure 2. 12 Trend in Protected Area Representativeness Index for Zimbabwe



Source: Biodiversity Indicators Partnership: http://bipdashboard.natureserve.org/

Figure 2. 13 Change in Protected Area Connectedness Index for Zimbabwe



Source: Biodiversity Indicators Partnership: http://bipdashboard.natureserve.org/

ri areas World Heritage Site, the conservation outlook of the former is good,[95] but there is significant concern for the latter.[96] The significant concern registered in conservation outlook for Mana Pools is a result of potential development of mining activities in the vicinity of the world heritage site and a hydroelectric facility on the Zambezi at Mupata Gorge, which would flood the core of the site and reduce its wildlife carrying capacity by half, as well as the lack of effective monitoring to evaluate and mitigate the effects of human activities in and around the site.

Table 2, Target 9: Management effectiveness assessment of Chimanimani National Park

Table 3, Target 9: Management effectiveness assessment of Chirinda State Forest

Table 4, Target 9: Management effectiveness assessment of Chizarira National Park

Table 5, Target 9: Management effectiveness assessment of Hwange National Park

Table 6, Target 9: Management effectiveness assessment of Nyanga National Park

Table 7, Target 9: Management effectiveness assessment of Stapleford Forest

Table 8, Target 9: Management effectiveness assessment of the Mosi oa Tunya/Victoria Falls World Heritage Site

Table 9, Target 9: Management effectiveness assessment of the Mana Pools National Park and Sapi and Chewore safari areas World Heritage Site

Figure 2. 14 Protected area coverage and connectivity

Source: UN Biodiversity Lab: www.unbiodiversitylab.org

2.9.4 Community conservation areas

Through the CAMPFIRE programme, Zimbabwe has a long history of promoting participation in the management of wildlife by communities who live near protected areas and of ensuring that the communities benefit from the resources. Through CAMPFIRE, the government devolved the authority for wildlife to communities, thus allowing them to manage and market their wildlife, and directly receive benefits from the activities.[97] CAMPFIRE was aimed at giving indigenous communities co-ownership of local natural resources, particularly wildlife, so that they could generate income by leasing trophy hunting concessions, harvesting resources, game cropping and tourism activities.[98], [99] According to Ntuli and Muchapondwa,[100] this goal has not been achieved because authority over natural resources devolved to rural district councils (RDCs) rather than to the communities. Although CAMPFIRE was initially hailed as a success, its performance has according to many declined in the last decade.

The CAMPFIRE programme recently underwent a review which assessed its status and came up with recommendations that are being considered. The main aspects, findings and recommendations of the review centred on devolution, property rights, institutional arrangements, business model and benefit sharing. The review established that one of the main weaknesses of CAMPFIRE has been its lack of effective legal backing as its policies and guidelines are not legally binding and it is not fully aligned with the local government administrative system. Furthermore, rural communities do not own land but only have right of use. Thus, rural communities have no security of tenure over wildlife. The main recommendation of the review is that the Constitution of Zimbabwe and community-based natural resource management (CBNRM) laws be aligned to provide for community environmental and property rights, which should include rights over wildlife and other natural resources. It also recommends enhancing community participation by establishing – and conferring appropriate authority upon –environmental subcommittees made up of community members, and resuscitating and strengthening capacity building of CAMPFIRE stakeholders.

The main business activity in CAMPFIRE is safari hunting, which accounts for 90% of the income; the remaining 10% is from other CBNRM activities such as timber concessions, photographic safaris and sand extraction. Thus, diversification of CBNRM-related income-generating projects is recommended in order to reduce dependency on hunting through the establishment of communal wildlife conservancies and development of public private community partnerships and non-hunting ventures such as community-based tourism, timber, fisheries, beekeeping, crocodile farming, sale of natural products and crafts projects.

With regard to benefit sharing, the review noted that although there are guidelines on how revenue from wildlife management activities is shared, these are not legally enforceable. Communities are therefore unable to hold RDCs accountable for non-compliance with the provisions of the guidelines. According to the original design of the CAMPFIRE programme, income is ideally tabled at an annual meeting of the ward wildlife committee from which the general assembly decides or endorses expenditures or proposed investments. The review shows that this arrangement has broken down as most community members are not aware of the amount of money generated by programmes in their communities or how the money is used. The review recommends enhancing inclusivity, accountability and transparency by strengthening governance systems of wildlife resources to consider all interested and affected parties in CBNRM.

Other aspects addressed by the review are climate change mitigation and adaptation, human and wildlife conflicts, problem animal control and poaching, information management, and international agreements that inform CBNRM. The CAMPFIRE programme has been implemented in arid regions of the country where crop production has little potential and which are expected to be the areas worst affected by climate change. CAMPFIRE has enabled the communities to build resilience and reduce the effects of vulnerability, notably to climate change. Thus, there are a number of lessons in CBNRM and from CAMPFIRE that promote climate change adaptation and mitigation, and the review recommends that government adopt the model for climate change adaptation in order to access climate finance.

With respect to information management, the review noted that there is insufficient data on wildlife management activities in Zimbabwe. It therefore recommended the establishment of a comprehensive and integrated information management system that covers wildlife monitoring and wildlife and tourism income, including economic analysis of CAMPFIRE's local value chain.

Human and wildlife conflicts (HWC), problem animal control (PAC) and poaching are a huge cost in CAMPFIRE areas. The review calls for an HWC management policy which gives direction on possible devolution of PAC responsibility and resources to the local communities, with the State maintaining an oversight role. Also recommended are training of personnel and provision of equipment for anti-poaching activities, and the integration of problem animal management in local environment action plans.

2.9.4.1 Sidinda CAMPFIRE Wildlife Conservancy

One of the outputs under the Hwange-Sanyati biological corridor (HSBC) has been the establishment of a community and private sector safari hunting partnership in the Sidinda ward of Hwange, the Sidinda CAMPFIRE Wildlife Conservancy. The communities in the area received training to enhance capacity to monitor wildlife, to create strong and effective environment sub-committees, and to participate effectively in safari hunting operations. In August 2018, the conservancy received 100 buffaloes from Victoria Falls National Park,[101] and it has been restocked with plains game from Hwange National Park.

2.9.4.2 Mucheni Community Conservancy

The Mucheni Community Conservancy is in Binga district. It is a project site under the sustainable wildlife management programme of the Collaborative Partnership on Sustainable Wildlife Management, a voluntary partnership of four international organizations with substantive mandates and programmes to promote the sustainable use and conservation of wildlife resources.[102] It seeks to promote conservation through the sustainable management of terrestrial vertebrate wildlife, and has four major thematic priorities for its activities: wildlife, food security and livelihoods; human-wildlife conflict; illegal or unsustainable hunting; and partnership coordination and outreach.

2.9.4.3 The Wildlife in Livelihood Development (WILD) Programme[103]

WILD is an initiative of Sustainable Agriculture Technology (SAT) and the Zimbabwe Wildlife Veterinary Trust (ZWVT) and is funded by the European Union. The programme promotes robust, community-led conservation businesses and partnerships with private-sector operators and is aimed at improving socio-economic and ecological resilience in semi-arid communal areas of Zimbabwe. The programme has supported the establishment of three community led wildlife-based land use enterprises in Zimbabwe – Jamanda Wildlife Conservancy, Naivasha Community Conservancy and the Ume River Conservancy.

2.9.4.4 Jamanda Wildlife Conservancy

Jamanda Community Conservancy in Mahenye Communal Land is on the eastern boundary of Gonarezhou National Park. Planning and development were done through Jamanda Community Conservation and Development Trust, which comprised Chief Mahenye and headmen, elected community representatives, Chilo Gorge Lodge, a private operator[104] and representatives from SAT and ZWVT. The Jamanda wilderness area, about 30,000 acres of pristine habitat on the eastern bank of the Save River bordering Gonarezhou National Park, was established as non-utilization, non-cropping conservation preserve in the core of the Mahenye wildlife area. The wilderness area represents diversification of community-led conservation as it is based on a non-consumptive ecotourism model, unlike most of the traditional CAMPFIRE programmes that largely depend on trophy hunting. More than 7,000 ha have been fenced and efforts are being directed towards restocking of wild animals.[105]

2.9.4.5 Naivasha Community Conservancy

Naivasha Community Conservancy, which is still in its early stages, covers more than 100,000 acres and has almost 60 km of open boundary with Gonarezhou National Park (Figure 2.35). The conservancy has enormous untapped wildlife and tourism potential: it has not been settled, resulting in minimal human impact, and is suitable for conservation of several species of conservation importance, including roan and sable antelope, Lichtenstein hartebeest and black and white rhino.[106] Once it is fully operational, with wildlife management, security and basic tourism infrastructure and systems established, the conservancy will provide a reciprocally important buffer to Gonarezhou National Park and local communities on the boundary, having been fenced into the national park.

2.9.4.6 Ume River Community Conservancy

Ume River Conservancy is set on the banks of the Ume River where it flows into Lake Kariba and it borders Matusadona National Park to the east. The conservancy is a partnership between the local community and a private sector tourism and wildlife management operator, African Conservancies Ltd. It was initiated by the community with African Conservancies and Carbon Green Africa, which runs the Kariba REDD+ carbon credit project. The conservancy is part of the Sebungwe region which is home to important populations of elephant and other wildlife that have been under enormous poaching pressure from organized crime gangs in recent years. Lake Kariba is also an important resource, being the centre of the biggest and most lucrative fishing and crocodile industries in Zimbabwe and a renowned recreational destination. Establishing effective management and protection and anti-poaching activities in the Ume River Conservancy is therefore an essential contribution to conservation and sustainable utilization of biodiversity of the Matusadona National Park and broader Sebungwe region.

2.9.4.7 Other community conservancies

Other community conservancies that have come up during the last five years are the Shangani, Senuko, Nyangambe, Ingwizi and Bubiana conservancies. The 40,000 ha Shangani Wildlife Conservancy in Insiza District was officially launched in October 2015.[107]

2.9.5 Target 9 and its implementation

Target 9 proposed conducting annual assessments of the effectiveness of management of PAs in priority biodiversity areas and producing annual assessment reports for each. Eight PAs have so far had management effectiveness assessments, and there is some concern with regard to protection and management of three areas – Nyanga National Park, Stapleford State Forest and Mana Pools National Park and Sapi and Chewore safari areas World Heritage Site. Assessments of management effectiveness of other PAs and regular periodic assessment of each PA are needed.

The target also proposed the development of at least three community conservation areas per district. Although this target cannot realistically be achieved, a number of community conservation areas have been proposed and some have already started. These areas and other initiatives (see sections 2.3.5.5 and 2.12.2.2 to 2.12.2.6) support and promote appropriate land use strategies. Target 9 also proposes the establishment of a unit or office whose mandate will be the coordination of all environmental conventions to advance implementation.

2.9.6 Effectiveness of the implementation measures for Target 9

The measures implemented for achieving Target 9 have been partly effective. The establishment of sustainable wildlife management programmes with the involvement of private partners and local communities has potentially enhanced biodiversity conservation.

2.9.7 Obstacles encountered in implementation of Target 9

Only a few PAs have been assessed for management effectiveness largely due to limited financial, material and human resources.

2.9.8 Scientific and technical needs to achieve Target 9: Training in the assessment of management effectiveness for PAs

TARGET 10: By 2020 the loss of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained

Target 10 has a strategy of conserving and protection of species, and five activities for preventing the loss of threatened species and improving their conservation status (Table 1, Target 10).

2.101 Threatened plant and animal species

According to the IUCN Red List of Threatened Species, 12 plant species in Zimbabwe are endangered and 37 are vulnerable. Among animals, 10 are critically endangered, 14 are endangered and 32 are vulnerable to extinction (Table 2, Target 10). The number of threatened species is relatively high throughout most of the country, especially in protected areas (Figure 2.15).

2.10.2 Endangered plant species

Table 3, Target 10 gives a summary of habitats, population ranges and trends, threats and conservation actions of the 12 endangered plant species in Zimbabwe. Of the 12 listed as endangered, the populations of seven are decreasing, and only one species, *Euphorbia rugosiflora*, has a stable but small and restricted population. Most of the 12 are restricted to the Eastern Highlands.

Table 1, Target 10: The strategy, actions and indicators for Target 10 and summary comments on progress on implementation

Table 2, Target 10: Summary of the IUCN Red List of Threatened Species in Zimbabwe

Table 3, Target 10: Plant species in Zimbabwe that are listed as endangered on the IUCN Red List of threatened species in Zimbabwe

2.10.3 Plant species

Table 4, Target 10 gives a summary on population trends, threats, and conservation actions of the 37 vulnerable plant species in Zimbabwe. The populations of 20 are decreasing and that of only one, Buchnera subglabra , is stable. The population trends of the remaining 16 are either unknown or unspecified. Habitat degradation, agricultural activities and harvesting are the most frequent threats. Twenty-eight of the species are found in a protected area, mostly in Chimanimani National Park.

Table 4, Target 10: Plant species listed as vulnerable on the Red List of Threatened Species in Zimbabwe

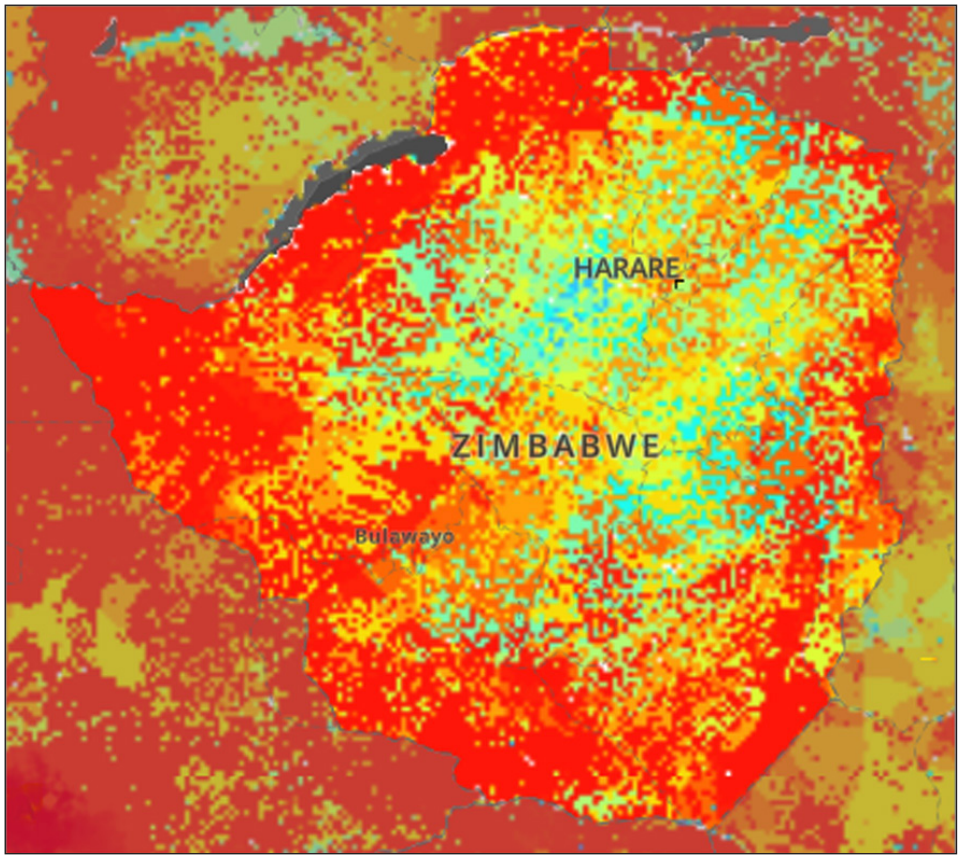
2.10.4 Critically endangered animal species

Table 5, Target 10 gives a summary on habitats, population ranges and trends, threats, and conservation actions of the 10 critically endangered animal species in Zimbabwe. *Oreochromis mortimeri*, the only endemic fish species in the middle Zambezi, occurs in the middle Zambezi River and its tributaries from the Cahora Bassa gorge to the Victoria Falls.[108] The species population has decreased rapidly in Lake Kariba and the Zambezi River and its tributaries since the introduction of the Nile tilapia (*Oreochromis niloticus*).[109],[110]

Most of the rhinos in Zimbabwe, both black and white, are protected in three private conservancies, Save, Bubye and Malilangwe, which together are known as the Lowveld conservancies. At the end of December 2017, these conservancies had 457 black and 284 white rhinos. In 1990, the black rhino population in the three conservancies made up 4% of the total rhino population in Zimbabwe but by December 2017, through the rhino conservation programme, the population had grown to 89% of the national total. There were more black rhinos than white rhinos in 2013 and 2014, but in 2015 the number of black rhinos decreased while that of white rhino increased (Figure 2.16).

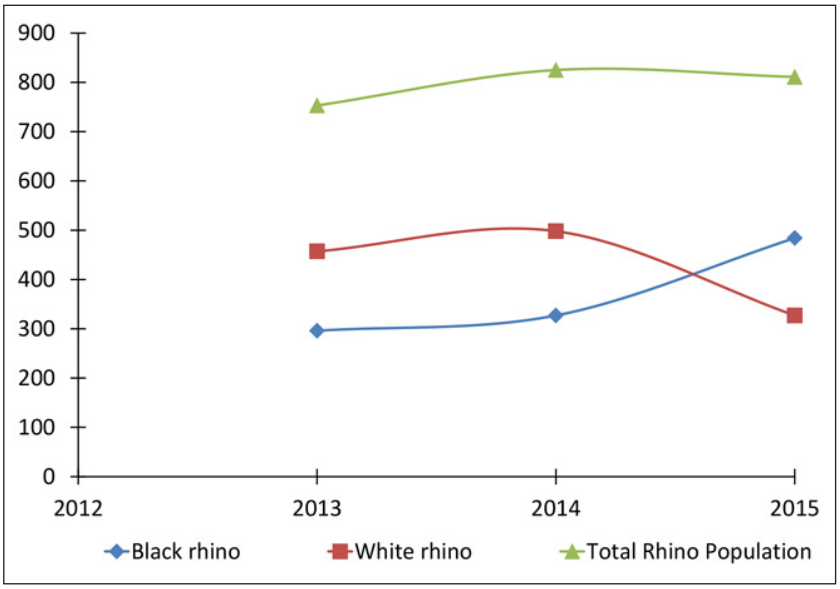
Total rhino population numbers have increased since 1992, although the increases were observed in the Lowveld conservancies (Figure 2.17). From 2002 to 2010, rhino numbers in other areas of the country decreased from about 400 to just over a 100, which coincides with period of rapid economic decline in

Figure 2. 15 Threatened species richness across Zimbabwe



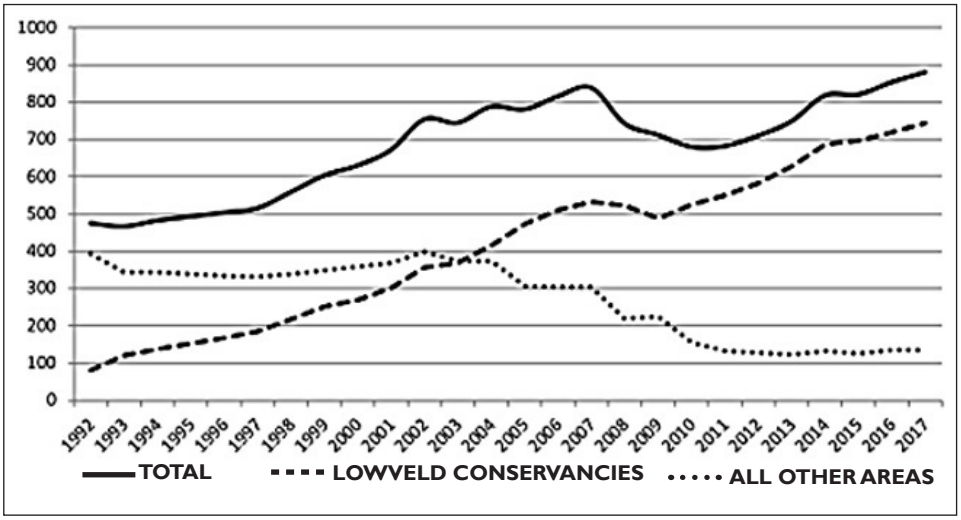
Source: UN Biodiversity Lab: www.unbiodiversitylab.org

Figure 2. 16 Trends in Zimbabwe's rhino population from 2013 to 2015



Source: Lowveld Rhino Trust Zimbabwe: http://lowveldrhinotrust.org/

Figure 2. 17 Trends in Zimbabwe's rhino population, both species



Source: Lowveld Rhino Trust Zimbabwe: http://lowveldrhinotrust.org/

Zimbabwe. The largest threat to rhino in the country is poaching (Figures 2.18 and 2.19). Poaching of rhino reached its peak in 2008 and 2009, which was the worst period of Zimbabwe's economic crisis.

Among the other critically endangered animal species in Zimbabwe, the population trends of two, *A. cuneistigma* (Chimanimani bluet) and *E. lapidaria* (rock threadtail) are unknown and those of four, *S. ayresi* (white-winged flufftail), *G. africanus* (white-backed vulture), *G. rueppelli* (Rüppell's vulture) and *N. monachus* (hooded vulture) are decreasing. *A. troglodytes* (cave squeaker), which was first recorded in 1962 in the Chimanimani mountains and was thought to be extinct, was recorded again in 2017.[111]

Table 5, Target 10: Animal species listed as critically endangered on the Red List of Threatened Species in Zimbabwe

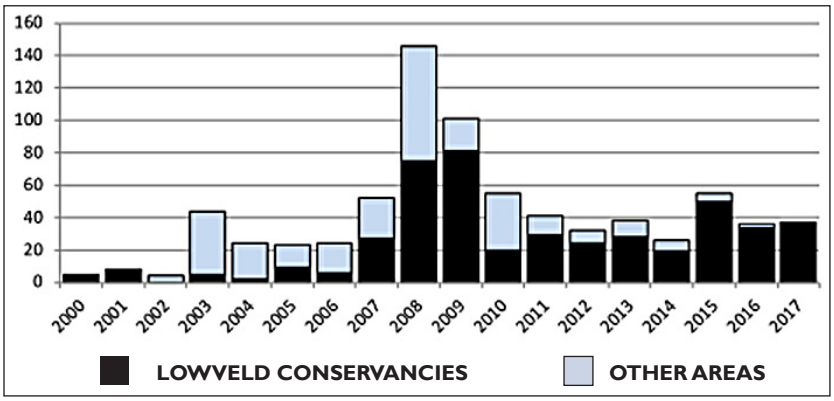
2.10.5 Endangered animal species

Among the 14 endangered animal species in Zimbabwe, the populations of 10 are decreasing, while those of the other four are either unspecified or unknown (Table 6, Target 10). There are management plans for African wild dog, grey crowned crane, Cape vulture, lappet-faced vulture and Egyptian vulture and they are being systematically monitored.

2.10.6 Vulnerable animal species

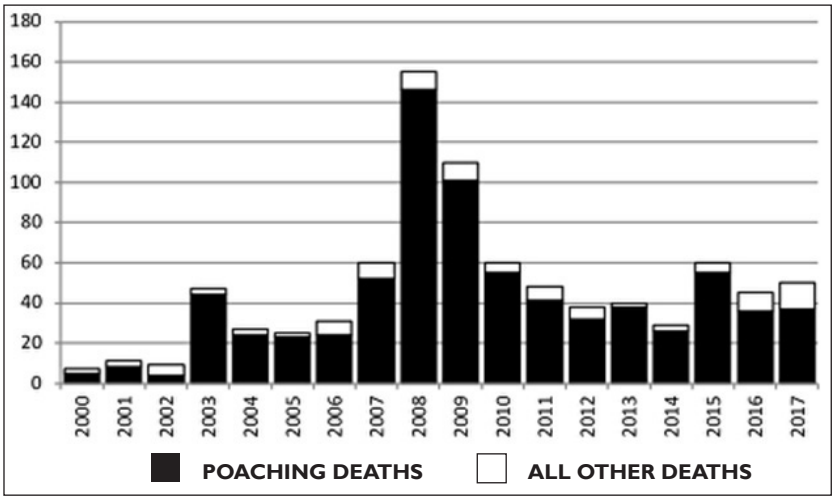
The populations of the African elephant (*L. africana*) and lion (*P. leo*) have increased in Zimbabwe, but among the 32 vulnerable species the populations of 19 species have declined (Table 7, Target 10). There are species-specific conservation plans for the elephant, cheetah (*A. jubatus*), wattled crane (*B. carunculatus*), blue swallow (*H. atrocaerulea*), leopard (*P. pardus*) and

Figure 2. 18 Rhino poaching deaths in Zimbabwe from 2000 to 2017



Source: Lowveld Rhino Trust Zimbabwe: http://lowveldrhinotrust.org/

Figure 2. 19 Detected rhino (both species) deaths in the Lowveld conservancies 2000 to 2017



Source: Lowveld Rhino Trust Zimbabwe: http://lowveldrhinotrust.org/

the lion. There are no systematic population monitoring programmes for most of the other species.

2.10.7Target 10 and its implementation

Target 10 proposed a number of key activities for enhancing the conservation status of threatened species, including undertaking population status and trends studies, assessment and review of threats and developing and implementing management plans for selected priority species. Of the 49 plant species that are either endangered or threatened, the population status and trends of 27 (55.1%) are known. Among the 56 animal species that are critically endangered, endangered or vulnerable, the trends and status in populations of 40 (71.4%) have been determined. The threats and threat levels for most of these plant and animal species have been determined. There is no species-specific conservation or management plan or strategy for any of the 49 plant species, while among the animals seven (12.5%) have species-specific conservation or management plans.

Target 10 also proposed the promotion and strengthening of transboundary mechanisms for conservation of threatened species. As a member of the Southern African Development Community, Zimbabwe has been involved in the promotion of transfrontier conservation areas (TFCAs). These are large ecological regions that straddle the boundaries of two or more countries, encompassing one or more protected areas as well as multiple resource use areas. The aim is to enhance collaborative management of shared natural and cultural resources across international boundaries for improved biodiversity conservation and socio-economic development.[112]

Zimbabwe has signed treaties establishing two TFCAs – the Great Limpopo TP and TFCA (Mozambique, South Africa and Zimbabwe) and the Kavango Zambezi TFCA (Angola, Botswana, Namibia, Zambia and Zimbabwe). There are also two emerging TFCAs for which a memorandum of understanding had been signed – Chimanimani TFCA (Mozambique and Zimbabwe) and Greater Mapungubwe TFCA (Botswana, South Africa and Zimbabwe). Two others are in conceptual stages – Lower Zambezi-Mana Pools TFCA (Zambia and Zimbabwe) and ZIMOZA TFCA (Mozambique, Zambia and Zimbabwe).

2.10.8 Effectiveness of the implementation measures for Target 10

The measures implemented for Target 10 have been partly effective. Zimbabwe has two established TFCAs and four others at various stages of development. Although trends and status in populations of some the threatened species of plants and animals have been determined, those of a substantial number of threatened plants (44.9%) and animals (28.6%) have not. Among the threatened plant and animal species, there are species-specific conservation or management plans for only six animals .

2.10.9 Obstacles encountered in implementation of Target 10: Limited funding for regular monitoring of population trends and status of threatened species.

2.10.10 Scientific and technical needs to achieve Target 10: Adequate funding for regular assessment of population trends and status of threatened species.

Table 6, Target 10: Animal species in Zimbabwe listed as endangered on the IUCN Red List

Table 7, Target 10: Animal species in Zimbabwe listed as vulnerable on the IUCN Red List

TARGET 11: By 2020, develop and implement strategies to conserve and maintain cultivated, farmed and domesticated genetic resources and their wild relatives, including other socio-economically and culturally valuable species

About 68.5% of the total employed population of Zimbabwe works in agriculture.[113] Agricultural and forest areas make up 42% and 36% of the country's land mass respectively,[114] and value added as a percentage of GDP for agriculture, forestry and fishing was at 10.46% in 2017.[115] Agriculture and agricultural biodiversity are thus important components of Zimbabwe's economy and of the livelihoods of the majority of the population. Zimbabwe's agriculture is based on a diverse range of food crops, commercial crops, fruit and livestock. The agricultural biodiversity covers cereals such as maize, sorghum, pearl millet, finger millet and wheat; legumes (soybeans, cowpeas and Bambara nuts); horticultural crops (potatoes, paprika and cucumber); indigenous and exotic cattle, sheep, goats, pigs, poultry, donkeys and horses; farmed wildlife; cash crops (tobacco, coffee, cotton, tea, and sugarcane); oranges, bananas and apples; and timber. More than 100 agricultural crops are grown, notably maize, cotton, soybeans, wheat and tobacco. Table 1, Target 11 shows the strategies and activities for implementation of Target 11.

2.11.1 Cultivated crops

Cultivated crops cover almost a third of the land area of Zimbabwe and are classified into four broad categories.[116] The first comprises grain and cereals, largely maize, wheat and small grains such as sorghum, pearl millet and finger millet. Maize, the national staple, accounts for 47% of the calorie intake, while sorghum is a principal food source for marginal areas with erratic rainfall and poor soils. Pearl millet, finger millet and rice also contribute significantly to the diets of local people. The second group comprises oil seed crops, including soybeans and sunflowers. The third is made up of plantation and horticulture crops such as sugarcane, tea, coffee, citrus, flowers, vegetables and groundnuts. The final category groups the major export crops such as tobacco and cotton.

