

**BACKGROUND  
DOCUMENT**

# The BES-Net Regional Triologue for East and Southern Africa

Advancing Inclusive Solutions for Invasive Alien Species and Sustainable Use of Wildlife

 18-20 February 2025

 Windhoek, Namibia



**The United Nations Development Programme (UNDP)** is a global network within the United Nations system dedicated to achieving the Sustainable Development Goals. With a presence in nearly 170 countries and territories, UNDP works to eradicate poverty, reduce inequalities and exclusion, and strengthen democratic governance. UNDP advocates change by connecting countries with the knowledge, experience and resources needed to improve the lives of their people. The organization assists countries in developing policies, acquiring leadership skills, forming partnerships and strengthening institutional capacities and resilience. Across all its activities, UNDP promotes the protection of human rights and fosters the active participation of women to support development outcomes and find sustainable solutions to national and global challenges.

**UNDP's Nature Hub** is an ambitious and forward-looking response to the current crisis of global biodiversity loss. By mobilizing partners and accelerating action to achieve the targets of the Global Biodiversity Framework by 2030, the Nature Hub places nature at the centre of sustainable development efforts. With its extensive portfolio of projects and its convening power, UNDP collaborates with governments and communities worldwide to promote a more sustainable and equitable future.

**The Biodiversity and Ecosystem Services Network (BES-Net)** is a flagship initiative of the Nature Hub. Recognizing that the natural world is a vital support system for our societies and economies, BES-Net aims to protect biodiversity and strengthen ecosystem resilience by facilitating dialogue between science, policy and practice. Through its efforts, BES-Net contributes to placing nature at the heart of development, supporting solutions that work for both people and the planet.

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*Water hyacinth (Eichhornia crassipes) in Lake Victoria*

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# 1. KEY MESSAGES

Biodiversity, the foundation of life on Earth, provides essential resources like food, water, and raw materials, yet it faces significant threats. Invasive alien species (IAS) and unsustainable practices undermine this vital support system, jeopardizing livelihoods, cultures, and the natural resilience we rely on. Global changes in land and sea use, climate change, pollution, and illegal trade in wild species also drive biodiversity loss, with serious implications for human health and economic stability. Biological invasions are particularly harmful, causing significant, sometimes irreversible, changes to ecosystems and contributing to species extinction. Of the 37,000 alien species introduced by humans, over 3,500 are invasive alien species which pose serious risks to nature, economies, food security, and human health, demonstrating the urgency of addressing IAS to protect both biodiversity and human well-being<sup>1</sup>. Unfortunately, the introduction of new alien species is rising at a rate of approximately 200 per year and the threats posed by IAS are escalating across all regions. If not addressed, impacts of IAS often continue long after their initial introduction, causing persistent and sometimes irreversible damage to ecosystems.

## Why Invasive Alien Species (IAS) Management Matters

Invasive species are one of the five major drivers of biodiversity loss globally, alongside land and sea-use changes, direct exploitation of organisms, climate change, and pollution. They are a threat to global biodiversity in general, particularly at local scale, and driver of biodiversity loss especially in fragile ecosystems (Roy *et al.*, 2023). By effectively managing IAS, we help protect native ecosystems that are vital to East and Southern Africa's rich natural heritage.



<sup>1</sup> (Roy et al., 2023)