Table 1, Target 11: The strategies, actions and indicators for Target 11 and summary comments on progress on implementation

2.11.2 Farmed animals

The main livestock found in Zimbabwe are cattle, sheep, goats and pigs. Smallholder farmers in the communal sector hold most of the livestock.[117] Cattle are the most abundant livestock in all farming sectors, followed by goats. An estimated 60-75% of rural households own cattle, and approximately 90% of the cattle in Zimbabwe are owned by smallholder households, making cattle ownership a significant asset.[118]

2.11.3 Threats to genetic diversity of cultivated plants, farmed and domesticated animals, and their wild relatives

Available evidence suggests that there has been substantial genetic erosion across traditional food crops and animals in Zimbabwe.[119] There is need for studies to identify and understand trends in diversity of cropped plants, farmed animals and wild plants and animals that are harvested for food. For example, most of the farmer varieties of maize are extinct and can only be found in ex situ collections,[120] which is largely due to the promotion of hybrid maize seed over local landraces.119 The main threats to biodiversity for food and agriculture in Zimbabwe are climate change, veld fires, deforestation, invasive species, mining, pollution, promotion of hybrids, human encroachment and over-exploitation.

2.11.4 Conservation of the genetic diversity of cultivated plants

The Department of Research and Specialists Services (DRSS), working with the Community Technology Development Organization (CTDO), International Maize and Wheat Improvement Centre (CIMMYT) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), has promoted the conservation of crop genetic resources, including those of threatened, underutilized, indigenous and naturalized crops. This is done through crop ecogeograph-

ic surveys, germplasm collections, characterization and evaluation, and on-farm conservation activities, among other activities.

The DRSS houses the Crop Breeding Institute (CBI) and the National Gene Bank, which is part of the SADC Plant Genetic Resources Centre Network of Gene Banks.[121] The CBI breeds, maintains and makes available to stakeholders 13 crop varieties: maize (Zea mays), wheat (*Triticum aestivum*), groundnut (*Arachis hypogea*), soybean (*Glycine max*), sunflower (*Helianthus annuus*), cowpea (*Vigna unguiculata*), rice (*Oryzae sativum*), common bean (*Phaseolus vulgaris L.*), sorghum (*Sorghum bicolor*), finger millet (*Eleusine coracana*), pearl millet (*Pennizetum glaucum*), potato (*Solanum tiberosum*) and Bambara nut (*Vigna subterranean*).[122] The National Gene Bank has focused its research activities on underutilized and indigenous crop genetic resources such as pearl millet, finger millet, sorghum, cowpea, Bambara nut, cucumbers, calabash (*Lagnaria*) and wild crop relatives.[123]

The CTDO is an agricultural and rural development organisation established in 1993. It operates in 21 districts of Zimbabwe (Figure 2.20) with sub-offices in each district.[124] It implements sustainable development initiatives targeting the following areas: HIV prevention, care and support; biodiversity conservation and use; environment; climate change; community income-generating activities; crop production and food security; humanitarian assistance; policy and advocacy issues for the poor; and activities that seek to reduce poverty, hunger, malnutrition and environmental degradation. It works with other stakeholders and has made a positive impact on conservation of agricultural biodiversity through community seed fairs, community seed banks and influencing policy makers to uphold farmer's rights within the framework of the International Treaty on Plant Genetic Resources. Fifteen community seed banks have been set up; they are repositories that provide strategic seed reserves and ensure farmers' seed security and easy access to seeds of their choice. The seed banks are also centres of excellence where smallholder farmers are trained in quality seed production and participatory plant breeding.

In 2017, the CTDO established over 340 farmer field schools promoting food and nutrition security in Mudzi, Rushinga, Uzumba-Maramba-Pfungwe, Goromonzi, Mt Darwin, Chiredzi, Chipinge, Murehwa, Mutoko, Matobo and Tsholotsho districts.[125] Working with the CPI, ICRISAT and CIMMYT, it introduced 33 lines of open-pollinated varieties of maize, five advanced lines of groundnuts, 11 advanced lines of sorghum and nine advanced lines of pearl millet for evaluation in the farmer field schools. Over 40 farmer field schools promoting neglected and under-utilized crop species were established. Diagnostic exercises were conducted in the schools to assess nutritional challenges, the level of utilization by farmers of neglected and under-utilized crop species and to find ways to overcome these challenges. A field guide was used to roll out the nutrition field schools and farmers assessed the nutritive value of *Cleome gynandra* (cats' whiskers, *nyevhe* or *lude*), *Bidens pilosa* (blackjack or mutsine) and *Amaranthus hybridus* (pigweed or *mowa*), among other crops.[126]

Figure 2. 20 The 21 CTDO operational districts in Zimbabwe

Source: CTDO Annual Report 2017: www.ctdt.co.zw/

2.11.5 Conservation of the genetic diversity of farmed and domesticated animals

The smallholder farming sector still holds most of Zimbabwe's livestock. The populations of most livestock species declined from 2000 to 2012 due to erratic rainfall. Indigenous crop and livestock varieties have become increasingly important as they have proved to be more tolerant to disease and changes in climate. Indigenous cattle breeds are Mashona, Tuli and Nguni, which are found mainly in the smallholder sector.[127], [128]

2.11.6 Target 11 and its implementation

The implementation of Target 11 had as some of its requirements the development of a checklist of cultivated plant and farmed animals, the establishment of fully equipped plant and animal gene banks and raising public awareness of biosafety issues.

Checklists of cultivated plants and farmed animals have been developed. Hyde et al[129] provide a list of cultivated plants in Zimbabwe which has 189 plant families, and they point out that it is provisional and incomplete. The list is not readily accessible by non-botanists, and there is a need to develop a simple, user-friendly list of cultivated plants.

The mission of the National Gene Bank is to maintain and enhance the diversity of crop genetic resources, which include the threatened, underutilized, indigenous and naturalized crops that are important for food and agriculture.[130] An animal gene bank is yet to be established. Zimbabwe is a signatory to the Cartagena Protocol on Biosafety and the National Biotechnology Authority is the designated authority. A biosafety framework was put in place in the early 1990s and there have been significant improvements in legislation and institutional arrangements. Biosafety awareness activities have been held, although a nationwide survey is needed to assess knowledge among the public.

To enhance safeguarding of genetic diversity, Target 11 proposes the promotion of market-driven strategies for local crop and livestock varieties. There has been substantial progress especially with regard to local crop varieties. According to Mushita et al,[131] the support offered by government agencies such as the National Gene Bank and collaborating institutions like CTDO, ICRISAT and CIMMYT has not only enhanced the technical and management capacity of small-scale farmers, but also facilitated the scaling up of the seed banks and networking among the farmers nationally. This has enabled the farmers to produce and sell seeds in large volumes.

2.11.7 Effectiveness of the implementation measures for Target 11

The measures implemented for Target 11 have been effective, as most smallholder farmers are cultivating local crop varieties and rearing local animal varieties.

2.11.8 Obstacles encountered in implementation of Target 11

Zimbabwe's agricultural sector is the backbone of its economy, and the sector has over the years received substantial attention and support from the government and development partners to increase production as conduct research. There are massive amounts of data and information about agriculture in Zimbabwe, but it has not been fully harnessed. Most of it is not readily available within a centralized database but dispersed among different institutions.

2.11.9 Scientific and technical needs to achieve Target 11

- Training in developing, establishing and maintaining a database for cultivated, farmed and domesticated genetic resources and their wild relatives
- Training in the use of big data tools and techniques

TARGET 12: By 2020, implement policies and strategies to restore and maintain ecosystem integrity and reduce ecosystems degradation to enhance the livelihoods and well-being of all Zimbabweans, especially those of women, indigenous and local communities and the poor and vulnerable

Gender, poverty and equality are important in biodiversity conservation and environmental management.[132] In Zimbabwe's rural areas, women are at the forefront of environmental use and management through their involvement in farming and harvesting natural resources. [133] The 2012 census showed a dominance of females at provincial and national levels. Studies in Zimbabwe and elsewhere have revealed that women's participation in the rural economy is largely confined to agricultural production for domestic consumption and the collection of wild food varieties for immediate household food security.[134] Poverty is also more prevalent and intense in rural areas. Rural dwellers, who make up 68% of the country's population, are largely dependent on agriculture and the exploitation of natural resources, and this has direct consequences for biodiversity and its conservation. Target 12 proposes gender mainstreaming and diversification of income-earning opportunities to maintain ecosystems integrity and enhance the livelihoods and well-being of all Zimbabweans, especially women, local communities and the poor and vulnerable (Table 1, Target 12).

Table 1, Target 12: The strategies, actions and indicators for Target 12 and summary comments on progress on implementation

2.12.1 Target 12 and its implementation

2.12.1.1 Incorporate gender consideration in all laws, policies, strategies, by-laws and mechanisms that govern management, access and control of biodiversity resources

The founding values and principles of Zimbabwe's Constitution enshrine recognition of the inherent dignity and worth of each human being, of the equality of all human beings and of gender equality. Section 17 calls for the participation of women to be promoted in all spheres of society on the basis of their equality with men. It requires the State to take measures and make laws to ensure equal gender representation in all institutions and at all levels of government and ensure that women have access to resources, including land, on the basis of equality with men. Sections 20, 21 and 22 require the mainstreaming of measures to ensure the full participation of youth, the elderly and people with disabilities in political, social and economic spheres of life.

ZimAsset, the policy guiding framework from October 2013 to December 2018, had six main clusters, including social services and poverty eradication. Targeted measures for improved gender equality and equity called for, among others: awareness campaigns about gender-based violence; mobilizing resources to increase the number of women groups benefiting from the women's development fund; establishing and strengthening mechanisms for women to participate effectively and benefit from empowerment programmes; and implementing sector gender policies and programmes. It also proposed that economic opportunities for women, youths and the physically challenged be increased in line with the thrust to enhance indigenisation, empowerment and employment creation.

The Transitional Stabilisation Programme, Zimbabwe's new policy guiding agenda from October 2018 to December 2020, also calls for mainstreaming of gender, youth and vulnerable groups to eliminate economic, social and cultural practices that counteract gender equality. The gender milestones and deliverables relate to further mainstreaming of gender-sensitive policies and laws:

- Integrating gender issues with national and sectoral economic policies, national budget policies, call circulars and guidelines
- Programming and budgeting, which involve identifying gender issues, interventions, budget costings and setting performance benchmarks
- Prioritizing resource allocation, disbursement and implementation of national and sectoral gender plans and programmes
- Implementing gender-sensitive programmes and projects targeting women and youths

Thus, although women and girls in Zimbabwe continue to face numerous challenges in the political, social and economic spheres because of gender discrimination and imbalance, the country has a strong policy and legal commitment to gender equality.

2.12.1.2 Promote and support innovative income-generating initiatives utilizing biodiversity and ecosystems sustainably and support public-private-community partnerships (PPCPs) for viable biodiversity-based businesses

The PPCP approach is a synergistically operational model which is used to achieve sustainable development: the public and private sectors and a community jointly develop a business unit or service of mutual benefit and so provide benefits to the wider community. Development programmes acknowledge the importance of PPCPs in enhancing sustainable development. Some of the programmes that seek to promote PPCPs in Zimbabwe are the Zimbabwe Resilience Building Fund (ZRBF), strengthening biodiversity and ecosystems management and climate-smart landscapes in the mid to lower Zambezi region, and the Hwange-Sanyati biological corridor (HSBC) project.[135]

2.12.1.3 The Zimbabwe Resilience Building Fund

The ZRBF is supported by the Ministry of Lands, Agriculture, Water, Climate and Rural Resettlement, European Union, Embassy of Sweden, UN Development Programme (UNDP) and Britain's Department for International Development (DFID). It is a long-term initiative whose primary objective is to contribute to increased capacity of communities to protect development gains in the face of recurrent shocks and stresses and so enable them to contribute to the economic development of Zimbabwe.[136] The fund seeks to attain its objective through multi-stakeholder implementation of three interlinked multi-sectorial outputs: increased application of evidence in policy making for resilience; increased and improved absorptive, adaptive and transformative capacities of at-risk communities; and timely and cost-effective response to emergencies implemented through existing safety net and other relevant programmes. The ZRBF is supporting the implementation of activities in 18 rural districts (Figure 2.21) through seven project consortiums. The aim is to enhance the adaptive, absorptive and transformative capacities of communities to withstand shocks and stresses. Summaries of each of the seven projects are shown in Table 4, Target 12.

Table 4, Target 12: Summary description of ZRBF projects

2.12.1.3 Strengthening biodiversity and ecosystems management and climate-smart landscapes in the mid to lower Zambezi region of Zimbabwe[137]

This project is funded under the GEF Trust Fund. The implementing agency is the UNDP and the executing agency is the Ministry of Environment, Tourism and Hospitality Industry. The objective is to promote an integrated landscape approach to managing wildlife resources, carbon and ecosystem services in the face of climate change in the protected areas and community lands of the mid to lower Zambezi region. The project seeks to enhance the livelihoods of communities and promote gender equality. It will address its main objective in implementing four strategies: strengthening capacity and governance frameworks for integrated wildlife and forest management and wildlife and for-

est crime enforcement; strengthening PA estates and CAMPFIRE conservancies in areas of global biodiversity significance; mainstreaming biodiversity and ecosystem services management and climate change mitigation in the wider landscape; and knowledge management, monitoring and evaluation, and gender mainstreaming.

2.12.2 Effectiveness of the implementation measures for Target 12

The measures that have implemented for Target 12 have been effective as gender balance in biodiversity programmes has been promoted and achieved.

2.12.3 Obstacles encountered in implementation of Target 12

The Constitution has strong gender equality provisions that outlaw discrimination against women, that promote women's full participation in all aspects of society and that abolish all 'laws, customs, traditions, and practices' that infringe on women's rights and equality with men. According to the Research and Advocacy Unit, the Constitution's mandate for gender equality is not reflected in Zimbabwe's existing laws or practices,[138] and there is therefore need to ensure that all laws and policies be aligned with and meet the requirements of the Constitution

Zimbabwe is largely a patriarchal society, which has been a major obstacle in gender equality and advancing livelihoods and well-being among women. Tradition and cultural practices have tended to limit women's economic opportunities, and in the home men generally retain greater access to and control over household economic resources.[139] Women generally have limited access to land and little decision-making power on land use, if any.[140] Poverty and economic reliance on men expose many rural and urban women to abuse. The success in the implementation of Target 12 therefore entails promotion of programmes that tackle patriarchal practices in Zimbabwean society

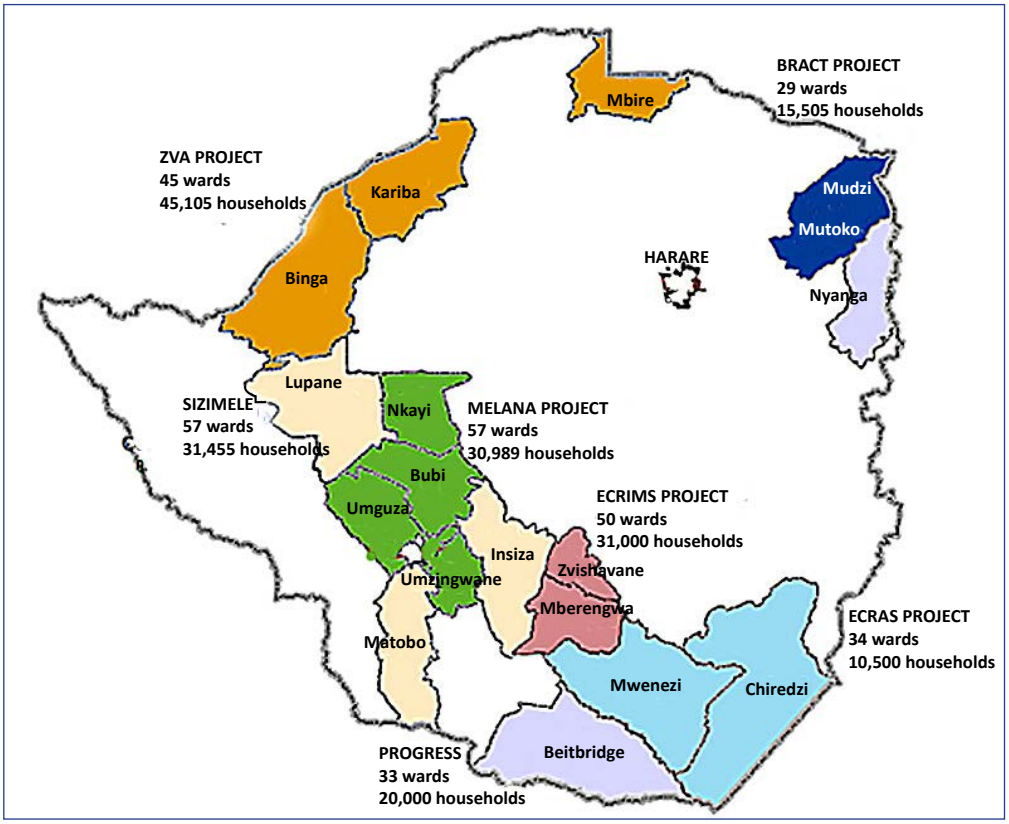
2.12.4 Scientific and technical needs to achieve Target 12: Support and implementation of programmes targeting women's empowerment and poverty alleviation, especially in the rural areas

TARGET 13: By 2020, combat desertification and enhance ecosystem resilience through conservation and restoration of degraded ecosystems

2.13.1 Desertification and land degradation

The UN Convention to Combat Desertification (UNCCD) defines land degradation as any reduction or loss in the biological or economic productive capacity of the land which is generally caused by human activities, exacerbated by natural processes and often magnified by and closely intertwined with climate change and biodiversity loss.[141] Desertification is land degradation

Figure 2. 21 The Zimbabwe Resilience Building Fund project sites across the country



Source: Zimbabwe Resilience Building Fund: www.zrbf.co.zw

in arid, semi-arid and dry, sub-humid areas resulting from climatic variations and human activities.[142] Desertification processes affect about 46% of Africa. The Food and Agriculture Organization estimates that by 2030, Africa will lose two-thirds of its arable land if desertification is not stopped.

In Zimbabwe, agricultural dry lands constitute approximately 42% of the total arable land, and large tracts of these lands are subject to various degrees of degradation, which reduces the social and biological potential of the land and increases the effects of desertification. Land degradation in the form of soil erosion, deforestation and crop nutrient mining are common in this area and are worsened by periodic droughts and floods.[143] The annual cost of land degradation in Zimbabwe is estimated at $382 million, which is equal to 6% of the GDP.141 Target 13 addresses desertification and ecosystem degradation in Zimbabwe through the implementation of three activities (Table 1, Target 13).

Table 1, Target 13: The strategies, actions and indicators for Target 13 and summary comments on progress on implementation

2.13.2 Target 13 and its implementation

The aim of Target 13 is to combat desertification and enhance ecosystem resilience through the following: conservation and restoration of degraded ecosystems; reclaiming and rehabilitating degraded areas, wetlands, watersheds and rivers; implementing interventions for priority water bodies and major watercourses; and incorporating UNCCD actions into biodiversity conservation initiatives.

2.13.2.1 Reclaim and rehabilitate degraded areas, wetlands, watersheds and rivers

A number of initiatives to combat ecosystem degradation are being implemented across the country. Table 2, Target 13 presents summaries of eight programmes or initiatives that are ongoing to curb ecosystem degradation in Zimbabwe.

Table 2, Target 13: Programmes or initiatives to address ecosystem degradation in Zimbabwe

2.13.2.2 Incorporate UNCCD actions into biodiversity conservation initiatives

The proposed incorporation, which would have enabled the adoption of joint planning and reporting for the UNCCD and CBD by Zimbabwe, is still to take place.

2.13.3 Effectiveness of the implementation measures for Target 13

The measures implemented for Target 13 have been partly effective. Over the last two decades, there have been some notable achievements towards reversing ecosystem degradation. There has been an increase in the proportions of both terrestrial and aquatic key biodiversity areas: the areas that are completely covered by protected areas in the former are 85.88% compared to 62.73% in 2001 and the latter at 79.03% compared to 60.49% in 2000. In 2017, the degree of integrated water resources management implementation was relatively high at 61%, while the levels of water stress (freshwater withdrawal as a proportion of available freshwater resources) were relatively low at 24.3%.[144]

2.13.4 Obstacles encountered in implementation of Target 13

Zimbabwe has experienced severe economic decline over the last decade, which has limited its capacity to implement ecosystem restoration programmes. Local authorities have been especially affected and have not been able to invest adequately in waste management and environmental restoration programmes.

2.13.5 Scientific and technical needs to achieve Target 13: Capacitation of local authorities in waste management and environmental restoration.

TARGET 14: By 2015, accede to and domesticate the Nagoya Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization

The Nagoya Protocol was adopted on 29 October 2010 in Nagoya, Japan, and came into force on 12 October 2014. Its objective is the fair and equitable sharing of benefits arising from the utilization of genetic resources, thereby contributing to the conservation and sustainable use of biodiversity.[145] It also covers traditional knowledge associated with genetic resources and the benefits arising from its utilization. Target 14 of NBSAP2 addressed the actions towards the accession to and domestication of the Nagoya Protocol in Zimbabwe (Table 1, Target 14).

2.14.1 Target 14 and its implementation

Zimbabwe has been a party to the Nagoya Protocol since 30 November 2017. It is also party to the International Treaty on Plant Genetic Resources for Food and Agriculture. The treaty is aimed at the following: recognizing the contribution of farmers to the diversity of crops that feed the world; establishing a global system to provide farmers, plant breeders and scientists with access to plant genetic materials; and ensuring that recipients share benefits they derive from the use of these genetic materials with the countries where they originated.[146] Three actions have undertaken in implementing Target 14: capacity building on access and benefits sharing (ABS) negotiations; developing appropriate instruments for accession and domestication; and promoting awareness on provisions of ABS instruments.

Workshops and meetings were held in all provinces of Zimbabwe to build capacity on ABS negotiations and to promote awareness on the provisions

of the protocols. The meetings are still taking place.

Table 1, Target 14: The strategies, actions and indicators for Target 14 and summary comments on progress on implementation

2.13.6 Effectiveness of the implementation measures for Target 14

The measures implemented for Target 14 have been partly effective. Zimbabwe is party to the Nagoya Protocol, and workshops and meetings have been held to raise awareness and build capacity on ABS issues. The protocol is still to be fully domesticated.

2.13.7 Obstacles encountered in implementation of Target 14

Although Zimbabwe is party to the Nagoya Protocol, Chibememe et al[147] point out that there is need to align related policies and laws with the constitutional provisions ABS. They note that the current Zimbabwean laws and policies on ABS predate the Constitution and the Nagoya Protocol, both of which contain clauses and provisions that are more progressive than those found in laws such as Statutory Instrument 61 of 2009 (Access to Indigenous Genetic Resources and Genetic Resource-based Knowledge) Regulations and the National Environment Policy and Strategies of 2009.

2.13.8 Scientific and technical needs to achieve Target 14: Capacity building in developing domestic ABS legislation to implement the Nagoya Protocol.

Target 15: By 2015, NBSAP updated and adopted as a policy instrument, and implementation has commenced

2.14.1 NBSAP adoption as policy and planning instrument

NBSAP2 was adopted in February 2016 and submitted to the CBD secretariat on 16 February that year. It is now recognized as a policy instrument to guide biodiversity conservation. Table 1, Target 15 shows the actions and indicators that were adopted towards implementation and assessment of progress for the target.

One of the actions for the target was sensitization of heads of ministry departments on NBSAP. During the consultations for this report, many stakeholders noted that sensitization and awareness of NBSAP had been limited and a number of participants professed ignorance of the biodiversity strategy and action plan and its contents. At least 30% of the costs of implementing NBSAP2 was supposed to be met by Treasury funding. There has been limited budgetary support for NBSAP2 implementation; monitoring and evaluation of its execution have been lacking, and it has not been possible to produce annual progress reports. Although some institutions have used NBSAP2 to mobilize funding for their activities, and most biodiversity-related projects can be linked to and do address its objectives, such measures cannot be seen to promote and implement it.

Table 1, Target 15: The strategy, actions and indicators for Target 15 and summary comments on progress on implementation

2.15.2 Effectiveness of the implementation measures for Target 15

The measures implemented for Target 15 have been partly effective. NBSAP2 was adopted as a policy instrument, but funding for its implementation has not been prioritized. Therefore, there has been no annual progress report on its implementation.

2.15.2 Obstacles encountered in implementation of Target 15

Funding for coordination, monitoring and evaluation of the implementation of NBSAP2 has not been prioritized.

2.15.2 Scientific and technical needs for Target 15: Provision of adequate funding to assess annually the implementation of NBSAP2 and produce annual reports.

TARGET 16: By 2020, the traditional knowledge, innovations and practices of local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, integrated and reflected in the implementation of NBSAP with the full and effective participation of local communities at all relevant levels

Indigenous knowledge and biodiversity are complementary phenomena essential to human development.[148] Local and indigenous people have their own ecological understandings, conservation practices and resource management goals which have important implications that must be factored in when making decisions for conservation of biodiversity. While local and indigenous people were previously perceived simply as resource users, they are today recognized as essential partners in environmental management.[149] Using the knowledge, innovations and practices of indigenous and local communities to conserve biodiversity can achieve effective and just conservation outcomes while addressing erosion of both cultural and biological diversity.[150]

Target 16 is aimed at harnessing the traditional knowledge, innovations and practices of local communities in implementation of NBSAP2 to enhance community participation and the conservation and sustainable use of biodiversity. The two strategies and

six actions of the target are therefore directed towards community empowerment and participation and mainstreaming indigenous knowledge systems (IKS) into biodiversity conservation (Table 1, Target 16).

Table 1, Target 16: The strategies, actions and indicators for Target 16 and summary comments on progress on implementation

2.16.1 Traditional knowledge, biodiversity and the legislative framework

Section 13(2) of the Constitution requires that the State involve the people and communities in the formulation and implementation of development plans and programmes that affect them. Section 16 calls for the upholding of cultural values of Zimbabwe. It requires that the State, all institutions of government and all Zimbabweans promote and preserve cultural values and practices, Zimbabwe's heritage; they should respect traditional institutions. With respect to traditional knowledge, Section 33 compels the State to take measures to preserve, protect and promote indigenous knowledge systems, including knowledge of medicinal and other properties of animal and plant life possessed by local communities and people.

Section 116 (1) (i) and (j) of the Environmental Management Act (Chapter 20:27) require the Ministry of Environment, Tourism and Hospitality Industry to protect indigenous property rights of local communities in respect of biological diversity with scientific knowledge, and to support the integration of traditional knowledge of conservation of biological diversity with scientific knowledge.

The Environmental Management (Access to Genetic Resources and Indigenous Genetic Resource-based Knowledge) Regulations (Statutory Instrument 61 of 2009) give further direction on the traditional knowledge, innovations and practices of local communities relevant for the conservation and sustainable use of biodiversity. They are aimed at protecting the rights of local authorities and communities to their genetic materials and indigenous genetic resource-based knowledge.

2.16.2 Community empowerment and participation

The Environmental Management Act (Chapter 20:27) provides for the preparation of local environmental action plans (LEAPs) by local authorities. In preparing a LEAP, the local authority leads the process and obtains input from all stakeholders within a community – government institutions, traditional leaders, community members, industry and private business, NGOs, CBOs, religious groups, councillors and other interested parties. The process identifies environmental challenges in the district or area, assesses and prioritizes environmental issues, and develops an action plan and a monitoring plan. EMA offers training and refresher workshops to local authorities in developing LEAPs. There are 28 urban councils and 58 rural districts, and by October 2015, 78 local authorities had been trained in developing LEAPs.[151] Across the country, therefore, there are community environmental structures in place in each district that address environmental health and biodiversity issues.

The extent and diversity of indigenous and community conservation areas (ICCAs) are inadequately documented. According to Chibememe et al,[152] ICCAs occur in communal areas all over the country, largely in the form of grazing lands, watersheds and sacred sites. The areas are generally managed under traditional norms, customs and beliefs such as prohibitions around fire or cutting of trees. Violation of the beliefs, customs and practices attracts the attention of the traditional leaders, who have the authority to try and fine such offenders.

2.16.4 Mainstreaming indigenous knowledge systems into biodiversity conservation

Zimbabwe recognizes the importance of IKS in biodiversity conservation and sustainable development. The country has been a party to the Nagoya Protocol by accession since 30 November 2017, and to the Swakopmund Protocol on the Protection of Traditional Knowledge and Expressions of Folklore since 22 April 2013. There is therefore an appreciation that local communities should not only benefit from the wild flora and fauna in their immediate localities, but as holders of traditional knowledge they should also benefit when the knowledge is used beyond the traditional context for commercial purposes. According to Chibememe et al,[153] there is need for the State to take deliberate steps to ensure that relevant or related laws and policies are aligned with the constitutional provisions on ABS.

2.16.5 Effectiveness of the implementation measures for Target 16

The measures implemented for Target 16 have been partly effective. All local authorities in Zimbabwe are developing and implementing LEAPs. Although indigenous knowledge is acknowledged in the Constitution and the legal and policy framework of Zimbabwe, it has still to be mainstreamed into biodiversity conservation. Documentation of indigenous and community conservation areas has been inadequate, and a national report on values, taboos and customary and traditional knowledge is still to be produced.

2.16.6 Obstacles encountered in implementation of Target 16

Although globally acknowledged as being of immense value, especially in enhancing resilience and sustainable development of communities, much of the indigenous knowledge and practices in Africa are disappearing. This is because of the intrusion of foreign

technologies and development concepts that promise short-term gains or solutions to problems without being capable of sustaining them.[154] Indigenous knowledge is important because it often the only asset of many poor rural societies and its significance increases as other resources disappear or dwindle.[155] In Africa, indigenous knowledge is still largely an unwritten body of knowledge held in different brains, languages and skills, in as many groups, cultures and environments as are available today.[156] The documentation and dissemination of indigenous knowledge across Africa have been a challenge. Although there have been many studies on indigenous knowledge in Zimbabwe, there has been no deliberate national-scale initiative to record or profile it and so conserve the broad spectrum of indigenous knowledge across the country.

2.16.7 Scientific and technical needs for Target 16:

- Technical assistance with documenting values, taboos, customary and traditional knowledge relevant to the conservation and sustainable use of biodiversity across the country
- Technical and financial assistance for surveys and documentation of indigenous and community conservation areas

TARGET 17: By 2020, science, technology and innovation relating to biodiversity, its values, functioning, status and trends and the consequences of its loss are strengthened, improved, widely shared, transferred and applied

Investment in science and technology is essential for sustainable social, environmental and economic development in face of pressing environmental changes that demand innovative ways to reconcile the conservation and use of natural resources with the reduction of poverty and inequality.[157] Funding science, technology and innovation relating to biodiversity enables the generation of new knowledge on biodiversity itself but also on ecosystem services essential to human well-being.[158] Target 17 has three activities for implementation towards enhancing science, technology and innovation for biodiversity conservation in Zimbabwe (Table 1,Target 17).

2.17.1 Science and technology innovations for reducing biodiversity loss

2.17.1.1 Zimbabwe's capacity in science, technology and innovation

Countries across the globe have through Sustainable Development Goal 9 pledged to 'build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation', and especially to encourage innovation and substantially increase the number of researchers and spending on research and development.[159] According to the New Partnership for Africa's Development,[160] the national systems of innovation of many African countries are too weak to take advantage of new opportunities arising from rapid scientific and technological development, intensifying regionalization and globalization, increased foreign direct investment flows, political stability and better macro-economic conditions on the continent. The main issue that needs to be addressed to strengthen national systems of innovation is mostly human resource capacity. The African Capacity Building Foundation[161] asserts that African countries lack specific human and institutional capacities, critical technical skills and resources to promote science and technology innovations (STI). In a number of countries, the limited human resource capacity has been due to the flight of experienced and young and educated personnel, but also the skewed investment priorities of African countries, which have yet to convert political commitments into practical programmes for STI-based development. The current average of African spending on research and development is about 0.5% – half of the GDP pledged in 1980 and again in 2005.

The second Science, Technology and Innovation Policy of Zimbabwe 2012 has six primary goals:

- Strengthen capacity development in STI
- Learn and utilize emergent technologies to accelerate development
- Accelerate commercialisation of research results
- Search for scientific solutions to global environmental challenges
- Mobilize resources and popularize science and technology
- Foster international collaboration in STI

Zimbabwe has experienced significant human capital flight over the last two decades, which has set back the implementation of its developmen programmes. In 2010/11, emigration rates of highly skilled Zimbabweans to Organisation for Economic Co-operation and Development (OECD) member states was greater than 20%, and about 43% of Zimbabwe's highly skilled personnel lived in OECD countries.[162]

The Africa Capacity Index (ACI) measures and assesses the capacity against the development agenda in African countries. The index is computed from four sub-indices: policy environment; processes for implementation; development results at country level; and capacity development outcomes. In 2016, the ACI score for Zimbabwe was 46.3 out of 100, putting the country in the medium-perfomance bracket, and positioning it at 35 out of the 44 countries that were assessed (Figure 2.22). Table 2, Target 17 shows Zimbabwe's profile of its ACI capacity in STI.

Table 1, Target 17: The strategy, actions and indicators for Target 17 and summary comments on progress on implementation

Table 2, Target 17: Profile of Zimbabwe's ACI capacity in science, technology and innovation

A tax effort index value above 1 indicates 'high tax effort'; below 1, 'low tax effort'. From 1996 to 2013, Zimbabwe had a high tax effort index (Table 2, Target 17), implying that the country was utilizing its tax base well to increase revenues. Its performance with respect to the component indices that are used to compute the ACI varied from very low to very high. It had a very high performance score with regard to gender equality mainstreaming and social inclusion, high performance scores for policy choices for capacity development and development cooperation effectiveness, a medium score partnering for capacity development, and very low perfomance score for capacity profiling and capacity needs assessment.

The 2018 edition of the Global Innovation Index (GII) ranks countries according to science and technology activity, relying on international patent filings as well as scientific publishing activity.[163] The broad framework of the GII consists of four measures: the overall GII, the innovation input index, the innovation output sub-indices, and the innovation efficiency ratio. The overall GII score is an average of the input and output sub-index scores. The former consists of five input pillars that capture elements of the national economy which enable innovative activities: institutions, human capital and research, infrastructure, market sophistication and business sophistication. The innovation output sub-index provides information about two output pillars that are the results of innovative activities within the economy: knowledge and technology outputs and creative outputs. The innovation efficiency ratio, which shows how much innovation output a given country is getting for its inputs, is the ratio of the output sub-index score to the input sub-index score. Each pillar is divided into three sub-pillars and each sub-pillar is composed of individual indicators for a total of 80 indicators in the 2018 GII.

The 2018 GII score for Zimbabwe was 23.10 out of a 100, with a global rank of 113 out of the 126 countries, and a regional ranking of 14 out of the 24 sub-Saharan countries. Table 3, Target 17 shows Zimbabwe's GII profile for 2014 to 2018. Generally, Zimbabwe has been ranked low, being found within the low 10% bracket with regard to the GII. The country scored very poorly with regard to institutions and infrastructure throughout the five years. It had a mean total inflow for infrastructure of $7.57 million during the 17 years from 2000 to 2016, compared to $738.90 million for the whole of

Figure 2. 22 Distribution of STI capacity levels across Africa 2016

Source: African Capacity Building Foundation 2017: 'African Capacity Report 2016': www.acbf-pact.org/

southern Africa (Figure 2.23). There was an improvement in human capital and research, as well as knowledge and technology outputs, with the country receiving relatively higher scores in both categories.

Table 3, Target 17: Profile of Zimbabwe's Global Innovative Index for 2014 to 2018

Figure 2.23 shows the marked differences in the range of the primary vertical axis (on the left) for Zimbabwe and that for southern Africa on the secondary (right) vertical axis.

The number of reseachers in Zimbabwe per million inhabitants in 2012 was 88.72, which was among the lowest 25% of 102 countries and regions across the globe (Figure 2.24). Thus, the number of researchers and funding were low for resilient infrastructure, promotion of inclusive and sustainable industrialization and nurturing of innovation.

2.17.2 Target 17 and its implementation

Although support for research has generally been low, innovative research has been conducted that addresses some of the threats to biodivesity that the country has faced over the last two decades. Some of the research covered the development of efficient tobacco curing barns to reduce the impact of the tobacco industry on forest cover,[164, 165, 166] conservation agriculture,167, 168 climate-smart agriculture[169] and biodiversity conservation.[170, 171]

A database on biodiversity expertise is still to be deveopled: the process has been held back for of lack of funding. Information sharing is therefore disaggregated as no central clearing house mechanism has been developed for easy access to biodiversity data or information.

There are 21 universities in Zimbabwe, of which 12 are State institutions. Most offer programmes that deal with various aspects of biodiversity, its conservation and its utilization for sustainable development. All the institutions periodically review and revise their programmes and develop new ones as new challenges and initiatives are identified.

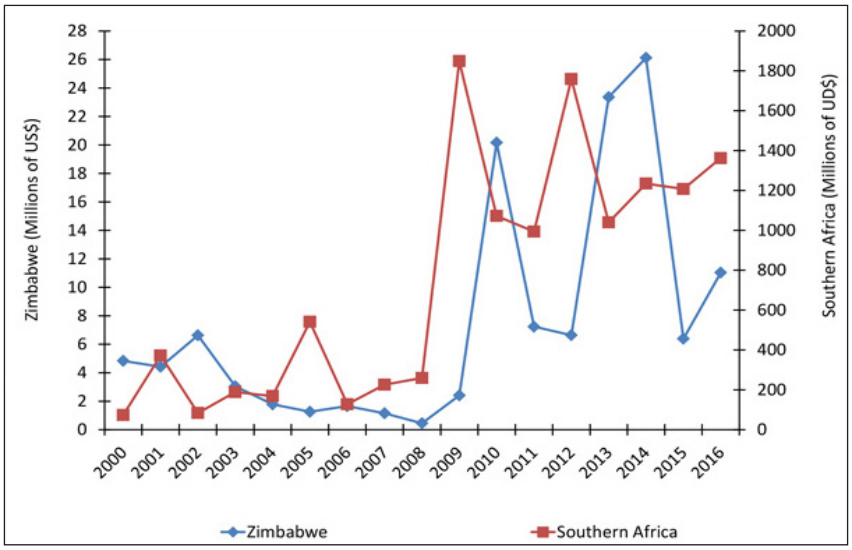
2.17.3 South-South cooperation

Zimbabwe is a member state of the Group of 77,[172] which is the largest intergovernmental organization of developing countries in the United Nations. It provides the means for the countries of the South to articulate and promote their collective economic interests and enhance their joint negotiating capacity on all major international economic issues within the UN system, and to promote South-South cooperation for development.[173] Zimbabwe is a member of the Consortium on Science, Technology and Innovation for the South (COSTIS) which was established by the Group of 77 member states to devise strategies and implement programmes for building STI capacity for economic growth and sustainable development.[174] In October 2010, the Group of 77 adopted the Multi-Year Plan of Action for South-South Cooperation on Biodiversity for Development.[175]

The Zimbabwe Academy of Sciences (ZAS), which is the focal institution for Zimbabwe on COSTIS, has not been effective in promoting the objectives of COSTIS due to chronic funding shortages and resource constraints. Historically, the ZAS has survived on donations and membership fees. Over the last decade ZAS has had fewer than 100 fellows and the country's economic distress has meant that fewer than 15 members paid their fees.[176]

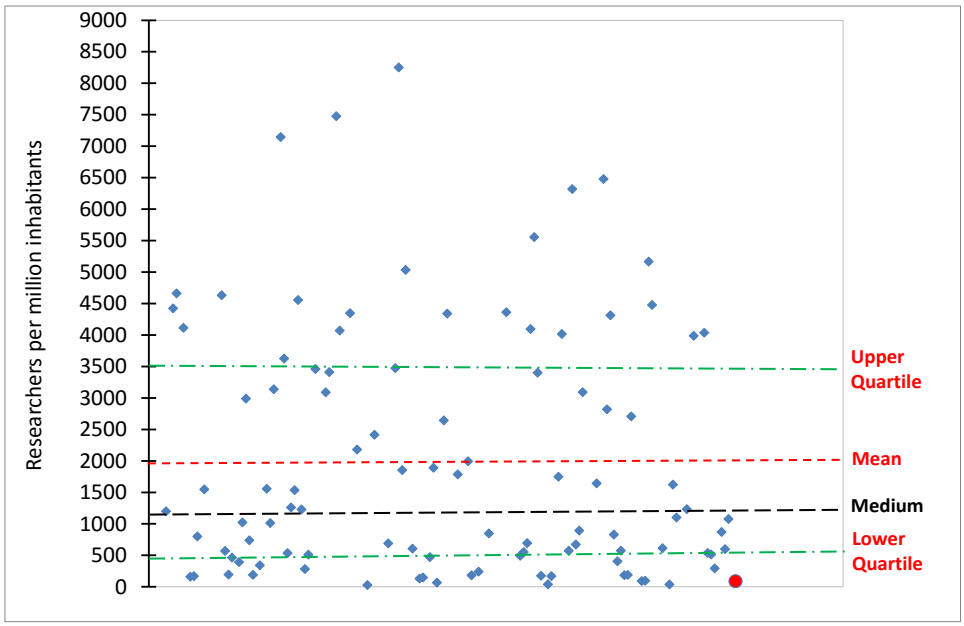
The objectives of the multi-year plan of action, which have been linked to general indicative activities and how Zimbabwe has implemented and supported South-South cooperation under the plan, are shown in Table 4, Target 17.

Figure 2. 23 Mean total official flows for infrastructure for Zimbabwe and southern Africa (millions of constant 2016 U.S.$)



Source: UN Statistics Division: https://unstats.un.org

Figure 2. 24 Researchers per million inhabitants (per 1,000,000 population) in 2012 (Zimbabwe represented by the red point)



Source: UN Statistics Division: https://unstats.un.org

Table 4, Target 17: The objectives of the Multi-Year Plan of Action for South-South Cooperation on Biodiversity for Development, its indicative activities and Zimbabwe's implementation and support of the plan

2.174 Global taxonomy initiative

The parties to the CBD agree that there is a 'taxonomic impediment' to implementation of the Convention due to the shortage of taxonomic expertise, taxonomic collections, field guides and other identification aids, as well as the difficulty of accessing existing taxonomic information.[177] The Global Taxonomy Initiative (GTI) is a programme of the CBD, which was developed by the parties to identify taxonomic needs and priorities. Its aims are to:

- Develop and strengthen human capacity to generate taxonomic information
- Develop and strengthen infrastructure and mechanisms for generating taxonomic information, and for facilitating sharing of and access to that information
- Provide taxonomic information needed for decision making regarding the conservation of biological diversity, sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources

The CBD sees taxonomy as being important for all types of ecosystems, and therefore the GTI is a cross-cutting issue applicable to all of the work under the Convention. It is specifically intended to support implementation of the work programmes of the Convention on its thematic and cross-cutting issues.[178] The objectives of the GTI, planned activities and progress on implementation by Zimbabwe are shown in Table 5, Target 17.

Table 5, Target 17: The objectives of the GTI, planned activities and Zimbabwe's implementation of the initiative

2.17.5 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

Zimbabwe has been a member of since April 2012. The platform is an independent intergovernmental body that was established in 2012 with a mission to strengthen knowledge foundations for better policy through science, for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development.[179] It provides policymakers with objective scientific assessments about the state of knowledge regarding the planet's biodiversity and ecosystems and the benefits they provide to people, as well as the tools and methods to protect and sustainably use these vital natural assets.

2.17.6 Effectiveness of the implementation measures for Target 17

The measures implemented for Target 17 have been partly effective. Although funding for research in Zimbabwe has been relatively low over the last two decades and the country has lost a substantial portion of its experienced personnel, some innovative research has been carried out. Zimbabwe has also participated in a number of international platforms – South-South cooperation and the Global Biodiversity Information

Facility, for instance – which have enabled building and strengthening networks of cooperation as well as the building of human resources.

2.17.7 Obstacles encountered in implementation of Target 17

The severe economic challenges in Zimbabwe over the last decade has affected the implementation of Target 17. There has been limited investment in infrastructure such that specialized equipment required for environmental and biodiversity conservation is largely unavailable or obsolete. Furthermore, the country has experienced high levels of trained human capital flight.

2.17.7 Scientific and technical needs for Target 17

- Investment in infrastructure and equipment required for conducting environmental and biodiversity research
- Funding for research
- Training of taxonomists to cover the broad spectrum of biological organisms

TARGET 18: By 2020, mechanisms for resource mobilization and accounting are established and financial resources from national budgets and other sources for the implementation of the NBSAP are increased from current levels

It is widely acknowledged that addressing the ongoing loss of global biodiversity requires a substantial increase in funding for conservation activities, particularly in developing countries. Target 18 therefore seeks to address resource mobilization for biodiversity conservation activities in Zimbabwe through two strategies and five activities (Table 1, Target 18).

2.18.1 Sustainable financing

2.18.1.1 Government funding

The desired outcome for Target 18 will be an increase in financial resources, especially from the national budget, for the implementation of NBSAP. A key measure proposed was to conduct a private-public income and expenditure review for biodiversity, which would then be used in drafting an implementation framework for a payment scheme for ecosystem services. There has been no progress on this aspect of NBSAP2. Neither has there been progress on establishing an independent, multi-stakeholder institution to manage an environmental fund.

The budgetary allocation to the Ministry of Environment, Tourism and Hospitality Industry has fluctuated substantially since 2012 (Figure 2.25). There was a considerable increase in allocation to the ministry from 2012, when it received about 0.26% of total government expenditure, to 2014 when its allocation was 2.27%. The 2014 high in allocation was followed by a considerable decrease in the three years from 2015 to 2017, with less than 1% of the total budget allocated to the ministry in both 2016 and 2017. In 2016, the ministry's allocation was 0.75% of total government expenditure, which rose marginally to 0.80%, or $40.1 million, in 2017 (Figure 2.25). In 2018, the allocation was increased by 114% to more than $85 million, or about 1.6% of total government expenditure.[180] The 2019 allocation is substantially reduced, making up only 0.36% of the total budget.

Table 1, Target 18: The strategies, actions and indicators for Target 18 and summary comments on progress on implementation

2.18.1.2 Official development financing from OECD Development Assistance Committee member countries

Total official development financing (ODF) received by Zimbabwe since 2008 has fluctuated between $550 million and $950 million, with the highest amount of $925.6 million received in 2012 (Figure 2.26). There was an increase in the ODF received by the country from 2008 to 2012, but there has been a gradual decrease since then.

Figure 2.27 shows the trend in aid from OECD Development Assistance Committee (DAC) member countries to Zimbabwe that targeted biodiversity as a principal and significant objective. Official development finance activities on the DAC credit reporting system are screened and 'marked' as: targeting the conventions as a 'principal' objective; or as a 'significant' objective; or not targeting the objective.[181] An activity is marked as 'principal' when the objective (climate change mitigation, climate change adaptation, biodiversity or combating desertification) is explicitly stated as fundamental in the design of, or the motivation for, the activity, and is thus one of the principal reasons for undertaking the activity. An activity is described as 'significant' when the objective is explicitly stated but is not the fundamental driver or motivation for undertaking and designing the activity. The activity has other prime objectives but has been formulated or adjusted to help meet the relevant environmental concerns.

OECD DAC financial assistance to Zimbabwe, with biodiversity as the 'principal objective', was relatively low from 2010 to 2015, averaging less than $1 million annually, but there a sharp increase to $15.75 million in 2016 (Figure 2.27). DAC support for activities in which biodiversity was not the fundamental driver or motivation (or 'significant' objective), but would help in addressing some of aspects of biodiversity conservation, averaged approximately $12.88 million annually between 2010 and 2016, with a general decrease in support over the period. Overall finance assistance for activities in which biodiversity was the principal and significant objective was greater than $10 million annually, except in 2012 and 2015 in which it was less than $5 million. The total amount over the seven years was approximately $111.04 million at an average of $15.86 million annually.

2.18.1.3 Funding through the Global Environmental Facility

Between 1991 and 2018, 42 projects involving Zimbabwe were approved by the GEF. From 1991 to 2000, eight projects were approved, while 14 were approved from 2001 to 2010 and 20 from 2011 to 2018. Total financial support received from GEF-approved projects in which Zimbabwe was the sole beneficiary was $5.14 million from 1996 to 2010, but rose sharply to $103.89 million between 2011 and 2018 (Figure 2.28).

2.18.2 Making a business case for biodiversity

The actions proposed under this strategic item were to carry out an assessment of the economic value of ecosystem services and the sensitization of stakeholders at all levels across all sectors on the value of biodiversity. An economic evaluation of ecosystems services is still outstanding largely due to lack of funding and expertise. Raising awareness and sensitizing of stakeholders about the value of biodiversity are ongoing activities that are carried out by a number of institutions and organizations across the country (see Target 1).

Communal lands and privately owned land play an increasingly important role in biodiversity conservation and utilization in Zimbabwe. According to the Arusha Conference of 1961, it is only through planned utilization of wildlife as a renewable natural resource, either for protein or as a recreational attraction, that wildlife conservation and development can be economically justified in competition with agriculture, stock ranching and other forms of land use.[182] In the 1970s, Zimbabwe adopted the Arusha principle and in 1975 passed the Parks and Wildlife Act, which enabled private landholders to use the wildlife on their lands commercially. In 1982, the legal provisions of the Act were extended to rural communities on communal lands, through rural district councils, which was the beginning of the CAMPFIRE programme. There are at least five officially recognized conservancies in Zimbabwe (see Target 9).

2.18.3 Effectiveness of the implementation measures for Target 18

The measures implemented for Target 13 have been partly effective. The allocation from Treasury for bio-

Figure 2. 25 Budgetary allocation to Ministry of Environment, Tourism and Hospitality Industry as a percentage of total budget

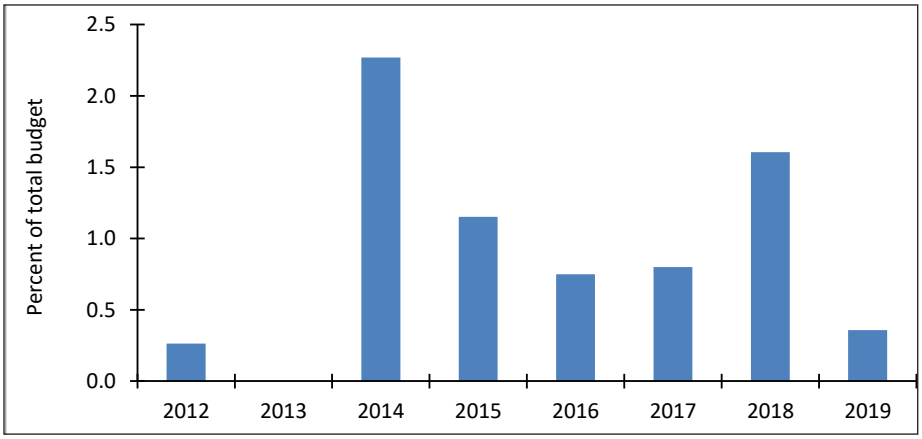
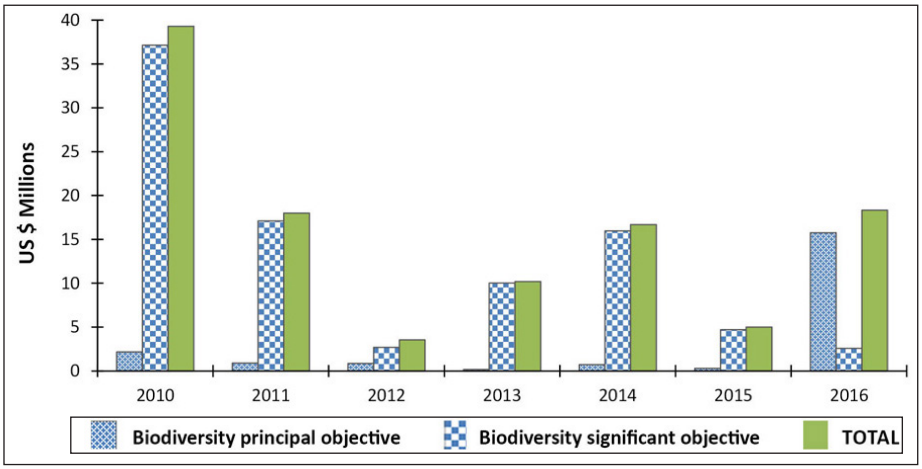
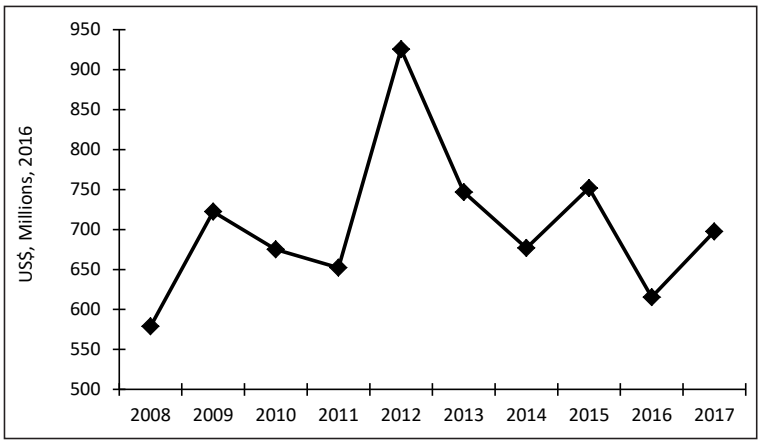


Figure 2. 26 Total official development financing (ODF) to Zimbabwe between 2008 and 2017



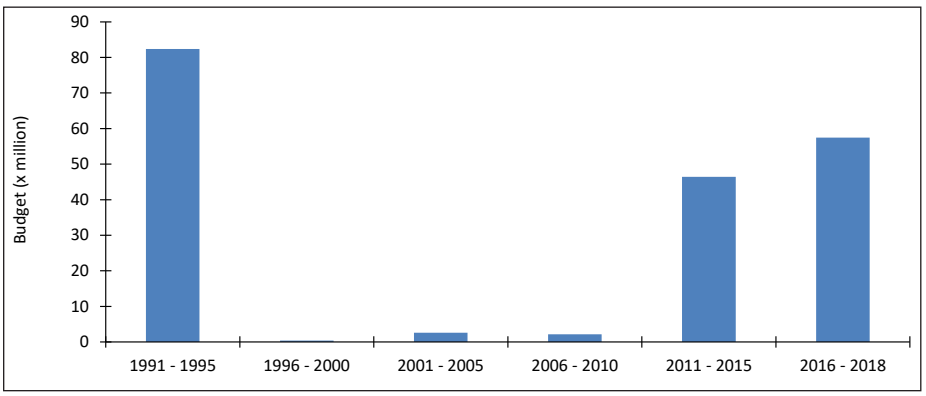
Source: OECD: https://stats.oecd.org/

Figure 2. 27 Aid from DAC member countries to Zimbabwe targeting biodiversity



Source: OECD: https://stats.oecd.org/

Figure 2. 28 Budgetary allocations for GEF-approved projects in which Zimbabwe was the sole beneficiary



Source: GEF: www.thegef.org/projects, accessed 12 November 2018

diversity conservation has been consistently low and there has been no review of investment by other sectors towards biodiversity and no progress on reporting biodiversity business in national accounts and economic planning frameworks. Funding for biodiversity activities from external sources such as the GEF and OECD has been relatively high.

2.18.4 Obstacles encountered in implementation of Target 18

The economic challenges in Zimbabwe over the last two decades affected the country's ability to implement Target 18.

2.18.5 Scientific and technical needs for Target 18: Training in writing of proposals for accessing funding from international funding agencies.