- Left unchecked, IAS can cause major economic losses. For instance, in 2019, the global economic cost of IAS was estimated to be over US\$ 423 billion, with this cost quadrupling every decade since 1970 (Roy *et al.*, 2023). Proactive measures like biosecurity and eradication programs protect key industries, such as agriculture and fisheries, that communities depend on for their livelihoods.
- Invasive species disrupt food systems and water resources. In addition to invasive plants disrupting irrigation and fishing process for example, the invasive Nile perch (*Lates niloticus*) has altered aquatic ecosystems, threatening fisheries and the livelihoods of communities dependent on them.
- Invasive alien species (IAS) threaten Indigenous Peoples and local communities by disrupting traditional ways of life, eroding cultural practices, and making it harder to pass down knowledge. Since these communities rely on nature for their livelihoods and identity, IAS can weaken their independence and connection to their lands.
- Some IAS like *Parthenium hysterophorus* (commonly known as famine weed or Santa-Maria) reduce carbon storage and interfere with essential processes like pollination and soil health, which degrade ecosystems and generally hamper efforts to mitigate climate change impacts (Agha et al., 2020). Effective strategies, like restoring ecosystems and adopting management practices, help reduce these negative impacts. Consequently, controlling IAS ensures vital ecosystems services are maintained.
- Invasive alien species displace food for wild animals, driving them to community land. This increases conflicts between communities adjacent to conservation and protected areas and with the protect area management authorities.
- Early detection and clear communication are crucial for addressing risks associated with IAS establishment, helping protect public health. For instance, clear communication of prevention, control, and management methods for certain IAS, like invasive mosquitoes, can help prevent diseases such as malaria and dengue, ultimately saving both human lives and costs.
- Many communities that rely on natural resources for their income and daily needs benefit from reduced IAS impacts. By understanding the threats posed by IAS, communities can adopt proactive strategies, such as early detection and control measures, that mitigate their effects. This knowledge empowers communities to protect their resources, which in turn helps strengthen long-term economic resilience and well-being.
- Preventing IAS from spreading is far more cost-effective than managing them once they become established. Effective prevention requires widespread public awareness alongside scientific knowledge of IAS, including their behaviour, habitat preferences, and early warning signs. A well-developed and implemented public awareness strategy can enhance risk assessments and early detection efforts, helping to identify potential threats before they spread. This, in turn, minimizes the long-term environmental, economic, and social costs of management and restoration.
- While invasive alien species (IAS) often pose ecological challenges, some can offer benefits when managed appropriately. In South Africa, certain invasive alien plants have been found to possess insecticidal properties, offering potential as natural pesticides in agriculture. Utilizing these plants could reduce reliance on synthetic chemicals, lowering costs for smallholder farmers and promoting sustainable pest management practices (Uyi et al.,





2021). Additionally, in Kenya, initiatives have been developed to convert the invasive water hyacinth into biodegradable packaging materials, providing economic opportunities while addressing environmental concerns (Nega et al., 2022; Sierra-Carmona et al., 2022). By adopting innovative management approaches, countries and communities can transform IAS challenges into sustainable economic and ecological opportunities.

### Why Sustainable Use of Wild Species Matters

- As shown in **Figure 1.3**, approximately 50,000 wild species are used for food, energy, medicine, materials, and other purposes through fishing (7,500 species), gathering (31,100 species of wild plants and 1,500 species of mushrooms), forestry (7,400 species of trees), and the harvest of terrestrial animals (1,700 species of terrestrial wild invertebrates and 7,500 species of amphibians, reptiles, birds, and mammals) worldwide (Fromentin et al., 2022; Priyadarshini & Bundela, 2023).
- Biodiversity provides essential resources like food, water, and materials that 1 in 5 people rely on for income and food, while 2.4 billion depend on wood fuel (Fromentin *et al.*, 2022). In 2018, wildlife tourism contributed about US\$ 120 billion to the global GDP (World Travel & Tourism Council, 2019), with significant economic benefits in East and Southern Africa.
- Using resources sustainably keeps ecosystems healthy, supporting essential processes like soil renewal and habitat creation. This helps nature adapt to challenges like climate change, protecting biodiversity and human well-being, making life more resilient for all. Additionally, it supports key Sustainable Development Goals (SDGs), such as ending poverty (SDG 1), eradicating hunger (SDG 2), and ensuring clean water (SDG 6). When people and ecosystems thrive together, everyone benefits.
- Unsustainable use of plants and animals threatens the survival of 1 million species and the livelihoods of billions of people. Sustainable management of wild species ensures agriculture thrives, water systems function, and communities remain resilient to climate impacts.
- For many Indigenous Peoples and local communities, biodiversity isn't just nature, it's part of their identity and traditions. Sustainable use of wild species safeguards these ties, preserving cultural heritage for future generations.
- Biodiverse ecosystems act as carbon sinks and regulate water cycles. Sustainable practices in forestry and agriculture strengthen the resilience of these ecosystems to climate variability.