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SECTION III: Assessment of progress towards each national target

3.1 **Target 1**: By 2020, at least 75% of the population is aware of the values of biodiversity and the steps they can take to conserve and use it sustainably

Progress towards implementation						**Evidence used for assessment**	**Indicators used**	**Level of confidence of assessment**			**Adequacy of monitoring information to support assessment**				**Monitoring system**
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target	• There are many organizations in the country involved in raising awareness of values of biodiversity and its sustainable utilization • A variety of communication methods are used to disseminate the information, ensuring extensive outreach	• Number and extent of reach of the organizations involved in biodiversity awareness • Methods and extent of reach of communication modes used • Extent of incorporation of biodiversity into school curricula	Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	• The EMA has a monitoring system and reports its findings • There is need to identify appropriate indicators, develop and fully implement a monitoring system that will be implemented by a number of organizations • There is need to identify and capacitate institutions that will carry out systematic and regular monitoring of indicators

3.2 Target 2: By 2020, biodiversity is mainstreamed into all seven sectors (mining, agriculture, health, manufacturing, transport, energy and education) and incorporated into national accounting and reporting systems

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring system
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target			Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	
			✓			• Progress in developing a biodiversity policy • The extent to which biodiversity and environmental issues are acknowledged and reflected within the policy framework • Government support for biodiversity-related programmes and projects • Environmental reporting by industry	• Biodiversity policy document or draft document • The number of the country's policies that acknowledge the value of biodiversity and environmental conservation • The number of large-scale biodiversity and environmental conservation programmes receiving government support • The number of companies on the Zimbabwe Stock Exchange and the extent to which they incorporate environmental reporting in their 2017 annual reports			✓		✓			There is no systematic monitoring in place for the target

3.3 Target 3: By 2020, reduce the rate of loss of natural habitats including forests by at least 50%

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring system
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target	• Forest cover • Access to electricity • Growth of tobacco industry • Implementation of the national fire protection strategy • Capacity building programmes for local authorities, law enforcement agencies and other institutions on aspects of biodiversity • Waste management and pollution • Support for community-based natural resources enterprises • Promotion and support for use of sustainable renewable energy sources	• Trend in forest cover • Trend in proportion of population with access to electricity • Trend in number of tobacco growers • Trends in fire incidence and area burnt • Waste collection and management levels • Capacity building initiatives for local authorities and law enforcement agencies • Number of programmes supporting community-based natural resources enterprises • The number of renewable energy initiatives that have been commissioned and are being planned	Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	• EMA monitors pollution; ZPWMA monitors poaching activities and levels; Forestry Commission monitors forest coverage and degradation • There is need to fully capacitate the institutions to enhance their effectiveness in implementing their mandates

3.4 **Target 4:** By 2020, ecosystem-based approaches to aquatic resources management are being applied on Lake Kariba and other water bodies to avoid overfishing, enable the recovery of fish stocks, and reduce loss of indigenous species

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring system
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target			Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	
			✓			• The state of the kapenta fisheries on Lake Kariba • Progress towards the development of fisheries and aquaculture policy • Implementation of international guidelines for securing small-scale fisheries • The state of fisheries co-management structures • Aquaculture and the spread of invasive alien species	• The number of kapenta fishing rigs, the fishing effort, and kapenta catches on Lake Kariba • Availability of fisheries and aquaculture policy or draft policy • Level of implementation of international guidelines on securing small-scale fisheries • The state of fisheries co-management structures • Level of promotion and support of indigenous fish species for aquaculture		✓				✓		• Monitoring of kapenta and gill net fishing on Lake Kariba is done by the ZPWMA • No monitoring system for fisheries on most other water bodies outside the National Parks estates • There is no monitoring system of the spread and impacts of the Nile tilapia (*O. niloticus*) that is being promoted for aquaculture • Limited monitoring of other alien species such as Australian red claw crayfish (*Cherax quadricarinatus*), *Azolla filiculoides* and *Limnobium laevigatum*

3.5 Target 5: By 2020, 60% of areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity and sustainable land use

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring system
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target			Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	
						• Reports on the adoption of conservation agriculture • Programmes to address land degradation • Progress in identifying key biodiversity areas • Conservation actions and their results in KBA	• Level of adoption of conservation agriculture • Number of programmes addressing land degradation • Inventory on KBAs • The number of KBAs classified as having high-level action being taken to conserve sites							• Monitoring of agricultural activities is done under the Ministry of Agriculture • Aquaculture activities are monitored by ZPWMA • Forestry Commission monitors forestry activities • There is need to enhance the capacity of the monitoring institutions

3.6 Target 6: By 2020, integrated pollution prevention and control strategies are in place to reduce detrimental effects to ecosystem function and biodiversity

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring System
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target	• Environmental performance profiles • Pollution prevention activities	• Environmental performance indices (EPIs) • Number of pollution prevention activities being implemented	Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	• EMA has monitoring systems in place • There is a need to enhance institutional capacity, especially through upgrading of equipment

3.7 Target 7: By 2020, the threats to biodiversity from invasive alien species have been assessed, and measures put in place to control and manage their impact

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring system
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target			Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	
						• The alien species list in Zimbabwe • Progress on developing and implementing management plans for control of priority invasive alien species • Invasive alien species (IAS) policy	• Number of alien species and possible IAS in Zimbabwe being monitored • Number of invasive alien species and possible invasive alien species with management or control and eradication plan • Progress on developing invasive alien species policy							• EMA, Forestry Commission, the National Herbarium, Plant Quarantine Services Institute and Plant Protection Research Institute have monitoring programmes for some IAS • There is a need to develop a national policy and plans on IAS • Many more alien species occur in the country than those being monitored. There is a need to undertake risk analyses of the potentially invasive species

3.8 Target 8: By 2020, adaptation and mitigation strategies are implemented to reduce the impact of climate change on vulnerable ecosystems and communities

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring system
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target	• Zimbabwe's disaster risk profile • Zimbabwe's disaster risk management • Ecosystem-based adaptation and mitigation programmes • Climate change vulnerability assessments • Value of ecosystems and environmental planning for climate change adaptation • Research and development and promotion of drought- and heat-tolerant crop and livestock varieties • Poaching in protected areas	• Zimbabwe's INFORM risk index • Progress towards developing a risk reduction strategy that incorporates biodiversity conservation action • Number of large-scale adaptation and mitigation programmes • Number of KBAs and species that have been assessed for vulnerability to climate change • Number of environmental plans that include value of ecosystems to adaptation • Research into and the extent of promotion of drought- and heat-tolerant crop varieties and animal breeds • Anti-poaching activities and statistics on poaching of major wildlife species	Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	The annual Zimbabwe Vulnerability Assessment (ZimVac) monitors vulnerability of communities, but a similarly extensive monitoring system for ecosystems has not been implemented

Target 9: By 2020, at least 28% of Zimbabwe's terrestrial and inland water under protection is maintained and conserved, and protected area connectivity enhanced through integrated resource management

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring system
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target	• Protected areas representativeness • Protected area connectedness • Protected area coverage of KBAs • Effective management of protected areas • Initiatives towards developing of community conservation areas	• Trend in protected areas representativeness index • Trend in protected areas connectedness index • Number of KBAs covered under protected areas • Number of protected areas that have been assessed for effective management and results of the assessments • Number of community conservation areas initiated or under consideration	Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	ZPWMA has monitoring systems for the protected area network

3.10 **Target 10:** By 2020 the loss of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring system
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target			Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	
						• Threatened (critically endangered, endangered and vulnerable) plant and animal species	• Number of threatened species with species conservation and management plans • Number of threatened species with stable or increasing population trends								• ZPWMA, the National Herbarium and BirdLife Zimbabwe have monitoring systems • There is a need to capacitate the institutions so as to enhance their monitoring activities

3.11 **Target 11:** By 2020, develop and implement strategies to conserve and maintain cultivated, farmed and domesticated genetic resources and their wild relatives, including other socioeconomically and culturally valuable species

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring systems
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target			Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	
				✓		• Cultivated crop and livestock production • Information on cultivated plants and farmed animals • Establishment of plant and animal gene banks • Public awareness of biosafety • Promotion of market-driven strategies for local crop and livestock varieties	• Trends in the production of some cultivated crops and farmed animals • Availability of or progress towards establishing a database on cultivated plants and farmed animals • Availability of fully equipped and functional plant and animal gene banks • Information and score on the knowledge, attitude and practices of biosafety among stakeholders • Programmes enhancing success of small-scale farmers producing local crop and animal varieties			✓				✓	The Ministry of Agriculture has monitoring systems for agricultural activities, production and resources

3.12 **Target 12**: By 2020, implement policies and strategies to maintain and restore ecosystem integrity, and reduce ecosystems degradation to enhance the livelihoods and well-being of all Zimbabweans, especially those of women, indigenous and local communities, and the poor and vulnerable

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring systems
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target			Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	
						• Human development profile for Zimbabwe • Income-generating programmes that promote sustainable utilization of biodiversity and ecosystems, and support the establishment of public-private-community partnerships (PPCPs) for viable biodiversity-based businesses	• Human Development Index • Gender Development Index • Gender Inequality Index • Multidimensional Poverty Index • Number of large-scale programmes that promote and support the establishment of sustainable biodiversity-based businesses based on the PPCP model							• The EMA has been monitoring the statutes of ecosystems • ZimStats has monitoring systems for livelihoods and poverty

3.13 Target 13: By 2020, combat desertification, and enhance ecosystem resilience through conservation and restoration of degraded ecosystems

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring systems
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target			Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	
						• Forest cover • Access to improved water sources • Initiatives to combat ecosystem degradation • Key biodiversity areas	• Forest cover change • Trend in access to improved water sources • Number and extent of initiatives to combat degradation • Trend in protected areas coverage							• EMA has been monitoring the status of ecosystems across the country • Forestry Commission monitors the state of forests, and ZPWMA the state of national parks

3.14 Target 14: By 2015, accede and domesticate the Nagoya Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring systems
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target			Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	
				✓		• Capacity building on access and benefits sharing (ABS) • Negotiations at all levels and entry points (contracts, traditional knowledge) • Finalization appropriate instruments for accession and domestication • Promotion of awareness on provisions of ABS instruments	• Number of meetings or workshops in each province • Acceptance of the protocol by Zimbabwe • Awareness campaigns on the protocol			✓			✓		There is no systematic monitoring in place for the target

3.15 Target 15: By 2015, NBSAP updated and adopted as a policy instrument, and implementation has commenced

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring systems
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target			Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	
						• NBSAP2 adoption • Sensitization of heads of ministry departments on the NBSAP • Integration of NBSAP2 implementation into the national budget • Monitoring and evaluation framework for NBSAP2 • Implementation and coordination structures for NBSAP2 • NBSAP2 implementation and resource mobilization in place • Facilitation of the development of projects and programmes by stakeholders that address the objectives of NBSAP2	• NBSAP2 adoption • Number of sensitization workshops • Amount from treasury allocated for implementation of the NBSAP • Annual NBSAP progress reports • NBF active and fully funded • Implementation and resource mobilization in place • The number of biodiversity-related projects facilitated and that are linked and address the objectives of NBSAP2							• There is no systematic monitoring in place for the target • There is a need to identify appropriate indicators and develop and fully implement a monitoring system • There is a need to identify institutions that will be fully capacitated to carry out systematic and regular monitoring and reporting on indicators

3.16 Target 16: By 2020, the traditional knowledge, innovations and practices of local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected and integrated and reflected in the implementation of the NBSAP with the full and effective participation of local communities, at all relevant levels

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring systems
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target			Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	
			✓			• Review of existing local and community-based environmental structures to incorporate biodiversity issues • Review of whether local communities are being empowered to develop and implement local environment plans (LEAPs) • Recognition, establishment and strengthening of indigenous and community-conserved areas (ICCAs) • Documentation of values, taboos and customary and traditional knowledge relevant to the conservation and sustainable use of biodiversity • Awareness on indigenous knowledge and access and benefit sharing (ABS) • Integration of indigenous knowledge systems into national biodiversity policies and programmes	• Functional local community environmental structures in place in each district • Number of local authorities trained in developing LEAPs • The number of ICCAs established or strengthened • National report • KAP score of at least 80% demonstrating the linkage of indigenous knowledge to ABS • Number of indigenous knowledge systems-related mechanisms and innovations			✓			✓			• There is no systematic monitoring in place for the target. • There is a need to identify appropriate indicators and develop and fully implement a monitoring system • There is a need to identify institutions that will be fully capacitated to carry out systematic and regular monitoring and reporting on indicators

3.17 **Target 17:** By 2020, science, technology and innovation relating to biodiversity, its values, functioning, status and trends and the consequences of its loss, are strengthened, improved, widely shared, transferred, and applied

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring systems
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target	• Investments in the development and application of innovative technologies for managing the major threats to biodiversity loss • Assessment of gaps in biodiversity expertise • Assessment of tertiary institutions curricula • Capacity in ecosystems evaluations	• Trend in investment • Research and development for innovations that address threats to biodiversity • Database on biodiversity expertise • Range of programmes that focus on biodiversity which are offered at tertiary institutions • The number and level of training on ecosystems evaluations held annually	Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	• There is no systematic monitoring in place for the target. • There is a need to identify appropriate indicators and develop and fully implement a monitoring system • There is a need to identify institutions that will be fully capacitated to carry out systematic and regular monitoring and reporting on indicators

3.18 Target 18: By 2020, mechanisms for resource mobilization and accounting are established and financial resources from national budgets and other sources for the implementation of the NBSAP increased from current levels

Progress towards implementation						Evidence used for assessment	Indicators used	Level of confidence of assessment			Adequacy of monitoring information to support assessment				Monitoring systems
Unknown	Moving away from target	No significant change	Progress but at an insufficient rate	On track to achieve target	On track to exceed target	• Private-public income and expenditure review for biodiversity and recommendations framework for implementing payment for ecosystem services (PES) • Access to environmental fund • Biodiversity and environmental finance received through global initiatives such as the Global Environment Facility (GEF) • Budgetary allocation from treasury to the Ministry of Environment, Tourism and Hospitality Industry (METHI) • Investment by other sectors towards biodiversity	• Private-public income and expenditure review report • Framework for implementing PES • Amount received from environmental fund to finance biodiversity programmes • Trend in number of projects and amounts received through global initiatives • Trend in the budget allocated to the METHI • Percent change in investment towards biodiversity by other sectors	Based on limited evidence	Based on partial evidence	Based on comprehensive evidence	Monitoring is not needed	No monitoring system in place	Monitoring is partial	Monitoring is adequate	• There is no systematic monitoring in place for the target. • There is a need to identify appropriate indicators and develop and fully implement a monitoring system • There is a need to identify institutions that will be fully capacitated to carry out systematic and regular monitoring and reporting on indicators

SECTION IV: Zimbabwe's contribution to the achievement of the Aichi Biodiversity Targets and the Sustainable Development Goals

Aichi Biodiversity Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably

Zimbabwe's National Target 1: By 2020, at least 75% of the population is aware of the values of biodiversity and the steps they can take to conserve and use it sustainably

Zimbabwe's contribution to the achievement of ABT 1	SDG supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is high. The Global Innovative Index for 2017 and 2018 ranked Zimbabwe's education as one of its strengths (see section 2.17.1.1, Target 17). The curriculum for primary and secondary education which came into effect in January 2017 encompasses and promotes sustainable development, appreciation of cultural diversity and peace. Thus, children from an early age are being made aware of the values of biodiversity and the steps needed to conserve and use it sustainably. Programmes such as the Eco-Schools Programme have also contributed to achievement of ABT1	**4**	**4.7** Education for sustainable development	• Support for implementation of SDG4 and 12 is high • About 39% of Zimbabwe's population is 14 years and younger and 20% are aged between 15 and 24 years.[1] Secondary education is usually completed between the ages of 16 and 18 years. The new primary and secondary school curriculum, which targets more than 50% of the country's population, strongly supports the components of sustainable development and sustainable lifestyles within SDG 4 and 12. • Information on sustainable development and lifestyles is widely available through various environmental awareness commemorations, shows and programmes by both government departments NGOs (see Target 1)
	12	**12.8** Awareness of sustainable development	
For the period 1996-2017, Zimbabwe was ranked 97 out of 239 countries globally, for all scientific subject areas on the *SCImago Journal and Country Rank*.[2] Among 57 African countries, the country was ranked 12th for all subject areas. With respect to environmental sciences, Zimbabwe was ranked 86 out of 231 countries globally, and 12th among 56 African countries. Thus, the research and publications in environmental sciences undertaken in Zimbabwe contributed to ABT1 at national, regional and global levels	**4 and 12**	As a above	Zimbabwe has contributed through research and publications to generation knowledge on environmental issues, some of which addressed aspects covered with SDG 4 and 12

[1] *CIA World Fact Book*: www.cia.gov/, accessed I January 2019

[2] *SCImago Journal & Country Rank*: www.scimagojr.com, accessed I January 2019

Aichi Biodiversity Target 2: By 2020 at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting and reporting systems

Zimbabwe's National Target 2: By 2020, biodiversity is mainstreamed into all seven sectors (mining, agriculture, health, manufacturing, transport, energy and education) and incorporated into national accounting and reporting systems

Zimbabwe's contribution to the achievement of ABT 2	SDG supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is high. Its policy, legislative and regulatory frameworks acknowledge the importance of biodiversity conservation in enhancing sustainable development and sustainable lifestyles. The protection of the environment to ensure health and well-being is a principal right afforded to all Zimbabweans by the Constitution	8	**8.4** Decouple growth from environmental degradation	• Support for implementation of SDGs 8, 9, 16, and 17 is high • The Environmental Management Act [Chapter 20:27] integrates and links ABT 2 to components of SDGs 8, 9, 15 and 17. According to the Act, the principles that apply to all actions which significantly affect the environment are: ▪ All elements of the environment are linked and thus environmental management must be integrated and the best practicable environmental option pursued ▪ Environmental management must place people and their needs at the forefront ▪ Participation of all interested and affected parties in environmental governance must be promoted ▪ Environmental education, environmental awareness and the sharing of knowledge and experience must be promoted ▪ Development must be socially, environmentally and economically sustainable ▪ Harm to the environment and infringements of people's environmental rights shall be prevented; where they cannot be altogether prevented, be minimized and remedied ▪ Any person who causes pollution or environmental degradation shall meet the cost of remedying such pollution or environmental degradation ▪ Global and international responsibilities relating to the environment must be discharged in the national interest; furthermore, the Act requires EIAs before a major project commences
		8.9 Promote sustainable tourism	
	9	**9.1** Resilient infrastructure for development	
		9.2 Sustainable industrialization	
		9.4 Retrofit industries for efficiencies and technology	
	15	**15.9** Integrate biodiversity values into national planning and poverty reduction	
	17	**1714** Enhance policy coherence for sustainable development	One of the main processes that will be done through the Transitional Stabilisation Programme reforms agenda (2018-2020) will be alignment of the statutes with the Constitution, which will enhance policy consistency with regard to sustainable development

Aichi Biodiversity Target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions

Aichi Biodiversity Target 4: By 2020, at the latest, governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for SPC and have kept the impacts of use of natural resources well within safe ecological limits.

*Zimbabwe did not develop targets for ABTs 3 & 4 in the NBSAP2

Aichi Biodiversity Target 5: By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation are significantly reduced

Zimbabwe's National Target 3: By 2020, reduce the rate of loss of natural habitats, including forests, by at least 50%

Zimbabwe's contribution to the achievement of ABT 5	SDG supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is high. Although over the last decade Zimbabwe has been under severe economic distress, it has managed to invest in as well as support programmes towards curtailing habitat loss	7	**7.1** Universal access to reliable energy	• Support for implementation of SDGs 7, 12, 13, and 15 is high • The policy and legal framework of Zimbabwe espouses environmental protection and biodiversity conservation A number of public and private renewable energy initiatives are being promoted (see Target 3) • A number of other initiatives have been promoted and implemented including: ▪ Supporting Enhanced Climate Action for Low Carbon and Climate Resilient Development Pathway (SECA-LCCRDP)[1] ▪ Support towards Implementing Zimbabwe's Nationally Determined Contributions (NDC)[1] ▪ Solar Sisters Programme[1] ▪ Sustainable forest management project[2] ▪ Wetland ecosystem goods and services project[2] ▪ Piloting biogas in the mid-Zambezi[2]
		7.2 Increase renewable energy	
	12	**12.2** Sustainable management of natural resources	
	13	**13.1** Strengthen resilience and adaptation to disasters	
	15	**15.1** Ensure conservation, restoration, sustainable use of ecosystems and services	
		15.2 Sustainably manage forests, restore forests	
		15.3 Combat desertification, restore degraded land	
		15.4 Conserve mountain ecosystems	
		15.5 Reduce degradation of habitats, halt biodiversity loss, prevent extinctions	
		15.9 Integrate biodiversity values into national planning, poverty reduction	

[1] METHI Climate Change Management Department: www.climatechange.org.zw

[2] WWF Zimbabwe: http://zimbabwe.panda.org

Aichi Biodiversity Target 6: By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits

Zimbabwe's National Target 4: By 2020, ecosystem-based approaches to aquatic resources management are being applied on Lake Kariba and other water bodies so as to avoid overfishing, enable the recovery of fish stocks and reduce loss of indigenous species

Zimbabwe's contribution to the achievement of ABT 6	SDG supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is high. Through the command fisheries and aquaculture programme Zimbabwe is promoting and increasing its investment in fisheries and aquaculture in water bodies across the country. The programme aims at enhancing livelihoods opportunities, especially for the poor and vulnerable. Through the programme, conservation and sustainable utilization of aquatic resources has become a topical issue	1	**14** Equal rights to services, economic resources	• Support for implementation of SDGs 1, 2, and 15 • Although the involvement of women in fisheries activities, especially owning fishing gear and fishing permits, has been negligible largely due to cultural hindrances and gender stereotypes, women have been actively involved in post-harvest activities such as fish processing and marketing. There have been some initiatives to promote full participation of women in the industry[1]
		15 Build resilience of poor to climate, shocks	Fishing enhances the livelihoods of households, especially since some also practice agricultural activities. According to Ndhlovu et al, sensitivity to climate change by fishers in fishing villages on Lake Kariba is reduced as they are also involved in crop farming[2]
	2	**21** End hunger, especially for vulnerable	
		22 End malnutrition	
		24 Ensure sustainable food production; maintain key ecosystems	
	15	**151** Ensure conservation, restoration, sustainable use of ecosystems and services	See Targets 2 and 6
		155 Reduce degradation of habitats, halt biodiversity loss, prevent extinctions	
		159 Integrate biodiversity values into national planning, poverty reduction	

[1] UN Women 2012: www.unwomen.org/en/news/stories/2012/3/binga-women-in-zimbabwe-make-history-on-the-zambezi-river, accessed I January 2019

[2] Ndhlovu N., Saito O., Djalante R. and Yagi N. 2017. 'Assessing the sensitivity of small-scale fishery groups to climate change in Lake Kariba, Zimbabwe 2017': doi:103390/su9122209; www.mdpi.com/journal/sustainability

Aichi Biodiversity Target 7: By 2020, areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity

Zimbabwe's National Target 5: By 2020, 60% of areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity and sustainable land use

Zimbabwe's contribution to the achievement of ABT 7	SDG supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is high. One of the objectives of the Transitional Stabilization Programme reforms agenda (TSP) is to enhance environmental management by the following: protection, restoration and promotion of sustainable use of terrestrial ecosystems; sustainable management of forests; combating desertification; and halting and reversing land degradation and biodiversity loss. The national agriculture policy framework promotes balanced exploitation of agricultural land and its environs to grow the economy and sustain livelihoods with the sustainable use and renewal of environmental ecosystem services. Generally, the policy and legal framework of Zimbabwe aims at enhancing environmental protection and sustainable exploitation of natural resources	2	**2.1** End hunger, especially for vulnerable	• Support for implementation of SDGs 2, 12 and 15 is high • A number of programmes and initiatives have been promoted and some are ongoing, including: ▪ Zimbabwe United Nations Development Assistance Framework ▪ Command agriculture programme ▪ Supporting enhanced climate action for low carbon and climate resilient development pathway (SECA-LCCRDP) ▪ The Zimbabwe Resilience Building Fund ▪ Strengthening biodiversity and ecosystems management and climate-smart landscapes in the mid to lower Zambezi region ▪ Sustainable afforestation programme by the Sustainable Afforestation Association
		2.4 Ensure sustainable food production; maintain key ecosystems	
		2.5 Maintain genetic diversity for agriculture and exploit traditional knowledge	
	12	**12.2** Sustainable management of natural resources	
	15	**15.1** Ensure conservation, restoration, sustainable use of ecosystems and services	
		15.2 Sustainably manage and restore forests	
		15.5 Reduce degradation of habitats, halt biodiversity loss and prevent extinctions	

Aichi Biodiversity Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity

Zimbabwe's National Target 6: By 2020, integrated pollution prevention and control strategies are in place to reduce detrimental effects to ecosystem function and biodiversity

Zimbabwe's contribution to the achievement of ABT 8	SDG supported		Extent of support towards the implementation of the SDGs
• Zimbabwe's contribution is high. Although over the last decade resources have been limited, Zimbabwe has had pollution prevention and control strategies in place. The Environmental Management Agency (EMA) has been coordinating a broad range of multisectoral initiatives in order to improve the national capacity for pollution prevention and control strategies and the conservation of the environment • Zimbabwe is an agro-based economy and the use of pesticides is widespread but has decreased. The country has a stringent pesticide registration scheme. All pesticides must be registered with the Pesticides Registration Office in the Ministry of Agriculture, which with CropLife Zimbabwe produces and updates handbooks listing all registered pesticides and their crop use recommendations[1,2]	3	**3.9** Reduce deaths from pollution	• Support for implementation of SDGs 3, 6, 11, and 12 is high • EMA is mandated to enforce environmental quality standards, which include water and air quality standards. It monitors and regulates the quality of effluent and emissions discharged into the environment, as well as use and disposal of hazardous substances • The Transitional Stabilisation Programme reforms agenda (TSP)seeks to enhance environmental management through protection, restoration and promotion of sustainable use of terrestrial ecosystems, sustainable management of forests, combating desertification, halting and reversing land degradation and biodiversity loss. A range of projects have been identified for implementation under the TSP so as to enhance the capacity of local authorities in waste collection, disposal and management, as well as in water and sanitation services
	6	**6.3** Reduce water pollution	
		6.5 Implement integrated water resource management	
		6.6 Protect and restore water-related ecosystems	
	11	**11.6** Reduce impacts of cities	
	12	**12.2** Sustainable management of natural resources	
		12.4 Sound management of chemicals	
		12.5 Reduce waste generation	

[1] www.croplife.co.zw

[2] wwwdrss.gov.zw

Aichi Biodiversity Target 9: By 2020, invasive alien species (IAS) and pathways are identified and prioritized, priority species are controlled or eradicated and measures are in place to manage pathways to prevent their introduction and establishment

Zimbabwe's National Target 7: By 2020, the threats to biodiversity from Invasive alien species have been assessed, and measures put in place to control and manage their impact

Zimbabwe's contribution to the achievement of ABT 9	SDG supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is moderate. Due to resource constraints there has been limited support towards the identification and mapping of the broad range of alien and possibly invasive species in Zimbabwe. There has been a substantial amount of work and focus on control and eradication of *Lantana camara*, *Opuntia fulgida* and *Eicchornia crassippes*, but relatively little attention to the distribution and impacts of other alien species. There is a need to map the distribution of other non-native species across the country and assess their impacts. An easily accessible national alien species database needs to be developed that will include identification tools as well as information on control and eradication measures for invasive species	15	**15.8** Prevent and reduce invasive alien species	• Moderate support for implementation of SDG 15 • Measures to prevent the spread and establishment of invasive alien species are in place. There is a need for enhanced focus on the distribution and impacts of the broad range of non-native species

Aichi Biodiversity Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning

Zimbabwe's National Target 8: By 2020, adaptation and mitigation strategies are implemented to reduce the impact of climate change on vulnerable ecosystems and communities

Zimbabwe's contribution to the achievement of ABT 10	SDG supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is high. Approximately 27% of Zimbabwe's land mass is under the protected areas network for the conservation of flora and fauna. Twenty key biodiversity areas have been identified, and on average 86% of each KBA is covered by protected areas. Furthermore, a number of programmes have been or are being initiated to minimize the impact of climate change on ecosystems and communities. These include: ▪ Strengthening biodiversity and ecosystems management and climate-smart landscapes in the mid to lower Zambezi region[1] Hwange Sanyati biological corridor project[2] ▪ Zimbabwe Resilience Building Fund[3] ▪ Coping with drought and climate change in Zimbabwe[4]	1	**1.1** Eradicate extreme poverty	Support for implementation of SDGs 1, 2, 3,11, 13, and 15 is high See Target 8
		1.3 Social protections for vulnerable	
		1.5 Build resilience of poor to climate, shocks	
	2	**2.1** End hunger, especially for vulnerable	
		2.4 Ensure sustainable food production; maintain key ecosystems	
		2.5 Maintain genetic diversity for agriculture, traditional knowledge	
	5	**5.1** End gender discrimination	
		5.5 Ensure women's participation	

[1] www.zw.undp.org

[2] http://zimbabwe.panda.org

[3] www.zrbf.co.zw

[4] www.adaptation-undp.org/

Aichi Biodiversity Target 10 (continued)
Zimbabwe's National Target 8

Zimbabwe's contribution to the achievement of ABT 10	SDG supported		Extent of support towards the implementation of the SDGs
	11	**11.4** Protected world's cultural, natural heritage	Zimbabwe has a rich and diverse cultural heritage. It is home to five world heritage sites, with many other cultural sites dotted across the country. It is now acknowledged that cultural heritage can support climate change adaptation efforts. One of the goals of the Ministry of Rural Development, Promotion and Preservation of National Culture and Heritage[5,6] is to improve preservation of national culture and heritage from 25% to 30% by 2018
	13	**13.1** Strengthen resilience and adaptation to disasters	See Target 8
		13.2 Incorporate climate change into national policies	
		13.3 Awareness and capacity on climate mitigation and adaptation	
	15	**15.1** Ensure conservation, restoration and sustainable use of ecosystems and services	Zimbabwe's Constitution affords every citizen the right to an environment that is not harmful to health or well-being, and calls for the enaction of legislative and other measures that prevent pollution and ecological damage. The policy and legislative framework is being aligned to ensure the protection of the environment for the realisation of environmental rights enshrined in the Constitution

[5] Before 2018, culture and heritage came under the Ministry of Rural Development, Promotion and Preservation of National Culture and Heritage; today they come under the Ministry of Home Affairs and Culture

[6] Ministry of Rural Development, Promotion and Preservation of National Culture and Heritage: www.ruraldev.gov.zw, accessed 31 December 2018

Aichi Biodiversity Target 11: By 2020, at least 17% of terrestrial and inland water areas and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated with the wider landscapes and seascapes

Zimbabwe's National Target 9: By 2020, at least 28% of Zimbabwe's terrestrial and inland water under protection is maintained and conserved, and protected area connectivity enhanced through integrated resource management

Zimbabwe's contribution to the achievement of ABT 11	SDG supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is high. A substantial area of the country is under the protected areas (PA) network, and at 27% of the country's area the PAs are greater than the global target of 17% for terrestrial areas	11	**11.3** Sustainable human settlement	• Support for implementation of SDGs 11, 12, and 13 is high • Zimbabwe PAs network conservation and management strategy is driven by the need to ensure sustainable development. It recognizes that PAs can contribute towards poverty reduction among the rural poor. Programmes such as CAMPFIRE and community conservation areas seek not only to preserve biodiversity and ecosystems, but to ensure local communities are able to sustainably use the resources • See Target 9
		11.4 Protected world's cultural and natural heritage	
	12	**12.2** Sustainable management of natural resources	
	15	**15.1** Ensure conservation, restoration and sustainable use of ecosystems and services	
		15.5 Reduce degradation of habitats, halt biodiversity loss and prevent extinctions	
		15.7 End poaching and trafficking of protected species	

Aichi Biodiversity Target 12: By 2020, the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained

Zimbabwe's National Target 10: By 2020 the loss of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained

Zimbabwe's contribution to the achievement of ABT 12	SDGs supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is high. The population status and trends in of a number of plant and animal species listed in the IUCN Red List of threatened species as critically endangered, endangered or vulnerable are known in Zimbabwe through its conservation programmes. Zimbabwe has over the last two decades managed to reverse the decline in elephant, lion and rhino populations, which in many range states are still declining. This has largely been due to effective conservation measures that have included high levels of investment in anti-poaching activities	14	**14.4** End overfishing and illegal, destructive fishing	• Support for implementation of SDGs 14 and 15 is high. • Zimbabwe's two most recent development policy frameworks and strategies, ZimAsset and the TSP reforms agenda, have promoted environmental protection and the prevention of biodiversity loss. The strengthening of key institutions such as the Environmental Management Agency, Parks and Wildlife Management and the Forestry Commission was identified as essential for enhancing environmental and biodiversity conservation. Furthermore, the TSP acknowledges the importance of enhancing viability and sustainability of community-based wildlife enterprises to ensure sustainable development and the protection of the environment and biodiversity
	15	**15.5** Reduce degradation of habitats, halt biodiversity loss and prevent extinctions	

Aichi Biodiversity Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity

Zimbabwe's Target 11: By 2020, develop and implement strategies to conserve and maintain cultivated, farmed and domesticated genetic resources and their wild relatives, including other socioeconomically and culturally valuable species

Zimbabwe's contribution to the achievement of ABT 13	SDG supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is high. Through various initiatives Zimbabwe has been promoting the safeguarding of genetic diversity of cultivated plants and farmed and domestic animals and of wild relatives (see Target 11, sections 2116 and 2117)	2	**2.1** End hunger, especially for vulnerable	Support for implementation of SDG 2 is high See Target 11 and section 47
		2.2 End malnutrition	
		2.4 Ensure sustainable food production; maintain key ecosystems	
		2.5 Maintain genetic diversity for agriculture and promote traditional knowledge	

Aichi Biodiversity Target 14: By 2020, ecosystems that provide essential services, including services related to water and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women and indigenous and local communities and the poor and vulnerable

Zimbabwe's Target 12: By 2020, implement policies and strategies to maintain and restore ecosystem integrity and reduce ecosystems degradation to enhance the livelihoods and well-being of all Zimbabweans, especially those of women and indigenous and local communities, and the poor and vulnerable.

Zimbabwe's contribution to the achievement of ABT 14	SDG supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is high See Targets 2, 8 & 12	1	**1.1** Eradicate extreme poverty	• Support for implementation of SDGs 1, 3, 5 & 13 is high • A number of initiatives are currently been undertaken • See Targets 8 & 12
		1.3 Social protection for vulnerable individuals	
		1.5 Build resilience of poor to climate, shocks	
	3	**3.9** Reduce deaths from pollution	
	5	**5.1** End gender discrimination	See Targets 2, 8 and 12
		5.5 Ensure women's participation	
	13	**13.1** Strengthen resilience and adaptation to disasters	
		13.2 Incorporate climate change into national policies	
		13.3 Awareness and capacity on climate mitigation and adaptation	

Aichi Biodiversity Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification

Zimbabwe's Target 13: By 2020, combat desertification, and enhance ecosystem resilience through conservation and restoration of degraded ecosystems

Zimbabwe's contribution to the achievement of ABT 15	SDG	Narration	Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is high See Target 13	13	**13.1** Strengthen resilience and adaptation to disasters	Support for implementation of SDGs 13 and 15 See Target 13
		13.2 Incorporate climate change into national policies	See Targets 1 and 2
		13.3 Awareness and capacity on climate mitigation, adaptation	
	15	**15.1** Ensure conservation, restoration, sustainable use of ecosystems and services	See Target 13
		15.2 Sustainably manage and restore forests	
		15.3 Combat desertification, restore degraded land	
		15.4 Conserve mountain ecosystems	

Aichi Biodiversity Target 16: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation

Zimbabwe's Target 14: By 2015, accede and domesticate the Nagoya Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization

Zimbabwe's contribution to the achievement of ABT 16	**SDG supported**		**Extent of support towards the implementation of the SDGs**
Zimbabwe's contribution is high See Target 14	**15**	**15.6** Promote fair and equitable sharing of resources	Support for implementation of SDG 15 is high See Target 14

Aichi Biodiversity Target 17: By 2015, each party has developed, adopted as a policy instrument and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan

Zimbabwe's Target 15: NBSAP updated and adopted as a policy instrument and implementation has commenced

Zimbabwe's contribution to the achievement of ABT 17	SDG supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is high. It adopted NBSAP2 as an instrument to guide biodiversity conservation in the country in February 2016	5	**5.1** End gender discrimination	• Support for implementation of SDGs 5, 16, and 17 is high. One of the primary goals of the Transitional Stabilisation Programme reforms agenda (2018 – 2020) is the alignment of the country's statutes to the Constitution so as to enhance policy coherence. The Constitution espouses: ▪ Gender equality ▪ Recognition of the rights of women, the elderly, youths and children ▪ Equitable sharing of national resources, including land ▪ Fair regional representation • With respect to gender balance, it calls upon the state to promote full gender balance, in particular to promote the full participation of women in all spheres of Zimbabwean society on the basis of equality with men and take all measures, including legislative measures, needed to ensure that: ▪ Women and men are equally represented in all institutions and agencies of government at every level ▪ Women constitute at least half the membership of all commissions and other elective and appointed governmental bodies established by or under the Constitution or any Act of Parliament ▪ Practical measures are taken to ensure that women have access to resources, including land, on the basis of equality with men • The State is also enjoined to take positive measures to rectify gender discrimination and imbalances resulting from past practices and policies • With regard to fair representation, the Constitution the State is enjoined to: i) promote the fair representation of all Zimbabwe's regions in all institutions and agencies of government at every level ii) take practical measures to ensure that all local communities have equitable access to resources to promote their development The alignment of statutes with the Constitution is intended to be completed in 2019. Thus, gender equality, promotion of peaceful and inclusive societies for sustainable development, as well as policy coherence for sustainable development, will be enhanced, which will give impetus towards the implementation of NBSAP2 and the SDGs
		5.5 Ensure women's participation	
	16	**16.6** Develop accountable, transparent institutions	
		16.7 Ensure inclusive, participatory decision making	
		16.6 Develop accountable, transparent institutions	
	17	**17.14** Policy coherence for sustainable development	

Aichi Biodiversity Target 18: By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant to the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities at all relevant levels

Zimbabwe's Target 16: By 2020, the traditional knowledge, innovations and practices of local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected and integrated and reflected in the implementation of NBSAP with the full and effective participation of local communities at all relevant levels

Zimbabwe's contribution to the achievement of ABT 18	SDG supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is high See Section 2161	2	**2.5** Maintain genetic diversity for agriculture and promote traditional knowledge	Support for implementation of SDGs 2, 5, 10 and 16 is high See sections 2161 to 2162, as well as 417
	5	**5.5** Ensure women's participation	
	10	**10.2** Promote inclusion of all	
	16	**16.10** Public access to information	

Aichi Biodiversity Target 19: By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied

Zimbabwe's Target 17: By 2020, science, technology and innovation relating to biodiversity, its values, functioning, status and trends and the consequences of its loss, are strengthened, improved, widely shared, transferred, and applied

Zimbabwe's contribution to the achievement of ABT 19	SDG supported		Extent of support towards the implementation of the SDGs
See Section 41	**4**	**47** Education for sustainable development	• Support for implementation of SDGs 4, 9, 12 and 17 is high • See Target 1 and Section 41 • The TSP is prioritising the rehabilitation of public infrastructure projects in agriculture, energy and power development, water and sanitation, ICT, housing and transport, with a focus on expediting completion of infrastructure projects to enhance resource use efficiency • For the 2019 fiscal budget, it aims to increase the share of capital expenditures to total government outlays from the current 16% to beyond 25% • The government aims to intensify efforts to bring Internet connectivity to every household countrywide and facilitate development of community information centres across the country, thus improving access to information
Zinbabwe's contribution is high. Under the Transitional Stabilisation Programme, the government has committed itself to implement programmes to upgrade of infrastructure and enhance collaboration and cooperation with the international community	**9**	**94** Retrofit industries for efficiencies, technology	
		95 Increase research and development	
	12	**122** Sustainable management of natural resources	
		128 Awareness of sustainable development	
	17	**176** Enhance North-South and South-South cooperation	
		179 Enhance targeted capacity building to support national plans	

Aichi Biodiversity Target 20: By 2020 at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011–2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels This target will be subject to changes contingent on resources needs assessments to be developed and reported by the parties

Zimbabwe's Target 18: By 2020, mechanisms for resource mobilization and accounting are established and financial resources from national budgets and other sources for the implementation of the NBSAP2 increased from current levels

Zimbabwe's contribution to the achievement of ABT 20	SDG supported		Extent of support towards the implementation of the SDGs
Zimbabwe's contribution is moderate. Although Zimbabwe has over the last decade experienced severe economic challenges, the government has been able allocate funds towards environmental protection and biodiversity conservation, as well as support and facilitate development and environmental programmes by supranational environmental agencies such as the FAO, GEF, UNEP and UNCCD	17	**17.1** Domestic resource mobilization **17.6** Enhance North-South and South-South cooperation **17.17** Effective partnerships	• Support for implementation of SDG 17 • Zimbabwe through the Transitional Stabilisation Programme is taking measures to normalize relations with Western countries, which will enhance collaboration and cooperation with the international community, and facilitate the stabilization and growth of the economy The country has set a target of being an upper-middle-income economy by 2030. Improved economic performance will aid the implementation of the SDGs

APPENDIX I: Global Aichi Biodiversity Targets

Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society	
Target	Narration
1	By 2020 at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
2	By 2020 at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.
3	By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.
4	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.
Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use	
5	By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.
6	By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.
7	By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.
8	By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.
9	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.
10	By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Continued from previous page

Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity	
Target	Narration
11	By 2020, at least 17% of terrestrial and inland water, and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.
12	By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
13	By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.
Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services	
14	By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.
15	By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15% of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.
16	By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.
Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building	
17	By 2015, each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.
18	By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.
19	By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.
20	By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

APPENDIX II: Implementation of NBSAP 6 targets

Table 1 Target 1: The strategy, actions and indicators for Target 1, and summary comments on progress on implementation

Strategy	Action	Indicator	Comment on progress
Develop and implement a comprehensive communication, education and public awareness strategy for the conservation and sustainable use of biodiversity	Identify key target groups and select sectoral champions to drive awareness of biodiversity among specific sectors, such as mining, agriculture, energy, plantation forestry, health, youth, gender and local government	• At least 15 champions from government agencies, NGOs, private sector, educational and research institutions take a lead in running biodiversity programmes • At least five collaborative initiatives are in place between mainstream biodiversity sectors and other sectors	• More than 15 biodiversity champions have been identified. They include a Green ambassador, pangolin ambassador and Big Five ambassador • The sectors that have supported biodiversity initiatives are: telecommunications[1,2,3], banking[4,5] and manufacturing[6]. The Business Council for Sustainable Development Zimbabwe[7], which comprises 80 organizations, has been involved in raising awareness on biodiversity, the environment and sustainable development
	Expand coverage of biodiversity issues in schools' curricula and tertiary institutions	At least one subject or course incorporating biodiversity is included in schools' curricula and tertiary institutions	A new primary school curriculum in which biodiversity, conservation and sustainable development are widely covered was developed and introduced. All tertiary institutions offer programmes on biodiversity

[1] Econet Wireless Zimbabwe: www.econet.co.zw/about-us/environmental-responsibility and www.ecofarmer.co.zw/

[2] Telone Zimbabwe: www.telone.co.zw/node/316

[3] ZOL: www.zol.co.zw/other-services/e-waste

[4] ZB Holdings: www.zb.co.zw/csr

[5] Standard Chartered Zimbabwe: www.sc.com/zw/sustainability/

[6] Delta Corporation Limited: www.delta.co.zw/better-world/

[7] Business Council for Sustainable Development: www.bcsdz.co.zw/

Table 1 Target 1 (continued)

Strategy	Action	Indicator	Comment on progress
	Prioritize, promote and facilitate academic and professional research and publications on biodiversity issues in the country Produce and widely disseminate simplified versions of academic publications	At least 20 peer-reviewed publications on biodiversity produced per year and available within the clearing house mechanism	• More than 100 peer-reviewed publications on biodiversity are produced annually. Zimbabwe is among the top 100 globally and 12th on the African continent with respect to publications in the environmental science field[8] • The clearing house mechanism is still to be operationalized
	Publish and widely disseminate summarized versions of the NBSAP2	• At least 1,000 copies of summarized versions of NBSAP2 produced and disseminated • At least one NBSAP2 public awareness campaign held per province	• Summary versions of NBSAP2 are still to be produced • Provincial awareness campaigns on the NBSAP2 were held in each province
	Conduct a survey of targeted stakeholders to assess levels of understanding (knowledge, attitude and practice) of biodiversity	All targeted stakeholders have a KAP score of at least 50%	A number of studies have been done on aspects of knowledge, perceptions, attitudes and practices. The studies were localized and have not gone further to determine the KAP score. There is a need for broader and more representative studies

[8] *SCImago Journal and Country Rank*: www.scimagojr.com/

Table 1 Target 2

Strategy	Action	Indicator	Comment on progress
Develop a biodiversity policy to be mainstreamed into all sectors and incorporated into the national accounting and reporting system	Coordinate processes to develop the biodiversity policy	Biodiversity policy document	The process of developing the biodiversity policy has yet to commence
	Biodiversity issues reflected in national economic blueprints	All seven sectors (mining, agriculture, health, manufacturing, transport, energy, tourism) have mainstreamed biodiversity	ZimAsset, which expired on 31 December 2018, and the Transitional Stabilisation Programme (TSP) reforms agenda (October 2018-December 2020) both have biodiversity mainstreamed as key for sustainable development. Generally, all sectors have mainstreamed biodiversity. No major development or initiative may be undertaken without an environmental impact assessment
	Sensitize parliamentary portfolio committees of these sectors, traditional leaders, local authorities and the private sector about the importance of developing a biodiversity policy	At least one awareness and training session per year	Discussions with a broad range of stakeholders have been held on the need for a biodiversity policy. The broad consensus has been that the current legal framework on the environment and biodiversity is adequate, although reviews of certain aspects are required, which may be covered under statutory instruments
	NBSAP endorsed by government at the highest level	NBSAP endorsement	NBSAP2 was endorsed
Use biodiversity and ecosystems services valuation tools to quantify economic, social, cultural and ecological values	Conduct economic valuation studies for priority biodiversity areas	Ecosystem valuation of at least two ecosystems (one terrestrial, one aquatic)	Some studies have been done, including ecosystem evaluations of Songore wetland,[1] Drienfontein, Monavale and Borrowdale wetlands by EMA, and of Lake Chivero Recreational Park by ZPWMA
	Use spatially based data and other biodiversity information to lobby for an increase in financial resource allocation of biodiversity in national budget	Amount of money allocated to key biodiversity sectors in national budget annually increased by 10% from the 2012 baseline	Government support for the biodiversity sector has been high, with a number of medium- and large-scale programmes receiving government support. Between 2014 and 2018, the annual amount allocated to the METHI in the national budget was more than 10% of the 2012 baseline (see Target 18)
	Facilitate capacity building on biodiversity mainstreaming for the National Planning Agency	At least one training session per year for NPA staff in biodiversity	No training has been done

[1] Mahlatini P., Hove A., Maguma L. and Chemura A. 2018. 'Using direct use values for economic valuation of wetland ecosystem services: A case of Songore wetland, Zimbabwe'. *GeoJournal*: https://doi.org/10.1007/s10708-018-9947-3

Table 1 Target 2 (continued)

Strategy	Action	Indicator	Comment on progress
	Promote incorporation of environmental reporting/accounting systems by industry	At least 64 companies (those listed on the Zimbabwe Stock Exchange) incorporate environmental reporting and accounting systems	An assessment of 22 companies showed that 10 (45.5%) companies incorporated environmental reporting in their 2017 reports
	Facilitate the meetings of the Environmental Council and mainstream biodiversity issues within the agenda	Inter-ministerial committee meets at least biannually has biodiversity issues on their agenda	Initial meetings have been held
	Facilitate capacity building on biodiversity mainstreaming for the National Planning Agency	At least one training session per year for NPA staff in biodiversity	No training has been done

Table 1 Target 3

Strategy	Action	Indicator	Comment on progress
Strengthen institutional capacity for implementation of biodiversity and ecosystems conservation	Systematically implement a national fire protection strategy, including use of spatially based data	15% reduction in area burnt per year	There has been a decrease of about 10% in area burnt per year from 2014 to 2017
	Strengthen the capacity and coordination of law enforcement agencies at national level	At least two meetings on biodiversity per year for law enforcement agencies	More than two meetings have been held and anti-poaching patrols conducted by ZPWMA and other law enforcement agencies annually[1]
	Strengthen capacity of local authorities to promote sound environmental management	At least 50% of local authorities incorporate NBSAP in their plans	A limited number of local authorities have incorporated the NBSAP into the planning of local environmental action plans (LEAPs)
Sustainable land management	Promote and support community-based natural resources management (water, forest, fisheries, wildlife, rangelands and soil conservation)	Community-based natural resources management protects at least 60,000km^2 of buffer zones around national parks and forest reserves	A number of initiatives are ongoing, including programmes under CAMPFIRE, which cover 50,000km^2
	Promote and support community-based forestry enterprises	At least two forestry enterprises are set up and functioning per district	At least two forest initiatives are ongoing in most districts. They include agroforestry, indigenous silviculture and tree breeding programmes supported by the Forestry Commission[2]
	Monitor and evaluate success of afforestation programme	At least one woodlot per district per year is evaluated	Monitoring and evaluation of afforestation programmes are being done annually per district
	Promote use of alternative energy in small-scale agriculture and promote energy-efficient and energy-saving techniques for processing agricultural produce, such as fuel-efficient barns	At least two alternative energy technologies used by 60% of smallholder farmers and small-scale brick moulders	Fewer than 50% of smallholder farmers use alternative energy technologies, although the Rural Electrification Agency (REA) provides a 40% subsidy to rural communities. REA has also promoted biogas, solar and micro/mini hydro projects[3]

[1] ZPWMA: http://zimparks.org/poaching-activities-decline/, accessed 22 November 2018
[2] Forestry Commission: www.forestry.co.zw
[3] REA: 'The Rural Electrification Fund': www.rea.co.zw, accessed 20 November 2018

Table 1 Target 3 (continued)

Strategy	Action	Indicator	Comment on progress
Promote and lobby for development of renewable energy and energy-saving alternatives	Formulate renewable energy policy	Renewable energy policy in place	Draft policy on renewable energy policy has been developed; the national energy policy promotes adoption of renewable energy
	Establish a financing mechanism for renewable energy projects	• A renewable energy investment prospectus is in place	• The draft investment prospectus has been developed and offers investment incentives which include negotiable tax holidays and exemption from payment of withholding tax
	Scale up renewable energy and energy conservation technologies, including sustainable fuelwood use	• At least five medium-scale renewable energy projects are implemented (solar, hydro, biogas and natural) • Renewable energy contributes at least 10% to the national energy grid	• 15 mini- and micro-hydropower stations have been commissioned since 2010 • Two medium- to large-scale hydropower projects are at different levels of development[1] • Biogas[2,3] and solar energy projects have been implemented across the country, and more than 200 biogas plants have been installed • Renewable energy, through hydropower contributes about 45% to the national energy grid[4]
	Promote use of alternative energy in small-scale agriculture and promote energy-efficient and energy-saving techniques for processing agricultural produce, such as fuel-efficient barns	At least two alternative energy technologies used by 60% of smallholder farmers and small-scale brick moulders	Fewer than 50% of smallholder farmers use alternative energy technologies, although the Rural Electrification Agency (REA) provides a 40% subsidy to rural communities. REA has also promoted biogas, solar and micro/mini hydro projects[5]

[1] Zimbabwe Power Company: www.zpc.co.zw/projects/, accessed 25 November 2018
[2] SNV-Netherlands Development Organization. 'National domestic biogas programme, Zimbabwe': www.snv.org/, accessed 23 December 2018
[3] WWF Zimbabwe
[4] AECF: www.aecfafrica.org/indexphp/media_centre/blogs/renewable_energy_in_zimbabwe, accessed 20 November 2018
[5] REA: 'The Rural Electrification Fund': www.rea.co.zw, accessed 20 November 2018

Table 1 Target 4

Strategy	Action	Indicator	Comment on progress
Integrated ecosystem-based management plan	Monitor and effectively manage fish stocks of key commercial species	• Fishing of kapenta in Kariba reduced by 20% per year; • Annual report on fish stocks and water quality	• Stopping fishing on Lake Kariba during the full moon has reduced fishing effort by 23% on the Zimbabwe side • Annual reports on fish stocks in Lake Kariba have been produced
	Promote the implementation of the code of conduct for responsible fisheries	At least 70% of the principles, goals and elements of the code of conduct are incorporated into national fisheries policy and legislation	Development of fisheries policy is underway
	Develop appropriate monitoring mechanism for water quality and determinant factors in key water bodies	Monitoring mechanism for water quality in place	Monitoring mechanism for water quality in place. Water quality monitoring across the country done by EMA, with ZINWA also monitoring water quality in dams
	Adopt and implement international guidelines for securing sustainable small-scale fisheries	International guidelines locally adopted and implemented	The guidelines are being discussed as part of the fisheries policy that is being developed
	Review and develop framework to strengthen community-based management of fisheries, including monitoring and reporting	• 20% of fisheries co-management structures resuscitated • International guidelines locally adopted and implemented	• Fisheries co-management structures have not been resuscitated • Processes being reviewed alongside the development of the Fisheries Policy
	Enhance trans-boundary management of aquatic resources through engagement	• At least three technical consultative meetings held annually • Technical committee meetings	• No technical consultative meeting has been held since 2016 • No technical committee meeting has been held since 2012
	Monitor aquaculture and promote use of indigenous species	Database of all aquaculture businesses	Database on aquaculture is being developed by ZPWMA
Fisheries and aquaculture policy	Develop fisheries and aquaculture policy	• Fisheries and aquaculture policy in place • Aquaculture operations regulated	• Fisheries policy is under discussion • Aquaculture is regulated by ZPWMA in state dams

Table 1 Target 5

Strategy	Action	Indicator	Comment on progress
Biodiversity management	Promote and support adoption of conservation agriculture, agro-forestry and organic farming	At least 60% of smallholder farmers are practising conservation agriculture, agro-forestry and organic farming	• About 300,000 farmers have adopted conservation agriculture but its adoption is frequently incomplete, with about 74% using all practices in one year • The area under organic farming increased by about 162% between 2013 and 2015
	Establish soil conservation works on farms	50% of conservation works achieved in all farming areas	The use of conservation works in quite widespread in Zimbabwe
	Identify and define key biodiversity areas under threat	Report on nationwide inventory of key biodiversity areas	Nationwide inventory report on key biodiversity areas has not been produced
	Identify important fragile habitats and institute mechanisms to conserve them	Report and map of fragile habitats	Status reports on some fragile habitats such as key biodiversity areas have been produced
	Conduct ecological monitoring	Status reports on key species and biodiversity areas produced annually	Status reports on some key species and biodiversity areas have been produced
	Promote and support holistic rangeland management	In four districts in south-western Zimbabwe, communities are practising holistic rangeland management species diversity	Promotion of holistic rangeland management are being done through a number of programmes, including the Zimbabwe Resilience Building Fund. The Africa Centre for Holistic Management on the 3,200 ha Dimbangombe Ranch near Victoria Falls has been providing training and learning programmes on holistic land and livestock management [1]

[1] The Africa Centre for Holistic Management: www.africacentreforholisticmanagement.org

Table 1 Target 5 (continued)

Strategy	Action	Indicator	Comment on progress
	Integrate biodiversity management with agricultural development programmes, including Comprehensive Africa Agricultural Development Programme	At least one national-level agricultural programme incorporates agro-biodiversity conservation (heat- and drought-tolerance maize and low nitrogen on maize) by Crop Breeding Institute (CBI)	There is ongoing work on maize and other crops CBI has been carrying out research on crop varieties for maize, wheat, groundnuts, soybeans, sunflower, cowpea, rice, common bean, sorghum, finger millet, pearl millet, potato and Bambara nut[2]
	Use spatial data analysis to establish the land under agriculture, aquaculture and forestry as a baseline and monitor area sustainable development	Up-to-date land use maps and data	Spatial data analysis now being used to assess land use and land cover change
	Use value addition and beneficiation opportunities to promote sustainable management of forests	At least two agro- and natural biodiversity processing centres established per province	A number of initiatives are being promoted, including the Integrated Food, Nutrition and Income Security Programme[3] and Sustainable Forest Management Project[4]

[2] Department of Research and Specialists Services Crop Breeding Institute: www.drss.gov.zw
[3] SNV: www.snv.org/project/integrated-food-nutrition-and-income-security-programme-fni
[4] WWF Zimbabwe: http://zimbabwepandaorg/what_we_do/sustainable_forest_management_project_/

Table 1 Target 6

Strategy	Action	Indicators	Comment on progress
Prevent pollution of ecosystems	Monitor and enforce national quality standards for water, air and solid waste	Improved environmental quality in heavily impacted areas; air quality improved by 10%; water quality improved by 15%; solid waste quality improved by 10%; and hazardous waste quantities reduced by 15%	• Air quality in both urban and rural areas has been lower than the WHO standards. Zimbabwe's Environmental Performance Index (EPI) score decreased from 7,800 in 2014 to 5,352 in 2018, a decrease in air quality of 3138% • The quality of water across the country's water bodies has been relatively high • Solid waste management is generally at a low level across the country • Hazardous waste monitoring by EMA has increased
	Review fines for environmental infringements and mechanisms for enforcement	At least five of the seven statutory instruments on environmental regulations are reviewed	Five statutory instruments have been reviewed
	Upgrade waste dump sites in line with SI 6 of 2007	At least 40% of dump sites are upgraded in urban centres	Ongoing, and 30% of dump sites have been improved
	Promote increased recycling of waste	At least 40% of waste is recycled	Recycling of waste is being promoted and a number of recycling companies have been registered
	Promote and support alternative uses for solid waste such as biogas	See Target 3	REA programmes on renewable energy include promotion of biogas[1] (see Target 3)
	Promote increased consumer consciousness and demand for environmentally sustainable production and services	KAP score at 50% of the target population	Assessment of knowledge, attitudes and practices for environmentally sustainable production and services among Zimbabweans is yet to be done
	Undertake measures to ensure environmental impact assessments are effective	Reviewed EMA document on EIA process in Zimbabwe	Review is ongoing
	Assess the extent of impact of chemical use on water bodies	Report on extent of chemical use on major water bodies supplying municipal water in major cities	Still to be done

[1] www.rea.co.zw/indexphp/achievements

Table 1 Target 7

Strategy	Action	Indicator	Comment on progress
Biodiversity management	Monitor invasive alien species in terms of species, abundance and trends in distribution: • Eastern Highlands – wattle, wild ginger, water lettuce • Mashonaland Central and Mashonaland East – fruit fly (*Bactrocera invadens*) • Mashonaland Central, Mashonaland West and Midlands – maize weevils and large grain borer • Zambezi Valley – water hyacinth, crayfish • Hwange – *Lantana camara*, *umkhawuzane Dichapetalum cymosum* and Indian mynah • Matabeleland South, Masvingo and Gonarezhou – *Opuntia*, *Lantana camara*, Indian mynah	An updated, comprehensive invasive alien species inventory	• Monitoring of some invasive species, mainly *L. camara* and *C. fulgida*, is ongoing • Updated, comprehensive invasive alien species inventory is available
	Update current schedule of invasive species	Updated list of invasive species in the Environmental Management Act	List of invasive species in the Environmental Management Act is still to be updated. EMA, Forestry Commission and National Herbarium are reviewing the list of invasive species, as well as carrying out assessments on the status of some non-native species
	Develop policy on invasive alien species	Policy document in place	Process still to commence
	Develop and implement management plans for controlling priority invasive alien species	• Management plans in place • At least five management plans implemented • Reduction in rate of spread or area affected by invasive alien species, particularly *Lantana camara* (reduced by at least 1,000 ha per year), *Opuntia* (reduced by at least 500 ha per year), water hyacinth, crayfish and Indian mynah	• Management plans available for *L. camara* and *O. fulgida* • *Opuntia* in Matabeleland South and Masvingo controlled and now occurs in isolated patches • *L camara* management and control ongoing

Table 1 Target 8

Strategy	Action	Indicator	Comment on progress
Disaster risk reduction	Incorporate biodiversity conservation action into the national disaster risk reduction strategy	A composite, comprehensive and functional key biodiversity areas disaster risk management plan	There is no disaster risk management plan, but there are action plans which incorporate biodiversity at district level
	Promote ecosystem-based adaptation and mitigation programmes, including REDD+, assisted dispersal, connectivity, market-based mechanisms, increasing protected areas, rehabilitation and restoration, and enhancing sustainable production	• At least three large-scale adaptation and mitigation programmes (including community-driven projects) implemented • The National Adaptation Plan incorporates biodiversity issues • Intended Nationally Determined Contributions incorporate biodiversity issues	• A number of projects have been initiated: - Scaling up adaptation in Zimbabwe through strengthening integrated planning systems project[1] - Supporting enhanced climate action for low-carbon and climate-resilient development pathway project (SECA)[2] - Hwange-Sanyati biological corridor - Strengthening biodiversity and ecosystems management and climate-smart landscapes in the mid to lower Zambezi region - Zimbabwe Resilience Building Fund - Kariba REDD+ project • Climate Change Policy and the National Climate Change Response Strategy incorporate biodiversity (see Target 2) • NDC has been put in place and incorporates biodiversity
	Investigate and monitor effects of climate change on priority biodiversity and ecosystems services; conduct vulnerability assessments	• At least three selected key biodiversity areas and key species have climate change vulnerability assessments • At least five climate change key indicator species are identified and monitored	• No vulnerability assessment has been done • No climate change indicator species have been identified
	Incorporate value of ecosystems to climate change adaptation in environmental planning	At least 50% of environmental plans include value of ecosystems to climate change adaptation	A limited number of plans have started including value of ecosystems to climate change adaptation
	Promote production of drought- and heat-tolerant, high-yielding local varieties	At least two high-yielding local plant varieties promoted	• Work done by DRSS, CTDO, AGRITEX and CIMMYT • Drought-tolerant maize for Africa (DTMA) project led by CIMMYT
	Promote the production of drought-tolerant livestock	At least two indigenous drought-tolerant animal breeds promoted	Henderson and Makoholi research stations breed the Mashona cattle and Matopos Research Station the Nguni cattle
	Support measures to reduce poaching in protected areas	Poaching of major wildlife species reduced by 50%	Anti-poaching measures have been enhanced across the country. For example, the African Wildlife Foundation has been working with ZPWMA, and other stakeholders to strengthen the capacity and management of rangers[3]

[1] Climate Change Management Department: www.climatechange.org.zw/

[2] www.climatechange.org.zw/sites/default/files/SECA.pdf

[3] www.awf.org/country/zimbabwe

Table 1 Target 9

Strategy	Action	Indicator	Comment on progress
Adaptive ecosystems management approach, such as transfrontier conservation areas, with private and public participation	Take stock of the protected area network to verify the 28% total land area extent baseline and establish new baseline if necessary	Exact percentage of terrestrial and aquatic ecosystem under protection verified	About 27.2% is under protection
	Conduct annual assessments of the effectiveness of management of protected areas in priority biodiversity areas	Annual assessment reports produced for each protected area	Periodic assessments have been done but not annually
	Develop mechanisms for recognition of the contribution of successful community-conserved areas to the national protected area system	At least three community conservation areas conserved per district	• Mucheni community conservancy in Binga formed between 2014 and 20161, and funded by FAO • Sidinda in Hwange established and funded under the Hwange-Sanyati biological corridor • Jamanda, Naivasha and Ume River community conservancies funded under the Wildlife in Livelihood Development Programme • Other community conservancies are the Shangani, Senuko, Nyanfambe and Plumtree conservancies
	Promote initiatives that support appropriate land use options consistent with protected area policy and practices, especially where settlements are a threat	• Regularize all settlements in protected areas • Work to ensure no new settlements in protected areas	All settlements in protected areas have been identified and extent of encroachment digitized through remote sensing. A ground truthing exercise will be done to confirm encroachment and to count individuals and families
Coordination and integration of the implementation of conventions, notably CBD, UNCCD, Ramsar, World Heritage Sites, UNESCO biosphere reserves, Convention on Migratory Wild Species, SADC Protocol on Fisheries, SADC Protocol on Wildlife Conservation and Law Enforcement, transboundary treaties, protected sites and the UNFCCC	Establish a platform for all environmental conventions' focal points for coordination and establish a conventions office under the METHI	Functional environment conventions office established at the METHI	Not yet established, but there are focal points for specific conventions

[1] https://www.africahunting.com/threads/mucheni-conservancy.43686/

Table 1 Target 10

Strategy	Action	Indicator	Comment on progress
Conservation and protection of threatened species	Undertake species diversity, population status and trends studies and maintain species inventories	• Species checklists • Species population status and trends reports	Inventories of species status available on the IUCN Red List of Threatened Species website: www.iucnredlist.org/
	Assess and review the threat status of species	IUCN Red List and books for threatened species produced for Zimbabwe	No stand-alone book on threatened species produced for Zimbabwe; information available on the IUCN Red List
	Develop and implement management plans for selected priority species	Species action plans developed for at least five species	More than five management plans have been developed and implemented for elephant, rhino, lion, leopard, painted dog, crocodile, vulture, grey-crowned crane and wattled crane
	Promote and strengthen transboundary mechanisms for conservation of threatened species, including shared ecosystems	Regional framework for collaboration and implementation in place	• Established transfrontier conservation area treaties signed: - Kavango Zambezi TFCA – Angola, Botswana, Namibia, Zambia and Zimbabwe - Great Limpopo TP and TFCA – Mozambique, South Africa and Zimbabwe • Emerging TFCAs MOUs signed: - Chimanimani – Mozambique and Zimbabwe - Greater Mapungubwe TFCA – Botswana, South Africa and Zimbabwe • Conceptual TFCAs: - Lower Zambezi-Mana Pools TFCA – Zambia and Zimbabwe - ZIMOZA TFCA – Mozambique, Zambia and Zimbabwe
	Operationalize clearing house mechanism	Clearing house mechanism in place and regularly updated	Clearing house mechanism still to be operationalized

Table 1 Target 11

Strategy	Action	Indicator	Comment on progress
Ex situ and *in situ* conservation (ecosystem conservation approach)	Develop checklist of cultivated plant and farmed animals	A database of cultivated plants and farmed animals and their wild relatives	A database and checklist of cultivated plants and farmed animals have been developed
	Establish and maintain fully equipped plant and animal gene banks	At least one fully equipped and functional national plant and animal gene bank	The plant gene bank is operational and a number of community seed banks have been established
Private, public and community participation	Raise public awareness on biosafety issues	All targeted stakeholders have a KAP score of at least 50%	A nationwide survey to assess the knowledge on biosafety is still to be done
Safeguarding genetic diversity	Promote market-driven seed supply, cultivation and consumption of local crop varieties (herbs and vegetation)	At least 50% of smallholder farmers are cultivating or consuming at least two local crop varieties	More than 50% of smallholder farmers are cultivating and consuming at least two local crop varieties
	Promote market-driven rearing and consumption of local livestock varieties	At least 50% of smallholder farmers are rearing or consuming at least two indigenous livestock varieties	More than 50% of smallholder farmers in Zimbabwe rear and consume indigenous livestock varieties

Table 1 Target 12

Strategy	Action	Indicator	Comment on progress
Gender mainstreaming	Incorporate gender consideration in all laws, policies, strategies, by-laws and mechanisms that govern management, access and control of biodiversity resources	All provisions related to environment management and biodiversity conservation are gender-sensitive	One of the guiding principles of Zimbabwe's policy framework is the mainstreaming of gender, youth and other vulnerable groups, and the national development frameworks (ZimAsset and Transitional Stabilisation Programme) have gender, youth and vulnerable groups as key for the country's development
	Build the capacity of state and non-state development agencies in gender mainstreaming in biodiversity conservation and sustainable utilization initiatives	Gender balance achieved in the number of people participating in and benefiting from biodiversity conservation initiatives	Zimbabwe has made great strides towards achieving gender balances in biodiversity programmes
Diversify income-earning opportunities	Promote and support innovative income-generating initiatives utilizing biodiversity and ecosystems sustainably and support public–private community partnerships (PPCPs) for viable biodiversity-based businesses	At least five types of viable and sustainable agro- and natural biodiversity enterprises per province, including PPCPs	The Zimbabwe Resilience Building Fund has projects in eight provinces that promote innovative income-generating initiatives, including promotion of community-private partnerships
		National agro- and natural biodiversity product commercialization guidelines updated	Updating of guidelines yet to commence

Table 1 Target 13

Strategy	Action	Indicator	Comment on progress
Enhance ecosystem resilience	Reclaim and rehabilitate degraded areas, wetlands, watersheds and rivers, using innovative approaches	At least 30% of degraded areas reclaimed – miombo woodland, aquatic ecosystems and grasslands – in the critical areas of Matabeleland South, Eastern Highlands, Manyame catchment and Masvingo	Less than 30% of degraded areas have been reclaimed. Significant declines have been experienced in wetlands and grasslands.[1] Water pollution in the Manyame catchment is high[2]
		• Annual deforestation rate reduced by 10% • At least 10% of deforested areas are reforested by 2020 • At least 30% of wetlands restored	• Deforestation has not been reduced. The rate of deforestation remains high at about 330,000 ha annually • A number of afforestration and reforestation programmes have been carried out across the country. For example, the Sustainable Afforestation Association planted nearly 11,000 ha of eucalyptus trees in tobacco-growing areas from 2014 to 2017 in a commercial forest plantation programme. During the same period, 117 ha were planted under a community woodlot trial run • Less than 30% of wetlands have been restored. There are 1,117 wetlands spread across the country covering about 793,000 ha • About 21% of the wetlands are in stable and pristine condition, 20% badly degraded, and the remainder on the brink of being irrecoverable
	Implement interventions for priority water bodies and major watercourses	Integrated catchment management plans developed and implemented for all seven major water courses	ZINWA has developed catchment plans for the seven major water courses. The degree of integrated water resources management implementation in Zimbabwe stands at 61% and the level of water stress (freshwater withdrawal as a proportion of available freshwater resources) was 24.3% in 2014[3]
	Incorporate UNCCD actions into biodiversity conservation initiatives	Joint biodiversity planning and reporting for the UNCCD and CBD adopted.	Joint planning and implementation for the UNCCD and CBD have not been adopted

[1] Tagwireyi P., Ndaimani H. and Dube T. 2018. 'UNCCD performance review and assessment of implementation system: Seventh reporting process for Zimbabwe'

[2] Muchini R., Gumindoga W., Togarepi S., Masarira T.P. and Dube T. 2018. 'Near real-time water quality monitoring of Chivero and Manyame lakes of Zimbabwe'. *Proceedings of the International Association of Hydrological Sciences* 378: 85-92

[3] https://environmentlive.unep.org/country/data/ZW

Table 1 Target 14

Strategy	Action	Indicator	Comment on progress
Accession to and domestication of the Nagoya Protocol	Capacity building on ABS negotiations at all levels and entry points (contracts, traditional knowledge)	At least one meeting and workshop on issues of access and benefits sharing held in each area	At least one workshop or meeting has been held in each province. The workshops are ongoing
	Finalize appropriate instruments for accession and domestication	Instruments deposited	Instrument has been deposited and Zimbabwe has been a party to the protocol by accession since 30 November 2017
	Promote awareness of provisions of ABS instruments	At least one community- and district-level meeting held in each province	A number of awareness initiatives have been held throughout the county and are continuing

Table 1 Target 15

Strategy	Action	Indicator	Comment on progress
NBSAP adoption as policy and planning instrument	• Facilitate the adoption of NBSAP2 as a policy instrument • Sensitize heads of ministry departments on the NBSAP	Adoption and launching of NBSAP2	• NBSAP2 has been adopted and was submitted to the CBD secretariat on 16 February 2016 • Sensitization of stakeholders has been limited
	Lobby and facilitate for integration of NBSAP2 implementation costs into the national budget	At least 30% of the costs of implementing of the NBSAP2 are met by Treasury funding	There has been no prioritization of funding of the implementation of the NBSAP2
	Implement the monitoring and evaluation framework for NBSAP2, including mid-term review	Annual NBSAP2 progress reports produced	No NBSAP2 progress report because no review was done
	• Establish implementation and coordination structures for NBSAP2 • Develop a implementation and resource mobilization plan	• National Biodiversity Forum and its sub- and technical committees are active and fully funded • Implementation and mobilization plan in place	• Although the National Biodiversity Forum has been operational, it has done so with very limited budgetary support • Implementation and mobilization plan available
	Facilitate development of projects and programmes by stakeholders that address the objectives of NBSAP2	At least 90% of biodiversity-related projects are linked and address objectives of NBSAP2	Although a number of projects address the objectives of NBSAP2, there has been no assessment of the percentage of biodiversity-related projects that are linked and that address objectives of NBSAP2

Table 1 Target 16

Strategy	Action	Indicator	Comment on progress
Community empowerment and participation	Strengthen existing local and community-based environmental structures to incorporate biodiversity issues	Functional and appropriate local and community environmental structures in place in each district	Structures are in place and used in developing Local Environment Action Plans (LEAPs)
	• Local communities empowered to develop and implement LEAPs, including the participation of traditional leaders and CBOs • Promote the establishment of new or strengthening of existing indigenous knowledge-based community conservation areas	• At least 30% of the wards in each district have environment action plans that are developed and implemented by local communities • At least one indigenous knowledge-based community conservation area per district established or strengthened	• Some local authorities in Zimbabwe have developed LEAPs • Inadequate documentation of indigenous and community-conserved areas[1] • Organisations and government departments working on community empowerment include EMA, Forestry Commission, Parks, and NGOs
Mainstreaming Indigenous knowledge systems (IKS) into biodiversity conservation	• Document values, taboos, customary and traditional knowledge relevant to the conservation and sustainable use of biodiversity • Raise awareness of indigenous knowledge and access and benefit sharing • Integrate IKS into national biodiversity policies and programmes	• One national report on IKS produced • KAP score of at least 80% demonstrating the linkage of indigenous knowledge to ABS in biodiversity conservation • National biodiversity-related policies incorporate IKS • Number of IKS-related mechanisms and innovations incorporated in LEAPs	• National report still to be produced • A number of local level studies have been done • National intellectual property policy and implementation strategy (2018-2022) regulates some aspects of IKS • Activities at local authority level: Rural District Councils Act being amended to incorporate biodiversity issues • IKS is recognized and promoted for biodiversity conservation, but there is a need for alignment of policies with Constitution • LEAP development may need a review to fully incorporate IKS-related mechanisms and innovations

[1] Chibememe G.,Dhliwayo M., Gandiwa E., Mtisi S., Muboko N. and Kupika O.L. 2014. 'Review of national laws and policies that support or undermine indigenous peoples and local communities'. Ford Foundation, Zimbabwe

Table 1 Target 17

Strategy	Action	Indicator	Comment on progress
Science and technology innovations for reducing biodiversity loss	Invest in the development and application of innovative technologies for managing the major threats to biodiversity loss (fire, invasive species, pollution, poaching, agriculture, GMOs and mining)	Innovations that address at least three threats are developed or applied to reduce negative impacts on biodiversity	• Various studies have been carried out and some are ongoing, including rocket barn method for curing tobacco;[1] design of hybrid solar tobacco curing system for small-scale farmers;[2] a new water conservation metering technology[3] • The National Biotechnology Authority in collaboration with National University for Science and Technology and the South African National Biodiversity Institute through funding from the BioBridge Initiative carried out a project for an integrated regional technical capacity-building strategy on the use of DNA barcoding technology: 'Towards development of a SADC genetic invasive alien species database' • Training was done for Forestry Commission, EMA and ZPWMA among others and for some regulatory agencies in Zambia and Botswana
	Identify gaps in biodiversity expertise and incorporate it into training programmes and especially tertiary institutions curricula	• Database of biodiversity expertise, including indigenous knowledge systems • At least 50% of higher and tertiary institutions have revised and updated curricula to cover innovative technologies in biodiversity • At least one training and capacity-building programme on biodiversity innovations is held annually on each threat for key stakeholders	• Ongoing process: innovation hubs for Ministry of Higher and Tertiary Education, Science and Technology Development • Database on biodiversity expertise still to be developed • It has not been possible to have an annual training programme on each threat due to limited funding
	Build capacity in ecosystems valuation	At least three trainings are conducted on ecosystems valuation	None have been held. Short or low-level training courses held but not adequate to carry out ecosystem evaluation

[1] Green Energy Zimbabwe: http://greenenergyzim.misa.org/2017/08/18/innovative-ways-tobacco-curing/

[2] Madanhire I., Chiwarange T. and Mbohwa C. 2018. 'Design of hybrid solar tobacco curing system for small-scale farmers in Zimbabwe'. Proceedings of the international conference on industrial engineering and operations management, Bandung, Indonesia, 6-8 March 2018.

[3] Green Energy Zimbabwe: http://greenenergyzim.misa.org/2019/02/11/new-water-conservation-metering-technology/

Table 1 Target 18

Strategy	Action	Indicator	Comment on progress
Sustainable financing	Conduct a private-public income and expenditure review for biodiversity and recommend a framework for implementing payment for ecosystems services	• Analysis report • Framework for payment for ecosystem services	• No progress • Under local government, any development must compensate for environmental damage
	Lobby for access to environmental management funds to implement biodiversity programmes	• Environmental Fund under an independent multi-stakeholder institution • At least 70% of funds from Environmental Fund are used to finance biodiversity programmes	• No progress • Programmes are being funded through the fiscus
	Network with relevant organizations to tap into climate finance and other funds available through global initiatives	At least one large-scale biodiversity project is financed from international finance	Funding has been received for a number of programmes, notably the Hwange-Sanyati biological corridor; GEF is the main source of funding
Making a business case for biodiversity	• Determine the economic value of ecosystem services • Sensitize planners and stakeholders at all levels across all sectors about the value of biodiversity	• Increase of at least 10% in investment by other sectors towards biodiversity conservation • 50% increase in allocation from Treasury for biodiversity conservation • Reflection of biodiversity business in national accounts and the economic planning frameworks	• No review has been done • Low level of funding from Treasury • No progress

Table 2 Target 1: Types of activities for raising awareness on the values of biodiversity and its conservation by some of the major institutions in the biodiversity conservation sector of Zimbabwe

Organization	Website	Awareness-raising methods											
		1	2	3	4	5	6	7	8	9	10	11	12
Government agencies													
Environmental Management Agency	https://www.ema.co.zw/	√	√	√	√	√	√	√	√	√	√	√	√
Zimbabwe Parks and Wildlife management Authority	www.zimparks.org/	√	√	√	√	√	√	√	√	√		√	√
Forestry Commission	www.forestry.co.zw	√	√	√	√	√	√	√	√	√	√		
Department of Research & Specialist Services	www.drss.gov.zw/	√		√	√	√	√	√					
AGRITEX		√	√	√	√	√	√	√	√				
National Biotechnology Authority of Zimbabwe	www.nba.ac.zw/	√	√	√	√	√	√	√					
Non-governmental organizations													
Mukuvisi Woodlands	www.mukuvisiwoodland.co.zw	√	√	√	√	√	√	√	√	√		√	
BirdLife Zimbabwe	www.birdlifezimbabwe.org/	√	√	√	√	√	√	√	√	√		√	√
The Zambezi Society	https://zamsoc.org/	√	√	√	√	√	√	√	√	√		√	√
Community Technology Development Organization	www.ctdt.co.zw/	√	√	√	√	√	√	√	√				√
Wildlife and Environment Zimbabwe (WEZ)	www.wezmat.org/	√	√	√	√	√	√	√	√	√		√	
CAMPFIRE Association	http://campfirezimbabwe.org/	√	√	√	√	√	√	√	√	√		√	√
Lowveld Rhino Conservation		√			√	√	√	√		√		√	√

KEY: 1 = community and stakeholder meetings, 2 = commemorations, 3 = fairs and exhibitions, 4 = printed materials (brochures, pamphlets, posters and resource books), 5 = media interviews and news items on local radio and television, 6 = media interviews, feature articles and announcements in newspapers, magazines and electronic publications accessible via the internet, 7 = public forums, presentations and workshops, 8 = social events (such as sports tournaments and marches), 9 = audio-visual resources (pre-recorded cassettes, videos, CDs and DVDs, 10 = broadcast SMS messages to mobile telephones, 11 = education support (such as scholarships, school clubs and schools environment competitions), 12 = social media (Twitter, Facebook, WhatsApp etc.)

Table 2 Target 5: The main threats and threat levels of key biodiversity areas and important bird and biodiversity areas of Zimbabwe

Name	Area (ha)	Main Threats	Threat level
Nyanga mountains	29,000	Gathering of terrestrial plants	Medium
		Invasive non-native/alien species	High
		Increase in fire frequency/intensity	High
Nyanga lowlands and Honde Valley	11,000	Gathering of terrestrial plants	Not assessed
		Poaching	Not assessed
Stapleford Forest	23,000	Agricultural expansion and intensification	High
		Logging and wood harvesting	Medium
		Human intrusions and disturbance	High
		Pollution	Medium
Bvumba highlands	25,000	Invasive non-native/alien species	Not assessed
Banti Forest Reserve	1,800	Agricultural expansion and intensification	Not assessed
Chimanimani mountains	21,000	Logging and wood harvesting	Medium
		Mining and quarrying	Medium
		Invasive non-native/alien species	Medium
		Increase in fire frequency/intensity	High
Haroni-Rusitu junction and botanical reserves	500	Agricultural expansion and intensification	Not assessed
Chirinda Forest	950	Gathering of terrestrial plants	Medium
		Hunting and collecting terrestrial animals	Medium
		Invasive non-native/alien species	High
Hwange National Park	1,460,000	Natural system modifications	Medium
Chizarira National Park	191,000	Increase in fire frequency/intensity	High
Batoka Gorge	12,000	Human intrusions and disturbance	Medium
Middle Zambezi Valley	682,500	Invasive non-native/alien species	High
		Increase in fire frequency/intensity	High
		Transportation and service corridors	Medium
Robert McIlwaine Recreational Park	6,180	Agricultural expansion and intensification	High
		Fishing and harvesting aquatic resources	Very High
		Logging and wood harvesting	High
		Invasive non-native/alien species	High
		Increase in fire frequency/intensity	High
		Pollution	Very High
		Residential and commercial development	High
Sebakwe Poort	3	Logging and wood harvesting	Not assessed
		Pollution	Not assessed
Wabai Hill (Debshan Ranch)	100,000	Agricultural expansion and intensification	Not assessed
Matobo Hills	300,000	Gathering terrestrial plants	Medium
		Invasive non-native/alien species	Medium
		Increase in fire frequency/intensity	High

Table 2 Target 6: Zimbabwe's environmental performance profile for 2018

Issue categories	Environmental Performance Index		Rank out of 180
	2014	2018	2018
Environmental Health	46.42	40.58	150
Air quality	78.00	53.52	143
Water & sanitation	17.50	12.19	155
Heavy metals		42.65	111
Ecosystem vitality	51.62	45.30	138
Biodiversity & habitat	99.52	94.53	17
Forests	23.64	6.94	121
Climate & energy		24.89	170
Air pollution	100.00	8.21	175
Water resources	14.03	75.44	76
Agriculture	56.00	12.22	156
Fisheries	No data	No data	No data

Source: Wendling Z. A., Emerson J. W., Esty D. C., Levy M. A. and de Sherbinin A. 2018. '2018 Environmental Performance Index. Yale Centre for Environmental Law and Policy: https://epi.yale.edu/

Table 2 Target 7: Non-native plant species that were identified for monitoring in NBSAP2

Species	Comments
Acacia mearnsii (black wattle)	Threatens native habitats by competing with indigenous vegetation, replacing grass communities, reducing native biodiversity and increasing water loss from riparian zones.[1] Has extensively invaded Nyanga National Park, negatively affecting avifauna and other species. A clear policy and action for its removal from both within the national park and surrounding areas are urgently needed.[2]
Dichapetalum cymosum (*umkhawuzane*)	This is a small prostrate shrub that is native to Zimbabwe. It was identified for monitoring as it is extremely poisonous to cattle
Eichhornia crassipes (water hyacinth)	A native of South America, water hyacinth is now common in water bodies across Zimbabwe. It is particularly abundant in nutrient-rich systems especially Lakes Chivero and Manyame. Has been specified as an invasive species in Zimbabwe
Hedychium gardnerianum (kahili ginger)	This perennial herb, a native of the Eastern Himalayas, has been widely introduced as an ornamental shrub in different regions of the world.[3] It is locally abundant in parts of the Vumba forests.[4]
Lantana camara	Occurs throughout much of Zimbabwe (Fig. 2.10) where it is found as thickets that tend to choke other vegetation and become an aggressive invader of disturbed and overgrazed areas and is difficult to eradicate.[5] Its impact on biodiversity is largely negative.[6] Has become a threat to the Great Zimbabwe World Heritage Site.[7] EMA has an active control strategy for the plant
Opuntia fulgida (jumping cholla)	The jumping cholla was widespread and locally abundant in South-Western Zimbabwe and is present in some areas of Masvingo Province to the South-East of the country (Fig. 2.10). Its spines can injure livestock and it reduces the carrying capacity and the economic value of invaded areas.[8] EMA has an ongoing programme to eradicate the weed.[9] The plant has largely been cleared from most of the areas
Pistia stratiotes (water lettuce)	A free-floating aquatic plant that has been recorded in water bodies across the country, especially in stagnant and slow-moving waters. May form extensive floating colonies that harm other species. Has been specified as an invasive species in Zimbabwe

[1] www.iucngisd.org

[2] BirdLife International (2018) Important Bird Areas factsheet: Nyanga mountains: www.birdlife.org, accessed 9 November 2018

[3] CABI Invasive Species Compendium 2018: www.cabi.org/ISC/, accessed 9 November 2018

[4] Hyde M.A., Wursten B.T., Ballings P. and Coates Palgrave M. 2018. '*Flora of Zimbabwe. Species information*: *Hedychium gardnerianum*': www.zimbabweflora.co.zw/speciesdata/species.php?species_id=116120, accessed 9 November 2018

[5] Hyde M.A., Wursten B.T., Ballings,P. and Coates Palgrave, M. 2018. '*Flora of Zimbabwe: Species information*: *Lantana camara*: www.zimbabweflora.co.zw/speciesdata/species.php?species_id=148630, accessed 9 November 2018

[6] CABI Invasive Species Compendium 2018: www.cabi.org/ISC/datasheet/29771, accessed 9 November 2018

[7] Gurira N.A. and Ngulube P. 2016. 'Using contingency valuation approaches to assess sustainable cultural heritage tourism use and conservation of the outstanding universal values at Great Zimbabwe World Heritage Site in Zimbabwe'. *Procedia – Social and Behavioral Sciences* 225:291-302

[8] Mathenge C.W. Holford P., Hoffmann J.H., Zimmermann H.G., Spooner-Hart R. and Beattie G.A.C. 2009.'Distinguishing suitable biotypes of *Dactylopius tomentosus* (*Hemiptera: Dactylopiidae*) for biological control of *Cylindropuntia fulgida* var. *fulgida* (*Caryophyllales: Cactaceae*) in South Africa'

[9] www.ema.co.zw/index.php/158-community-projects.html

Table 2 Target 8: The INFORM Risk Index and its three dimensions for Zimbabwe

	Value	Rank out of 191 countries	Risk
INFORM Risk	5.2	38	High
Hazard and exposure	4.7	58	Medium
Vulnerability	5.2	46	High
Lack of coping capacity	5.7	54	High

Source: INFORM Global Risk Index Results 2018: www.inform-index.org

Table 2 Target 9: Management effectiveness assessment of Chimanimani National Park

Methodology and year	Threats		Severity	Impact	Overall threat score	Habitat condition score (state)	Conservation action (response) and result
Birdlife IBA (2011)	Agricultural expansion and intensification	Annual and perennial non-timber crops; smallholder farming	Slow but significant deterioration	Low	High	Near favourable	• No management planning • Substantive conservation measures are being implemented but these are not comprehensive and are limited by lack of resources and capacity • Low-level conservation response
		Livestock farming and ranching, including forest grazing; smallholder grazing, ranching and farming	Slow but significant deterioration	Low			
		Wood and pulp plantations, including afforestation; agro-industry plantations	Slow but significant deterioration	Low			
	Biological resource use	Logging and wood harvesting – unintentional effects on a large scale	Slow but significant deterioration	Medium			
	Energy production and mining	Mining and quarrying	Slow but significant deterioration	Medium			
	Invasive and other problematic species and genes	Invasive non-native or alien species and diseases of unspecified species	Slow but significant deterioration	Medium			
	Natural system modifications	Fire and fire suppression; increase in fire frequency and intensity	Moderate to rapid deterioration	High			

Table 2 Target 10: Summary of the IUCN Red List of threatened species in Zimbabwe

Category	Plants	Animals
Critically endangered	0	10
Endangered	12	14
Vulnerable	37	32
Lower risk: conservation dependent	0	0
Near threatened	13	41
Least concern	364	1,346
Data deficient	6	32

Adapted from the IUCN Red List of Threatened Species: www.iucnredlist.org/

Table 2 Target 13: Programmes and initiatives addressing ecosystem degradation in Zimbabwe

Title of programme	Focal areas	Objectives	Comments
Global Environment Facility support for UN Convention to Combat Desertification (UNCCD) 2018 National Reporting Process – Umbrella II	Land degradation	To enable country parties to collect necessary biophysical and socio-economic data, establish sound reporting and monitoring systems at national level and report in line with the UNCCD strategy	Zimbabwe's progress report on reviewing performance and assessing implementation of the UNCCD for the seventh reporting has been produced and submitted
Strengthening biodiversity and ecosystems management and climate-smart landscapes in the mid to lower Zambezi Region of Zimbabwe	Land degradation, biodiversity and climate change	To reduce key threats for wildlife, habitat and livelihoods of local communities in the lower Zambezi Valley	The project started in July 2018 and will run until December 2024
Management of competing water uses and associated ecosystems in Pungwe, Busi and Save basins	International waters	To strengthen transboundary cooperation and management of water resources and associated ecosystems for improved water security, climate change resilience and sustainable livelihoods in the shared Pungwe, Busi and Save basins in Zimbabwe and Mozambique	The project was approved in 2017. Among its projected contributions to environmental benefits are: • Water-food-ecosystems security and combined management of surface and groundwater in at least three freshwater basins • Enhance the level of transboundary collaboration between Zimbabwe and Mozambique which will reduce the threats to the three international water systems • Contribute towards the reduction of pollution in international waters from nutrient enrichment and other land-based activities • Contribute towards reduced vulnerability to climate variability and climate-related risks, and increased ecosystem resilience • Contribute towards sustained aquatic ecosystems goods and services, including globally significant biodiversity, as well as maintained capacity of natural systems to sequester carbon
Regional project on the development of national action plans for artisanal and small-scale gold mining in Africa	Chemicals and waste	Development of national action plans to reduce the use of mercury and mercury compounds and emissions and release of mercury into to the environment through artisanal and small-scale gold mining and processing is facilitated by the use of scientific and technical knowledge and tools by national stakeholders in participating countries	The project was approved for implementation in September 2016. It will assess mercury use in the artisanal and small-scale gold mining (ASGM) sector and related emissions and releases in participating countries. It will not take direct action, but assessments and the national overview of the ASGM sector will assist countries to identify priority issues in relation to human health and the environment, where socio-economic and environmental considerations will be identified

Table 2 Target 13 (continued)

Title of programme	Focal areas	Objectives	Comments
Integrated health and environment observatories and legal and institutional strengthening for the sound management of chemicals in Africa (African ChemObs)	Chemicals and waste	To contribute to improved health and environment through strengthening of national and regional institutions, and implementing priority chemicals and waste-related interventions	The project was approved for implementation in April 2017. Its expected contribution to global environmental benefits includes disposal of 1,000 metric tons of persistent organic pollutants (POPs). Under this project, Zimbabwe prioritized the establishment of monitoring and evaluation for POPs risks to human health and the environment
Hwange-Sanyati biological corridor project	Biodiversity, land degradation and climate change	To develop land use and resource management capacity of managers and communities in the HSBC	The project supports the conservation and sustainable use of biodiversity by strengthening the management of Hwange National Park and its buffer area, and was approved for implementation in April 2014. It has four focal areas: • Biodiversity – supports the conservation and sustainable use of biodiversity by strengthening the management of Hwange National Park and its buffer area • Land degradation – contributes to developing tools for arresting and reversing current trends in land degradation in the Sanyati catchment area • Climate change – supports the development of good management practices in land use, land-use change and forestry (LULUCF) in forest lands and the wider landscape, aiming to promote forest conservation and reforestation and sustainable forest management • Sustainable forest management/REDD – supports the reduction of pressures on the remaining forest of the HSBC by developing SFM tools
Review and update of the national implementation plan for the Stockholm Convention on POPs	Persistent organic pollutants	To review and update the national implementation plan in order to comply with reporting obligations (Article 15) and updating of national implementation plans (Article 7) under the Stockholm Convention	
Sustainable afforestation	Land degradation	To provide a sustainable source of timber for use in the tobacco industry in Zimbabwe and to investigate and implement strategies for the conservation and rejuvenation of existing indigenous and commercial forests	The initiative was launched in 2012 by the tobacco merchant companies in Zimbabwe and supported by the Tobacco Industry and Marketing Board and the Ministry of Agriculture. Its aim is to reduce the environmental degradation caused by tobacco production

Table 2 Target 17: Profile of Zimbabwe's ACI capacity in science, technology and innovation

ACI composite index	Score
ACI composite index value	46.3
Level of capacity development	Medium
Assessment of capacity development areas: Component index values	
Policy choices for capacity development	60.9
Development cooperation effectiveness	61.3
Gender equality mainstreaming and social inclusion	86.7
Partnering for capacity development	50.0
Capacity profiling and capacity needs assessment	0.0
Domestic resource mobilization (tax effort index 1996-2013)	1.59

Source: African Capacity Building Foundation: www.acbf-pact.org/

Table 3 Target 1: Awareness activities about biodiversity and the environment undertaken by EMA and other agencies

	2015		2016	
	Activities	People reached	Activities	People reached
Commemorations	**8**	**42,463**		
World Wetlands Day			10	13,450
Africa Environment Day			13	920
National Fire Week launch			92	61,533
World Day to Combat Desertification			10	5,000
Clean Up Zimbabwe campaign			10	13,450
National Tree Planting Day			10	6,792
Exhibitions	**36**	**46,563**		
Zimbabwe International			1	7,678
Mine Entra			1	784
Agricultural shows			59	59,945
Youth Expo			1	2,500
Careers days			20	7,295
Schools environmental programmes				
Schools environmental projects competition		1,055 schools		1,386 schools
Debate competition		720 schools		
Environmental talk shows	543	63,617	1,343	188,459
School clubs				580 registered
Anti-litter activities				
Waste management roadblock awareness	1,069	259,741	42	8,280
Clean-up campaigns	538	65,335	1,751	
Electronic media programmes				
TV programmes	92	2,100,000	73	8,000,000
Radio programmes	119		119	
Films	22	7000		
Website		11,508 views		
Print media				
Articles	575	1,500,000	964	7,100,000
Social media				
Facebook and Twitter		13,680		27,274
Other activities				
Road shows	1,384	395,876	1,229	479,722
Mobile awareness	474	122,470	964	600,000
Media tours	42		55	
Publicity and promotional materials			277,460	
Meetings and workshops	3,588	69,964	3,811	138,653

Table 3 Target 5: Conservation actions taken at key biodiversity areas

Area	Conservation coverage	Management planning	Conservation action	Result of action
Nyanga mountains	Most of site (50-90%) covered, including the most critical parts for important bird	Comprehensive and appropriate management plan exists that aims to maintain or improve the populations of qualifying bird species	Conservation measures are being implemented but these are not comprehensive and are limited by resources and capacity	Medium
Nyanga lowlands and Honde valley	Protected area overlap with site	Management plan exists that aims to maintain or improve the populations of qualifying bird species	Conservation measures are being implemented but these are not comprehensive and are limited by resources and capacity	Medium
Stapleford Forest	Whole area of site (>90%) covered by appropriate conservation designation	A management plan exists but it is out of date or not comprehensive	Limited conservation initiatives are in place	Medium
Bvumba Highlands	Protected area	Unknown	Conservation measures limited by resources and capacity	Unknown
Banti Forest Reserve	Protected area	Unknown	Conservation measures limited by resources and capacity	Unknown
Chimanimani mountains	Whole area of site (>90%) covered by appropriate conservation designation	No management planning has taken place	Substantive conservation measures are being implemented but these are not comprehensive and are limited by resources and capacity	Low
Haroni-Rusitu junction and botanical reserves	Protected area	Unknown	Conservation measures limited by resources and capacity	Unknown
Chirinda Forest	Whole area of site (>90%) covered by appropriate conservation designation	Unknown	Substantive conservation measures are being implemented but these are not comprehensive and are limited by resources and capacity	Low
Hwange National Park	Whole area of site (>90%) covered by appropriate conservation designation	A management plan exists but it is out of date or not comprehensive	Substantive conservation measures are being implemented but these are not comprehensive and are limited by resources and capacity	Medium
Chizarira National Park	Whole area of site (>90%) covered by appropriate conservation designation	No management planning has taken place	Substantive conservation measures are being implemented but these are not comprehensive and are limited by resources and capacity	Low

Table 3 Target 5 (continued)

Area	Conservation coverage	Management planning	Conservation action	Result of action
Batoka gorge	Some of site covered (10-49%)	No management plan exists but management planning has begun	Very little or no conservation action taking place	Low
Middle Zambezi Valley	Whole area of site (>90%) covered by appropriate conservation designation	A comprehensive and appropriate management plan exists that aims to maintain or improve the populations of qualifying bird species	Substantive conservation measures are being implemented but these are not comprehensive and are limited by resources and capacity	High
Lake Chivero Recreational Park	Whole area of site (>90%) covered by appropriate conservation designation	A management plan exists but it is out of date or not comprehensive	Substantive conservation measures are being implemented but these are not comprehensive and are limited by resources and capacity	Medium
Sebakwe Poort	Protected area	Unknown	Conservation measures limited by resources and capacity	Unknown
Wabai Hill (Debshan Ranch)	Private ranch or sanctuary	Unknown	Conservation measures limited by resources and capacity	Unknown
Matobo hills	Some of site covered (10-49%)	Unknown	Substantive conservation measures are being implemented but these are not comprehensive and are limited by resources and capacity	Low
Driefontein grasslands	Little or none of site covered (<10%)	No management planning has taken place	Limited conservation initiatives are in place	Negligible
Limpopo - Mwenezi flood-plain and pans	Little or none of site covered (<10%)	No management plan exists but management planning has begun	Limited conservation initiatives are in place	Low
Mavuradonha mountains	Most of site (50-90%) covered, including the most critical parts for important bird	No management planning has taken place	Very little or no conservation action taking place	Low
Save-Runde junction	Whole area of site (>90%) covered by appropriate conservation designation	A comprehensive and appropriate management plan exists that aims to maintain or improve the populations of qualifying bird species	Substantive conservation measures are being implemented but these are not comprehensive and are limited by resources and capacity	High

Table 3 Target 7: Non-native animal species that were identified for monitoring in NBSAP2

Species	Comment
Acridotheres tristis (Indian mynah)	The common mynah or Indian mynah is native to Asia but is now widely spread across the globe. It competes with small mammals and birds for nesting hollows, is known to prey on other birds' eggs and chicks and may also attack adults of some small birds, and thus threatens native fauna and biodiversity.[1] It is resident in Zimbabwe,[2] but an assessment of its distribution and impact is still to be done
Bactrocera invadens (Oriental fruit fly)	A highly invasive species that is native to Asia and is now found in at least 65 countries across the globe. It is a very destructive pest for a wide variety of fruits and vegetables; damage levels can be as much as 100%. This pest is considered to be a major threat in many countries, requiring costly quarantine restrictions and eradication measures. Its impact on the environment and biodiversity is rated high since its establishment would likely invite chemical or biological control programmes, and chemical control would generally be harmful to native insects and species of conservation significance. In Zimbabwe, the first specimens of the oriental fruit fly were caught in April 2010 approximately 71 km southeast of Harare.[3] Zimbabwe has an in-country fruit fly surveillance and eradication programme under Plant Quarantine Services Institute and Plant Protection Research Institute, both of which are housed in the Department of Research and Specialist Services
Cherax quadricarinatus (Australian redclaw crayfish)	The presence of a feral population of the Australian red claw crayfish in Zimbabwe was first reported in 2007 on Lake Kariba. Although it has been spreading across the lake (and there have been reports of sightings of the species in other water bodies in the country), the population of the crayfish on the Zimbabwean side has remained low. Among freshwater invasive alien species, crayfish are recognized as having high potential to alter ecosystems,[4] since as generalists they tend to affect benthic food webs, readily consuming terrestrial leaf litter, benthic algae, macrophytes, aquatic invertebrates, fish eggs and detritus. The implications of the occurrence of *C. quadricarinatus* for the ecology of the invaded systems in Zimbabwe are still to be determined
Prostephanus truncatus (Larger grain borer)	Indigenous in Central America, tropical South America and the south of the USA, the larger grain borer is a serious pest of stored maize and dried cassava roots[5]
Sitophilus zeamais (Maize weevil)	A significant pest of cereals but predominantly associated with maize. It is a major pest in stored maize throughout the world, causing heavy losses especially under small-scale farmer storage in developing countries[6]
Trogoderma granarium (khapra beetle)	Believed to be a native of the Indian subcontinent, the khapra beetle is now prevalent in certain areas of the Middle East, Africa and South Asia.[7] This serious pest of groundnut, cotton, barley, rice, millet, sorghum, wheat and maize[7] is widespread in Zimbabwe.[8] If left undisturbed in stored grain, it can cause weight loss of 5-30% and in extreme cases up to 70%; it may lead to significant reduction in seed viability[9]

[1] CABI Invasive Species Compendium 2018. *Acridotheres tristis* (common mynah): www.cabi.org/ISC/datasheet/2994, accessed 15 November 2018

[2] BirdLife International 2018. 'Species factsheet: *Acridotheres tristis*': www.birdlife.org. accessed 15 November 2018

[3] EPPO Global Database 2018. '*Bactrocera dorsalis*: Distribution details in Zimbabwe': https://gd.eppo.int/taxon/DACUDO/distribution/ZW, accessed 15 November 2018

[4] Pilotto F., Free G., Crosa G., Sena F., Ghiani M. and Cardoso A.C. 2008. 'The invasive crayfish *Orconectes Limosus* in Lake Varese: Estimating abundance and population size structure in the context of habitat and methodological constraints'. *Journal of Crustacean Biology* 28:633–640

[5] CABI Invasive Species Compendium 2018. '*Prostephanus truncatus* (larger grain borer)': www.cabi.org/ISC/datasheet/44524, accessed 16 November 2018

[6] Giga D.P. and Mazarura U.W. 1991. 'Levels of resistance to the maize weevil, *Sitophilus zeamais* in exotic, local open-pollinated and hybrid germplasm'. *Insect Science and its Application* 12:159-169

[7] CABI Invasive Species Compendium 2018. '*Trogoderma granarium* (khapra beetle)': www.cabi.org/ISC/datasheet/55010, accessed 15 November 2018

[8] EPPO Global Database 2018. '*Trogoderma granarium*: Distribution details in Zimbabwe': https://gd.eppo.int/taxon/TROGGA/distribution/ZW, accessed 15 November 2018

[9] Global Invasive Species Database 2018. '*Trogoderma granarium*': http://issg.org/database/species/ecology.asp?si=142&fr=1&sts=sss&lang=EN, accessed 16 November 2018

Table 3 Target 8: Risk dimensions and components for Zimbabwe

Hazard and exposure		Vulnerability		Lack of coping capacity	
Component	Value	Component	Value	Component	Value
Natural	4.6	Socio-economic	6.0	Institutional	5.1
Floods	6.0	Development	7.3	DRR	2.6
Cyclones	0.4	Inequality	7.2	Governance	7.6
Earthquakes	0.2	Aid dependency	2.2	Infrastructure	6.3
Tsunamis	0.0	Vulnerable groups	4.3	Communication	5.8
Droughts	9.3	Uprooted people	2.8	Access to health	6.3
Human	4.4	Other vulnerable groups	5.5	Physical infrastructure	6.8
Current conflicts	0.0				
Conflict risk	6.9				

Source: INFORM Global Risk Index Results 2018: www.inform-index.org

Table 3 Target 9: Management effectiveness assessment of Chirinda State Forest

Methodology and year	Threats	Severity	Impact	Overall threat score	Habitat condition score (state)	Conservation action (response) and result
Birdlife IBA (2011)	• Agricultural expansion and intensification • Livestock farming and ranching, including forest grazing; smallholder grazing, ranching or farming	No or imperceptible deterioration	Low	High	Near favourable	• Whole area of site (>90%) covered by appropriate conservation designation • Management planning unknown • Substantive conservation measures being implemented but are not comprehensive and are limited by resources and capacity • Low-level conservation response
	• Unsustainable harvesting of terrestrial plants; unintentional effects (species being assessed is not the target) • Hunting and collecting terrestrial animals; unintentional effects (species is not the target)	Slow but significant deterioration	Medium			
	Invasive non-native or alien species or diseases of named species	Moderate to rapid deterioration	High			
	Residential and commercial development	No or imperceptible deterioration	Low			

Table 3 Target 10: Plant species in Zimbabwe that are listed as endangered on the IUCN Red List of threatened species in Zimbabwe

Plant species	Habitat	Range, population and population trend	Threats	Conservation actions in place	Conservation actions needed
Podocarpus henkelii (Henkel's yellowwood)	Forest – subtropical or tropical moist montane; often on steep, rocky slopes at altitudes of between 1,300 m and 2,000 m above sea level	• Recorded in South Africa, Malawi, Tanzania, and Zimbabwe. • Global population extremely fragmented and decreasing • Information about trends in Zimbabwe is lacking	• Logging and wood harvesting • Deforestation largely through smallholder farming	None	There is a need to determine its distribution and status in Zimbabwe
Warburgia salutaris (pepper bark tree)	Occurs in savanna woodland, coastal forest and Afromontane forest	• Recorded in eSwatini, Mozambique, South Africa and Zimbabwe • Current population trend is unspecified • Very rare in Zimbabwe, and believed by some to be rare in the wild[1]	• Exploitation of bark, stems and roots for use in traditional medicine • Habitat loss due to agricultural activities, expansion of human habitation and logging for firewood and timber	Specimens in the herbarium and Chirinda Forest	Survey in the wild
Bersama swynnertonii (purple bersama)	Confined to areas of moist forest and kloofs	• Endemic to Zimbabwe. • Occurs in Chirinda forest, near the Chimanimani mountains and in forest near Stapleford • Rare species	• Annual and perennial non-timber crops • Livestock farming and ranching • Logging and wood harvesting	None	Population survey
Encephalartos chimanimaniensis (Chimanimani cycad)	Grows in high-rainfall montane grassland on granite mountains; associated with schist and quartzite	• Known only in the Chimanimani mountains on the border between Zimbabwe and Mozambique • Population decreasing	Over-collecting for ornamental purposes	Listed on Appendix I of the CITES Appendices	Population survey

[1] Hyde M.A., Wursten B.T., Ballings P. and Coates Palgrave M. 2019. 'Flora of Zimbabwe: Species information: *Warburgia salutaris*': www.zimbabweflora.co.zw/speciesdata/species.php?species_id=140560, retrieved 21 December 2018

Table 3 Target 10 (continued)

Plant species	Habitat	Range, population and population trend	Threats	Conservation actions in place	Conservation actions needed
Encephalartos concinnus (Runde cycad)	Rocky areas such as inland cliffs and mountain peaks; savanna, grassland	• Endemic to Zimbabwe • A total of 210-500 mature individuals • Population decreasing	Over-collecting for ornamental purposes	• Occurs in at least one protected area the Bubiana Conservancy • Listed on Appendix I of the CITES Appendices. • Listed on Annex A of EU Wildlife Trade Regulations	• Site or area protection • Ex-situ conservation (captive breeding or artificial propagation) • Education, awareness and communications • Survey population size, distribution and trends; life history and ecology • Harvest, use and livelihoods
Coffea salvatrix (*Mukofi*)	• Occurs in humid, evergreen forest or seasonally dry, mixed evergreen-deciduous forest • Experiencing continuing decline in area, extent and quality of habitat	• Occurs in Zimbabwe, Malawi, Mozambique and Tanzania • Population severely fragmented; exact population size and trend unknown.	• Livestock farming and ranching • Human disturbance and intrusion • Habitat shifting and alteration • Droughts • Temperature extremes	Found within protected areas in Zimbabwe, the Ngungunyana State Forest and Chirinda State Forest	• Site or area management • Habitat and natural process restoration • Ex-situ conservation • Genome resource bank • Education, awareness and communication • Survey opulation size, distribution and trends; life history and ecology; threats; habitat trend
Raphionacme chimanimaniana	Occurs on rocky ground on quartzite slopes and possibly on granite Known from ca 1,400 m altitude.	• Restricted to the Chimanimani mountains and Chikukwa's Kraal in Zimbabwe • Population decreasing	Increased human settlement	• No specific conservation measures or management plan • Protected within Chimanimani National Park • The second location, Chikukwa, is not protected	• Site or area protection • Resource and habitat protection • Survey population size, distribution and trends • Assess threats

Table 3 Target 10 (continued)

Plant species	Habitat	Range, population and population trend	Threats	Conservation actions in place	Conservation actions needed
Indigofera chimanimaniensis	Of the two known collections, one is recorded from grassland and the other has no habitat data	• Restricted to Chimanimani District and known only in two localities – Kasipiti and Chikukwa's Kraal – with an estimated AOO of only 8 km² • No quantitative population data available but population is decreasing	Low threat levels from low-level commercial agriculture, which since 2000 has decreased	• No specific conservation measures or management plan • One of the two known localities is within the Martin Forest Reserve which is afforded some protection, whilst the second is not protected	• Site or area protection • Survey population size, distribution and trends • Assess threats
Rhynchosia chimanimaniensis	• Upland bushland, scrub and grassland and on steep rocky slopes, at 1,525-1,980 m altitude • Experiencing decline in area, extent and/or quality of habitat	• Recorded in the Chimanimani mountains, Albany Farm and Mt Pene in Zimbabwe and Rotanda in Mozambique • Known in 10 locations; no quantitative population data are available • Population decreasing	Habitat disturbance from agriculture at one of the Albany Farm localities but no disturbance at the other two localities	• No specific conservation measures or management plan • Species recorded in the Chimanimani National Park • Other known localities are not protected.	• Site or area protection • Survey population size, distribution and trends
Danthoniopsis chimanimaniensis	Recorded in rocky riverbanks, edges of pools, on rocks in streams and rivers and in shaded moist areas among boulders and the base of rock faces; at 360-1,600 m altitude	• Restricted to the Chimanimani mountains of Zimbabwe and Mozambique • No quantitative population data; known from 17 collections and uncommon to locally common within its range • Population decreasing	Mining and quarrying	• No specific conservation measures or management plan • Species protected within the Chimanimani National Park	• Site or area protection • Survey population size, distribution and trends • Assess threats

Table 3 Target 17: Profile of Zimbabwe's global innovative index for 2014 to 2018

INDEX	2014 (143 countries)			2015 (141 countries)			2017 (127 countries)			2018 (126 countries)		
	Score	Rank		Score	Rank		Score	Rank		Score	Rank	
Innovation input sub-index	**27.18**	**136**	o	**26.61**	**134**		**28.0**	**124**	o	**28.93**	**121**	
Institutions	**26.69**	**142**	o	**25.90**	**140**	o	**35.7**	**125**	o	**36.4**	**124**	□
Political environment	38.97	129	o	28.85	122		31.3	114		27.8	121	◊
Regulatory environment	0.73	143	o	1.48	140	o	32.9	121		38.7	117	◊
Business environment	40.37	134	o	47.36	136	o	42.9	126	o	42.7	125	□
Human capital and research	**12.38**	**133**	o	**19.00**	**104**		**28.7**	**79**		**27.0**	**77**	♦
Education	14.06	138	o	31.86	110		54.5	42	●	49.4	58	♣
Tertiary education	22.17	95		24.61	87		31.3	77		31.3	65	♦
Research and development	0.89	121	o	0.54	118		0.3	111		0.3	112	
Infrastructure	**22.75**	**121**	o	**20.80**	**129**		**15.5**	**127**	o	**20.3**	**126**	□
Information and communication technologies	18.50	115	o	31.55	101		26.9	111		27.5	111	
General infrastructure	28.07	96		9.12	139	o	13.1	125	o	13.6	125	□
Ecological sustainability	21.68	126		21.75	131		6.4	127	o	20.0	123	
Market sophistication	**46.35**	**83**		**40.70**	**109**		**37.2**	**105**		**41.3**	**97**	
Credit	21.95	122		20.50	114		25.1	98		22.6	109	
Investment	41.29	48	●	35.97	64	●	38.1	75		53.3	26	
Trade, competition, and market scale	75.82	66	o	65.62	114		48.4	108		48.0	104	
Business sophistication	**27.72**	**97**		**26.66**	**115**		**22.8**	**114**		**19.6**	**116**	◊
Knowledge workers	25.23	109	●	23.37	112		23.1	104		17.5	107	
Innovation linkages	40.00	42		24.61	104		20.2	106		20.2	105	
Knowledge absorption	17.92	112	o	32.01	76		25.2	97		21.0	101	

♣ indicates a general strength as well as an income group strength; ● a strength; ♦ an income group strength; □ a general weakness as well as an income group weakness; o a weakness; ◊ an income group weakness

Table 3 Target 17 (continued)

INDEX	2014 (143 countries)			2015 (141 countries)			2017 (127 countries)			2018 (126 countries)		
	Score	Rank		Score	Rank		Score	Rank		Score	Rank	
Innovation output sub-index	**21.45**	**111**		**18.42**	**120**		**15.6**	**116**		**17.36**	**99**	
Knowledge and technology outputs	**17.42**	**122**		**18.42**	**130**		**14.0**	**110**		**19.3**	**83**	♦
Knowledge creation	14.54	65	•	9.54	74		7.6	76		10.4	68	♦
Knowledge impact	35.77	78		23.94	121		21.1	104		36.9	63	♣
Knowledge diffusion	1.96	138	o	3.56	133		13.3	130		10.6	119	
Creative outputs	**25.48**	**101**		**24.49**	**103**		**17.2**	**113**		**15.4**	**113**	
Intangible assets	46.25	59		44.00	76		28.2	112		26.1	115	
Creative goods and services	8.60	101		9.59	97		8.4	95		9.0	96	
Online creativity	0.83	128		0.38	120		4.1	113		0.4	110	
Innovation efficiency ratio	**0.79**	**48**	•	**0.69**	**77**		**0.6**	**89**		**0.60**	**69**	
Global innovative index	**24.31**	**130**		**22.50**	**133**		**21.8**	**121**		**23.15**	**113**	

♣ indicates a general strength as well as an income group strength; • a strength; ♦ an income group strength; □ a general weakness as well as an income group weakness; o a weakness; ◊ an income group weakness

Table 4 Target 3: Operational, still to be commissioned, non-functional and potential mini- and micro-hydro power systems in Zimbabwe

Name of scheme	Date commissioned	Capacity (KW)	Status
Duru	2013	2,200	Operational
Nyamingura	2010	1,100	Operational
Pungwe A	2013	2,705	Operational
Pungwe B	2015	15,250	Operational
Pungwe C	2016	3,750	Operational
Rusitu		750	Operational
Kupinga	2017	1,600	Operational
Hauna	2017	2,300	Operational
Claremont	2017	300	Operational
Nyangani	2016	2,720	Operational
Chipendeke	2010	27	Operational
Claremont	-	30	Non-
Dazi	2011	29	Operational
Himalaya	2013	80	Operational
Hlabiso	2013	30	Operational
Ngarura	2013	30	Operational
Nyafaru	1990	20	Operational
Nyamwanga	2013	30	Operational
Nyamarimbira	2003	30	Non-
Svinurai	2005	30	Non-
Chitofu, Rusape	-	20	Non-
Manyuchi	-	1 400	Potential
Mutirikwi	-	5 000	Potential
Osborne	-	3 000	Potential
Siya	-	900	Potential
Gairezi	-	30 000	Potential
Tsanga	-	3 300	Potential

Table 4 Target 6: Water quality status, Zimbabwe

Item	Year	Value
Proportion of bodies of water with good ambient water quality (%)	2017	76.47
Degree of integrated water resources management implementation (%)	2017	61
Proportion of transboundary river and lake basins with an operational arrangement for water cooperation (%)	2017	76.2
Level of water stress: freshwater withdrawal as a proportion of available freshwater resources (%)	2014	24.29

Source: https://unstats.un.org

Table 4 Target 9: Management effectiveness assessment of Chizarira National Park

Methodology and year	Threats		Severity	Impact	Overall threat score	Habitat condition score (state)	Conservation action (response) and result
Birdlife IBA (2011)	Human intrusions and disturbance	Work and other activities	Slow but significant deterioration	Low	High	Favourable	• Whole area of site (>90%) covered by appropriate conservation designation • Management plan is being drafted • Substantive conservation measures being implemented but are not comprehensive and are limited by resources and capacity
	Invasive and other problematic species and genes	Invasive non-native and alien species and diseases	No or imperceptible deterioration	Low			
	Natural system modifications	Fire and fire suppression – increase in fire frequency/intensity	Slow but significant deterioration	High			

Table 4 Target 10: Plant species listed as vulnerable on the Red List of Threatened Species in Zimbabwe

Plant species	Population trend					Threats							Conservation actions		
	Unknown	Unspecified	Decreasing	Stable	Increasing	Habitat	Agriculture	Fire	Mining	Housing	IAS	Harvesting	None	Occurs in PA	CITES Listing
Habenaria stylites		■				■									Ap II
Coffea zanguebariae		■				■	■		■	■	■			■	
Ocotea kenyensis		■				■	■					■	■		
Euphorbia lividiflora		■								■			■		
Allophylus chirindensis		■										■		■	
Vitellariopsis ferruginea		■													
Khaya anthotheca		■										■			
Prunus africana		■					■			■		■			
Tannodia swynnertonii		■												■	
Cola mossambicensis		■													
Synsepalum kassneri		■												■	
Encephalartos manikensis			■									■		■	Ap I
Coffea ligustroides			■				■				■			■	
Ansellia africana			■			■	■					■		■	Ap II
Schistostephium oxylobum			■			■	■						■	■	
Centella obtriangularis			■										■		
Gutenbergia westii			■			■	■					■	■	■	
Erica lanceolifera			■			■	■						■	■	
Streptocarpus hirticapsa	■												■	■	
Dierama plowesii			■				■						■	■	
Syncolostemon oritrephes	■							■					■	■	
Syncolostemon ornatus			■				■						■	■	
Aeschynomene aphylla			■										■	■	
Crotalaria insignis			■				■	■					■	■	
Tephrosia praecana			■			■	■						■	■	
Dissotis pulchra			■										■	■	
Dissotis swynnertonii			■										■	■	
Protea enervis			■										■	■	
Vepris drummondii			■										■	■	
Buchnera subglabra				■									■	■	
Aloe ballii	■							■						■	
Aloe musapana	■						■	■					■		Ap II
Aloe plowesii	■												■	■	Ap II
Aloe rhodesiana			■			■	■				■		■	■	Ap II
Xyris asterotricha			■										■	■	
Otiophora lanceolata			■					■					■	■	
Dioscorea sylvatica			■									■	■	■	

Habitat = Habitat degradation and loss; Agriculture = Agricultural activities; CC = Climate change; IAS = Invasive alien species; None = No specific conservation measures or management plan is in place; Occurs in PA = Occurs in a Protected Area; CITES listing (Ap I = Appendix I)

Table 4 Target 12: Summary description of Zimbabwe Resilience Building Fund projects

Project and project life	Lead organization and consortium members	Target districts and population	Objective and specific objectives	Activities
Enhancing community resilience and sustainability July 2016 to July 2019	**Lead:** CARE International Crops Research Institutes for Semi-arid Tropics (ICRISAT)	Chiredzi and Mwenezi (34 wards) **Households targeted:** 10,500	Enhancing household and community resilience by improving their absorptive, adaptive and transformative capacities **Specific objectives:** • Household and community capacities and assets built to deal with economic and climate-related shocks and stresses • Economic and climate-related drivers of risk reduced in targeted communities • Leaders and service providers improved in creation of an enabling environment for resilient livelihoods	• Livestock production • Crop production and productive assets • Early warning system • Private sector engagement and market linkages • Climate adaptation
Matabeleland enhanced livelihoods, agriculture and nutrition adaptation July 2016 to July 2019	**Lead:** Welthungerhilfe • Community Technology Development Organization • Institute of Environmental Studies • Agricultural Partnerships Trust	Nkayi, Bubi, Umguza, Umzingwane (54 wards) **Households targeted**: 30,989	To contribute to increased capacities of communities to protect development gains and achieve improved well-being outcomes in the face of shocks and stresses **Specific objectives:** • Capacitate institutions in resilience planning and implementation • Support communities to increase agricultural production and diversify livelihood options • Support commercially oriented farmers to increase income levels and • Strengthen community social safety nets	• Livestock production • Crop production and apiculture • Early warning system • Private sector engagement and market linkages • Climate adaptation • Productive assets
Zambezi Valley Alliance for Building Community July 2016 to July 2019	**Lead:** Action Aid • United Methodist Committee on Relief Zimbabwe • Environmental Law Association • African Breeders Services Total Cattle Management	Binga, Kariba, Mbire (45 Wards) **Households targeted:** 45,105	To increase the resilience capacity of communities to protect development gains and achieve improved well-being in the face of shocks and stresses related to seasonal drought in a sustainable manner **Specific objectives:** Improved absorptive, adaptive and transformative capacity for the targeted at-risk communities	• Livestock production • Crop production • Entrepreneurship and apiculture • Water, sanitation and hygiene • Early warning system • Private sector engagement and market linkages • Productive assets • Climate adaptation

Table 4 Target 12 (continued)

Project and project life	Lead organization and consortium members	Target districts and population	Objective and specific objectives	Activities
Building resilience through improving the absorptive and adaptive capacity for transformation October 2017 to October 2020	**Lead:** Christian Aid • Silveira House • Bio-Innovation Zimbabwe Trust • Cluster Agricultural Development Services • Nyahurune Community Trust	Mutoko and Mudzi (29 wards) **Households targeted:** 15,505	Ensuring that households' and communities' livelihoods are able to withstand existing and future shocks and stresses and achieve well-being outcomes **Specific objectives:** • To improve the capacity of 29 targeted communities (41,230 households – 3,365 directly) to anticipate, prepare and respond to shocks and stresses in order to maintain productive capacity • To develop diversified, viable livelihood options adapted to climatic and socio-economic shocks and stresses for 12,140 targeted households and communities • To strengthen community voices and ability to engage service providers and enhance their participation in decision making	• Livestock production • Crop production and apiculture • Non-timber and forest products • Early warning system • Private sector engagement and market linkages • Climate adaptation • Strengthening existing social savings groups, new internal savings and lending groups and savings and credit cooperative societies, and inking rural SMEs
Enhancing community resilience and inclusive market systems October 2017 to October 2020	**Lead:** CARE • Lutheran Development Services • ICRISAT • Local Initiatives for Development Agency	Zvishavane and Mberengwa (50 wards) **Households targeted:** 31,000	Increased resilience of households and inclusive market systems in at-risk communities in Mberengwa and Zvishavane **Specific objectives** • Household and community capacities and assets built to deal with economic and climate related shocks and stresses • Relevant value chains are profitable and able to withstand shocks and stresses • Improved responsiveness of market ecosystems to the needs of at-risk communities	• Livestock production • Crop production and apiculture • Private sector engagement and market linkages • Climate adaptation • Early warning system • Village savings and lending associations (VSLAs) • Commodity groups, Linking VSLAs

Table 4 Target 12 (continued)

Project and project life	Lead organization and consortium members	Target districts and population	Objective and specific objectives	Activities
Sizimele Action for Building Resilience in Zimbabwe July 2017 to July 2020	**Lead:** DanChurchAid • Institute for Rural Technologies • Organisation of Rural Technologies • TechnoServe and CBOs • ProAfrica and CBOs • Christian Youth Volunteers Trust (CyVAT) • Community Capacity Building Initiative • Future of Hope Foundation • Midlands State University • HWA Zimbabwe	Matobo, Insiza and Lupane (57 wards) **Households targeted:** 31,455	To build capacity for resilience through strengthened local disaster risk management systems, increased and diversified agricultural production, improved market linkages and asset accumulation, and supportive enabling environment for resilience **Specific objectives**: • Communities in 57 wards have access to information for decision making on weather-related shocks and relevant programmes • Improved crop and livestock asset base and productivity • Strengthened and diversified livelihoods and incomes for local economic development of 31,455 households • Integration of resilience models and new knowledge in national programmes, private sector and other local partners	• Livestock production • Crop production • District-level processing centres • Small livestock and cattle finishing posts • Private sector engagement • Climate adaptation • Insurance and productive assets early warning system • Internal savings and lending groups • Linkages with micro-finance institutions (MFIs), banks, impact investors, cattle banking and risk insurance
Program for Growth and Resilience (PROGRESS) (July 2017 to July 2020)	**Lead:** International Rescue Committee • CESVI • BIOHUB Trust • Matopos Research Institute • International Maize and Wheat Improvement Centre (CIMMYT)	Beitbridge and Nyanga (33 wards) **Households targeted:** 20,000	At least 20,000 target households have improved resilience and are food secure **Specific objectives:** • Increase in food consumption in households in target communities • Increase in sources of income among households in target communities • Women and youth play a greater role in household spending decisions	• High-value cash cropping • Crops • Livestock • Private sector engagement • Climate adaptation • Non-timber forestry products • Mechanization and service provision • Linkages between internal savings and lending groups, MFIs and banks

Table 4 Target 17: The objectives of the Multi-Year Plan of Action for South-South Cooperation on Biodiversity for Development, its indicative activities and Zimbabwe's implementation and support of the plan

Objectives by 2020	Indicative activities	Zimbabwe's implementation and support of the plan
Promote, enhance and increase South-South cooperation among parties in support of the 2011-2020 Strategic Plan and the Millennium Development Goals	Identify optimal matches between available technologies and needs assessed in developing countries and promote and support the exchange of scientific and technical knowledge and expertise	Sharing of innovative experiences through the UN Office for South-South Cooperation (UNOSSC), although the information so far shared is pre-2005[1]
	Promote and strengthen collaborative research and exchange of scientific, technical and technological know-how on biodiversity conservation and sustainable use among centres of excellence in developing countries, including joint gap analysis and strategic assessments	Through the SADC TFCA programme[2], Zimbabwe has been involved in promoting and strengthening collaborative research and exchange of scientific and technical knowledge on biodiversity conservation
	Revise NBSAPs and regional strategies and actions plans in view of 2011–2020 Strategic Plan, considering South-South cooperation, and report on progress through the fifth national reports	This was done
	Identify market and trade-oriented mechanisms for innovations in technology to favour biodiversity (public-private partnerships), including the integration of biodiversity considerations with relevant regional trade agreements and mainstreaming biodiversity into productive landscapes, seascapes and sectors	Agricultural commercialization in Zimbabwe[3] The EU, FAO and the Government of Zimbabwe partnered to assist poor smallholder farmers to boost production, productivity and engage in commercial agriculture through integrated farming approaches
	Facilitate projects and programmes aimed at joint conservation and sustainable use of cross-border ecosystems to further contribute towards halting biodiversity loss	The SADC transfrontier conservation area programme has facilitated the development of regional transboundary biodiversity conservation programmes in which Zimbabwe has participated[4]

[1] www.esupp.unsouthsouth.org/gssd-academy-solutions/, accessed 15 December 2018

[2] See the SADC TFCA portal at https://tfcaportalorg/

[3] FAO 2014 South-South Cooperation: A key to development: www fao.org/3/a-i4225.epdf

[4] www.sadcint/themes/natural-resources/transfrontier-conservation-areas/, accessed 15 December 2018

Table 4 Target 17 (continued)

Objectives by 2020	Indicative activities	Zimbabwe's implementation and support of the plan
Support South-South and triangular cooperation	Further engage United Nations regional economic commissions and treaties and their related agencies in South-South cooperation on biodiversity	Being party to a number of relevant multilateral environmental agreements has enabled Zimbabwe to engage a variety on regional and international agencies on South-South cooperation on biodiversity
	Strengthen the coordination and cooperation of developing countries and regional agencies in engaging other multilateral environmental agreements	Zimbabwe, through membership in multilateral environmental agreements, cooperates with countries and agencies on biodiversity issues
	Engage the private sector, regional development banks, NGOs, implementing agencies and centres of excellence and research from developing countries in South-South cooperation on biodiversity for development	A number of organizations are working on biodiversity related issues in Zimbabwe, including Africa Biodiversity Collaborative Group,[5] IUCN, UNDP and FAO

[5] www.abcg.org/

Table 5 Target 6: Hazardous waste compliance in 2015

Item	Value (%)
Compliance with the Montreal Protocol on hazardous waste and other chemicals	100
Compliance with the Basel Convention on hazardous waste and other chemicals	16.67
Compliance with the Rotterdam Convention on hazardous waste and other chemicals	50.98
Compliance with the Stockholm Convention on hazardous waste and other chemicals	33.33

Source: https://unstats.un.org/

Table 5 Target 9: Management effectiveness assessment of Hwange National Park

Methodology and year	Threats		Severity	Result	Overall threat score	Habitat condition score (state)	Conservation action (response) and result
Birdlife IBA (2011)	Agricultural expansion and intensification	Livestock farming and ranching, including forest grazing; smallholder grazing, ranching and farming	Slow but significant deterioration	Low	Medium	Near favourable	• Whole area of site (>90%) covered by appropriate conservation designation • Medium level of conservation response • A management plan is available and is being implemented • Substantive conservation measures are being implemented but these are not comprehensive and are limited by resources and capacity • Medium-level conservation response
	Invasive and other problematic species and genes	Problematic native species and diseases of named species	Slow but significant deterioration	Low			
	Natural system modifications	Fire and fire suppression – increase in fire frequency and intensity	Slow but significant deterioration	Low			
		Other ecosystem modifications	Slow but significant deterioration	Medium			
	Residential and commercial development	Tourism and recreation areas	No or imperceptible deterioration	Low			

Table 5 Target 10: Animal species listed as critically endangered on the Red List of threatened species in Zimbabwe

Animal species	Habitat	Range, population and population trend	Threats	Conservation actions	Conservation actions and research needed
Oreochromis mortimeri (Kariba bream)	• Wide range of water environments • Flourished in Lake Kariba and quiet waters of the large rivers until the introduction of *O. niloticus*	• Rapidly declining because of the introduction of *O. niloticus* • Has disappeared completely from parts of Lake Kariba	Invasive non-native and alien species (*O. niloticus*)	None	• Site and area protection and management • Habitat and natural process restoration • Reintroduction • Captive breeding and artificial propagation • Education, awareness and communications
Diceros bicornis (Black rhino)	• Shrub land and savanna • Protected in intensive protection zones in state-protected areas and private conservancies • Most are within private conservancies in the Lowveld	In intensive protection zones in State-protected areas and private conservancies	Poaching for the international rhino horn trade	• Zimbabwe rhino policy and management framework 2011–16 reviewed in 2018 but yet to be approved • Systematic monitoring, protection and law enforcement schemes • Listed on Appendix I of the CITES Appendices	• Trade management • Population trends monitoring • Better equipping and training of rangers
Africallagma cuneistigma (Chimanimani bluet, a montane damselfly)	Specific habitat details unknown	• Has been recorded from only two sites in the Chimanimani mountains • Population trend is unknown	• Illegal mining activities • Logging and wood harvesting resulting in deforestation • Alien invasive trees, and alien invasive fish such as trout	None	• Site and area management • Population size, distribution and trends research • Life history and ecology • Assess threats

Table 5 Target 10 (continued)

Animal species	Habitat	Range, population and population trend	Threats	Conservation actions	Conservation actions and research needed
Arthroleptis troglodytes (cave squeaker)	Sinkholes or caves, and open montane grassland	• A rare species known only from a single location – its type locality – in the western Chimanimani mountains • Discovered and recorded in 1962 and had been thought to be extinct but the species was seen in 2017	• Little direct information available for the species and threats to species are not well understood • Decline in area, extent and quality of habitat • Possible threats include artisanal mining and climate change	Recorded primarily in the protected Chimanimani National Park, but level and effectiveness of protection is unknown	• Research on species taxonomic status, distribution, population status and natural history • Surveys urgently needed to relocate species and determine population trends
Elattoneura lapidaria (rock threadtail)	Occurs along open and rocky streams between in the Chimanimani mountains	• Only known from the Chimanimani mountains • No information available on population size or trends	• Illegal gold mining • Pollution • Decline in area, extent and quality of habitat	Known locality is within the Chimanimani National Park, but no specific conservation action for species	• Monitoring of the montane habitat • Resource and habitat protection • Population size, distribution and trends research
Sarothrura ayresi (white-winged flufftail)	Montane grasslands and shrublands	• Migrant bird species recorded in Ethiopia, South Africa and Zimbabwe • Very small population undergoing rapid decline	• Agricultural activities • Gathering of plants • Fire • Mining • Human intrusion and disturbance • Pollution • Loss and degradation of preferred habitat, seasonal marshland	• CMS Appendix I and II • No specific national programme	• Site and area protection • Population size, distribution and trends research

Table 5 Target 17: The objectives of the Global Taxonomy Initiative (GTI), planned activities and Zimbabwe's implementation of the initiative

GTI operational objective	Planned activities	Progress by Zimbabwe in implementation
Assess taxonomic needs and capacities at national, regional and global levels for the implementation of the Convention on Biological Diversity	Country-based taxonomic needs assessments and identification of priorities	Comprehensive needs assessment, identification of priorities and capacity building required. Capacity is limited for most taxa but especially lacking for amphibians and invertebrates (mollusks, insects, spiders and worms), fungi, bacteria, viruses, algae and archaea
	Regional taxonomic needs assessments and identification of priorities	Regionally, there is a need for a taxonomic needs assessment, identification of priorities and capacity building
	Global taxonomic needs assessments	n/a
	Public awareness and education	Nationally, awareness and education are required, especially on less charismatic organisms and taxa
Provide focus to help build and maintain the human resources, systems and infrastructure needed to obtain, collate and curate the biological specimens that are the basis for taxonomic knowledge	• Global and regional capacity building to support access to and generation of taxonomic information • Strengthening of existing networks for regional cooperation in taxonomy	Zimbabwe is an associate member of the Global Biodiversity Information Facility (GBIF), an international network and research infrastructure, whose aim is to provide open access to data about all types of life on earth.[1] The GBIF has a capacity enhancement support programme which aims to address specific needs identified by GBIF participants to facilitate knowledge transfer and collaboration at regional and global levels. Another GBIF programme, Biodiversity Information for Development (BID), aims at increasing the amount of biodiversity information available in the African, Caribbean and Pacific group of states. BID supports capacity enhancement activities and projects to mobilize biodiversity data and strengthen national and regional biodiversity information facilities in these regions, and focuses on data that support policy needs in the region, particularly in connection with protected areas, threatened species and invasive alien species
Facilitate an improved and effective infrastructure and system for access to taxonomic information, with priority on ensuring countries of origin gain access to information concerning elements of their biodiversity	Develop a coordinated taxonomy information system	Information on flowering plants and ferns of Zimbabwe is available on the Flora of Zimbabwe website[2] as well as the Jstor Global Plants website.[3] Although not specifically for Zimbabwe, a number of other databases provide information on other organisms, including plants in Zimbabwe, notably *Encyclopedia of Life*,[4] BirdLife International[5] and the African vertebrate database.[6] The development of country-specific taxonomy information systems for vertebrates, invertebrates, fungi and other less studied taxa will enhance biodiversity knowledge in the country

[1] www.gbif.org/

[2] www.zimbabweflora.co.zw/

[3] https://plants.jstor.org/

[4] https://eol.org/

[5] www.birdlife.org/

[6] https://macroecology.ku.dk/resources/african-vertebrates/

Table 5 Target 17 (continued)

GTI operational objective	Planned activities	Progress by Zimbabwe in implementation
Within the major thematic work programmes of the CBD, include key taxonomic objectives to generate information needed for decision making in conservation and sustainable use of biological diversity and its components	Forest biological diversity	Zimbabwe's flora has been relatively well studied and described, with the National Herbarium and Botanic Garden mandated to conduct taxonomic research on the plants of Zimbabwe. The herbarium houses at least 500,000 dried plant specimens, with more than 3,000 types and at least 250 endemic or near-endemic plant species. Most of the information, except that which is on the Flora of Zimbabwe website, is not easily accessible as it is held in hard copies
	Dry and sub-humid lands biodiversity	No easily accessible information system
	Inland waters biological diversity	Information on fish biodiversity readily available on FishBase website.[7] There is no readily accessible taxonomic information for most of the other inland water organisms such as algae and zooplankton
	Agricultural biological diversity	No easily accessible information system
	Mountain biological diversity	Some information available on the Global Mountain Biodiversity Assessment website[8] as well as BirdLife International[9]
Within the work on cross-cutting issues of the Convention, include key taxonomic objectives to generate information needed for decision making in conservation and sustainable use of biological diversity and its components	Access and benefit sharing	Zimbabwe is party to the Nagoya Protocol on Access and Benefits Sharing, and there is a need to develop a taxonomic database on genetic resources under the protocol
	Invasive alien species (IAS)	Baseline taxonomic studies on IAS are required for clarity on the identity of some of the IAS that have been noted to occur in Zimbabwe. There is also a need to develop an easily accessible information system on IAS
	Support in implementation of Article 8 (j)	Article 8(j) of the Convention is on knowledge, innovations and practices of local and indigenous communities relevant to implementation of the Convention. Comprehensive taxonomic information on traditional knowledge on biodiversity is required for Zimbabwe, considering that a species may have different names in different localities
	Support for ecosystem approach and CBD work on assessment, including impact assessments, monitoring and indicators	Environmental impact assessments and monitoring surveys of biodiversity require taxonomic expertise, which in many cases is missing. There is therefore a need for capacity building in taxonomy in Zimbabwe for effective implementation of biodiversity-related programmes
	Protected areas	As in many countries, biodiversity conservation in protected areas of Zimbabwe is biased towards larger, better known species. This is partly due to lack of taxonomic expertise about most of the small species

[7] http://fishbase.org/

[8] www.mountainbiodiversity.org/

[9] http://datazone.birdlife.org

Table 6 Target 9: Management effectiveness assessment of Nyanga National Park

Methodology and year	Threats		Severity	Result	Overall threat score	Habitat condition score (state)	Conservation action (response) and result
Birdlife IBA (2011)	Agricultural expansion and intensification	Livestock farming and ranching, including forest grazing; smallholder grazing, ranching and farming	No or imperceptible deterioration	Low	High	Unfavourable	• Most of site (50-90%) designated as conservation area, including the most critical parts for important bird species • A comprehensive and appropriate management plan exists that aims to maintain or improve the populations of qualifying bird species • Substantive conservation measures are being implemented but are not comprehensive and are limited by resources and capacity • Medium-level conservation response
	Biological resource use	Gathering terrestrial plants – unintentional effects (species being assessed is not the target)	Slow but significant deterioration	Medium			
		Hunting and collecting terrestrial animals – unintentional effects (species is not the target)	Slow but significant deterioration	Low			
	Invasive and other problematic species and genes	Invasive non-native and alien species: *Acacia mearnsii* (black wattle)	Moderate to rapid deterioration	High			
	Natural system modifications	Fire and fire suppression; increase in fire frequency and intensity	Moderate to rapid deterioration	High			

Table 6 Target 10: Animal species in Zimbabwe listed as endangered on the IUCN Red List

Species	Population trend					Threats									Conservation actions				
	Unknown	Unspecified	Decreasing	Stable	Increasing	Habitat loss	Agriculture	HWC and settlements	Deforestation	Pollution	IAS	Harvesting	Poaching	Climate change	Species specific plan	Systematic monitoring	Education and awareness	Occurs in PA	CITES Listing
Cycloderma frenatum (Zambezi flapshell turtle)			■							■		■						■	
Streptocephalus zuluensis		■																■	
Lycaon pictus (African wild dog)			■			■	■	■			■			■	■	■	■	■	■
Probreviceps rhodesianus (forest rain frog)			■			■	■											■	
Amietia inyangae (Nyanga river frog)			■				■				■							■	
Platycypha inyangae (Nyanga jewel)	■																	■	
Pseudagrion vumbaense (Vumba sprite)	■								■		■							■	
Balearica regulorum (grey crowned crane)			■			■	■			■		■	■			■	■	■	II
Ardeola idea (Madagascar pond heron)																			
Mertensophryne anotis (Chirinda toad)			■				■	■	■									■	
Aquila nipalensis (steppe eagle)			■															■	II**
Gyps coprotheres (Cape vulture)			■			■	■	■			■	■		■		■	■	■	II
Neophron percnopterus (Egyptian vulture)			■				■	■		■	■						■	■	II*
Torgos tracheliotos (lappet-faced vulture)			■				■			■		■	■			■	■	■	II

* CMS Appendix I; ** CMS Appendix II

Table 7 Target 9: Management effectiveness assessment of Stapleford Forest

Methodology and year	Threats		Severity	Result	Overall threat score	Habitat condition score (state)	Conservation action (response) and result
Birdlife IBA (2011)	Agricultural expansion and intensification	Wood and pulp plantations, including afforestation, and agro-industry plantations	Slow but significant deterioration	High	High	Unfavourable	• Whole area of site (>90%) covered by appropriate conservation designation • A management plan exists but it is out of date or not comprehensive • Some limited conservation initiatives are in place • Medium-level conservation response
	Biological resource use	Logging and wood harvesting; unintentional effects – large scale	Slow but significant deterioration	Medium			
	Human intrusions and disturbance	Work and other activities	Moderate to rapid deterioration	High			
	Pollution	Excessive energy and noise pollution	Slow but significant deterioration	Medium			

Table 7 Target 10: Animal species in Zimbabwe listed as vulnerable on the IUCN Red List

Species	Population trend					Threats											Conservation Actions				
	Unknown	Unspecified	Decreasing	Stable	Increasing	Habitat loss	Agriculture	HWC	HIS	Deforestation	Pollution	IAS	Harvesting	Poaching	Mining	Fire	Climate change	Species specific plan	Systematic monitoring	Education and	Occurs in Protected	CITES Listing
Loxodonta africana (African elephant)					■	■	■	■	■	■				■		■	■	■	■	■	■	II
Malacochersus tornieri (softshell		■																				II
Lycophidion nanus (dwarf wolf snake)	■					■	■		■	■											■	
Platysaurus imperator (imperial flat lizard)	■												■									
Tetramorium microgyna		■																				
Oreochromis andersonii (three-			■									■	■								■	
Oreochromis macrochir (greenhead	■											■										
Vandijkophrynus inyangae (Nyanga				■								■									■	
Strongylopus rhodesianus (Chimanimani stream frog)			■				■		■	■		■			■						■	
Hippopotamus amphibious (hippo)																						
Carpitalpa arendsi (Arend's golden mole)	■					■	■		■	■						■					■	
Smutsia temminckii (Temminck's ground pangolin)			■			■							■	■			■			■	■	II
Rhampholeon marshalli (Marshall's pygmy chameleon)			■			■	■			■											■	
Hyperolius inyangae (Nyanga long reed frog)	■					■	■		■												■	
Acinonyx jubatus (cheetah)			■			■	■	■	■			■						■	■	■	■	I
Felis nigripes (black-footed cat)			■			■	■					■	■				■					■
Bucorvus leadbeateri (southern ground hornbill)			■			■	■	■		■	■	■				■	■			■	■	

Table 7 Target 10 (continued)

Animal species	Population trend					Threats											Conservation actions				
	Unknown	Unspecified	Decreasing	Stable	Increasing	Habitat loss	Agriculture	HWC	HIS	Deforestation	Pollution	IAS	Harvesting	Poaching	Mining	Fire	Climate change	Species specific plan	Systematic monitoring	Education and awareness	Occurs in Protected Area	CITES Listing
Agapornis nigrigenis (black-cheeked lovebird)			■			■	■										■					II
Bugeranus carunculatus (wattled crane)			■			■	■		■		■	■			■	■	■	■	■	■	■	II
Sagittarius serpentarius (secretary bird)			■			■	■		■				■			■	■					II
Falco fasciinucha (taita falcon)			■						■		■	■									■	II
Egretta vinaceigula (slaty egret)			■			■	■				■										■	■
Swynnertonia swynnertoni (Swynnerton's robin)			■			■	■			■		■			■	■	■				■	
Hirundo atrocaerulea (blue swallow)			■			■	■		■						■	■		■			■	I & II
Panthera pardus (Leopard)			■	■		■	■	■	■				■		■	■			■	■	■	■
Giraffa camelopardalis (giraffe)					■	■				■						■					■	
Polemaetus bellicosus (martial eagle)			■			■	■				■										■	
Panthera leo (lion)					■	■	■	■	■					■				■	■	■	■	II
Acrophymus rossi (Manyika agile grasshopper)			■			■	■			■												
Anthropoides paradiseus (blue crane)	■																					II
Oxyura maccoa (maccoa cuck)			■								■										■	
Falco concolor (sooty falcon)			■				■		■		■											

Table 8 Target 9: Management effectiveness assessment of the Mosi oa Tunya/Victoria Falls World Heritage Site

Methodology and year	Threats	Threat level		Overall threats	Current state and trend	Overall protection and management	Conservation outlook
WHA Outlook Report (2017)	**Current Threats**						
	Fire and fire suppression	DD		High	• Low concern • Stable trend	• Some concern • Protection and management programmes are severely constrained by budget and staffing limitations • Implementation of protection measures has been weak and haphazard, with poor co-ordination between Zambia and Zimbabwe and relevant agencies • Limited influence by site management authorities over threats from outside the site (leakage of municipal sewage into the property, unplanned urban development close to the boundaries, and the road and railway corridor through the site)	Good, with some concerns
	Droughts	DD					
	Livestock farming and grazing	DD					
	Housing, urban areas	High					
	Tourism, visitors and recreation	Low					
	Roads and railroads	Low					
	Commercial and industrial areas	High					
	Dams and water management or use	High					
	Other activities	Low					
	Household sewage and urban waste water	Low					
	Poaching	DD					
	Invasive non-native or alien species	High					
	Housing and urban areas	DD	Low				
	Potential threats						
	Tourism, visitors and recreation	High					
	Dams and water management or use	Low					
	Dams and water management or use	DD	High				

Table 9 Target 9: Management effectiveness assessment of the Mana Pools National Park, Sapi and Chewore safari areas World Heritage Site

Methodology and year	Threats	Threat level		Overall threats	Current state and trend	Overall protection and management	Conservation outlook
WHA Outlook Report (2017)	**Current threats**						
	Invasive, non-native and alien species (water hyacinth in the Zambezi River and the old channels that make up the four Mana pools)	Low		High	Low concern Stable trend	• Some concern • Lack of effective monitoring and so there is little information available on the state of the site's values • Need for increased vigilance to ensure greater trans-boundary cooperation in the design and siting of tourism infrastructure • Need to monitor, evaluate and mitigate the effects of possible future mining activities as well as to mitigate poaching and other illegal activities	Significant concern
	Poaching	High					
	Fishing and harvesting aquatic resources	Low					
	Tourism, visitors and recreation (escorted walking, canoeing, vehicle traffic and operator game drives)	Low					
	Tourism and recreation areas (tourism infrastructure developments)	High					
	Dams and water management or use	DD*					
	Hunting (commercial and subsistence)	Low	Low				
	Potential threats						
	Agricultural development	Low					
	Dams and water management or use	Low					
	Hunting (commercial and subsistence)	Low					
	Oil and gas exploration and development	High	High				