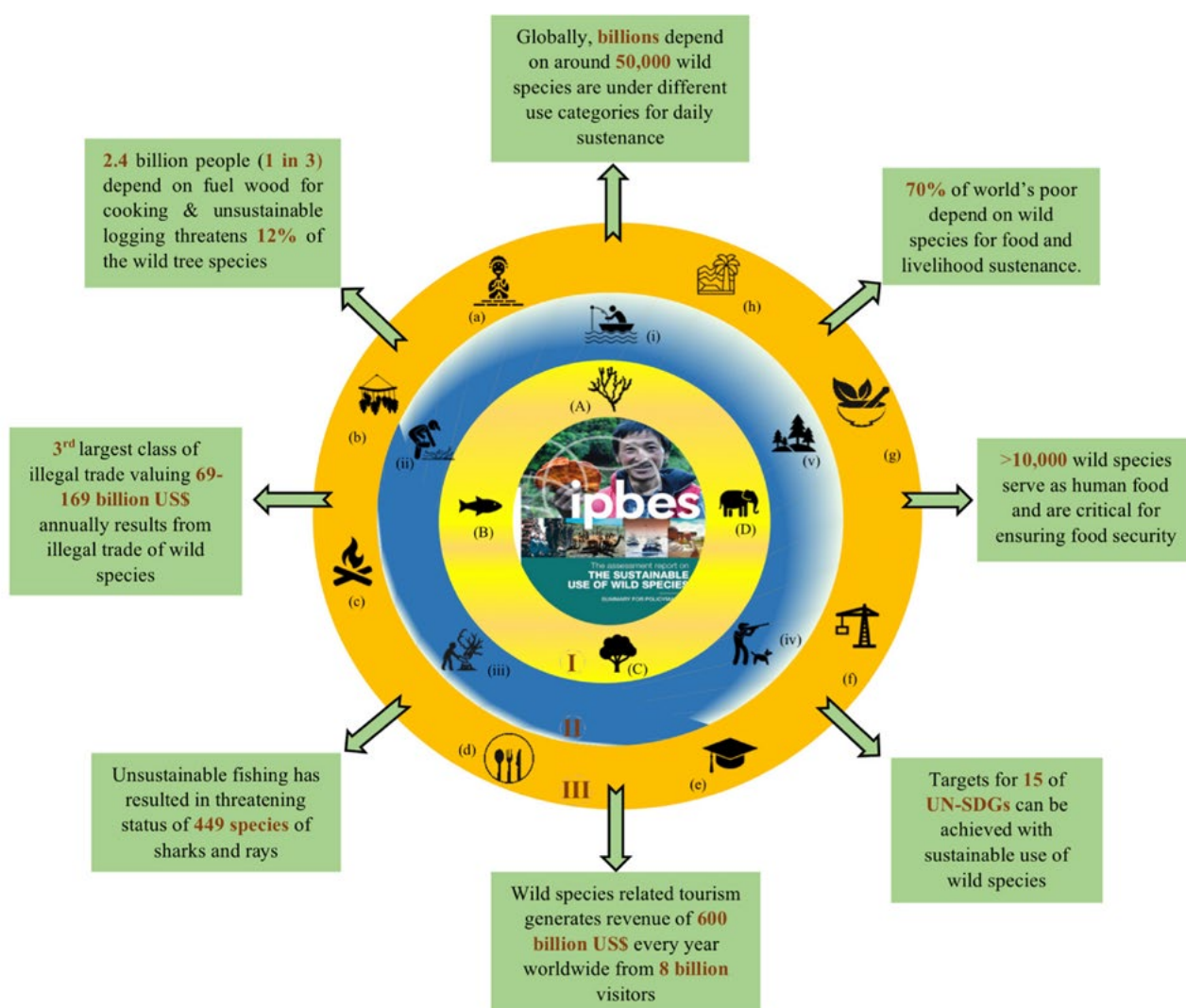


Figure 1: Summary of the IPBES Assessment report on the sustainable use of wild species: The innermost circle (Circle I) represents the broad categories of wild species: (A) plants (excluding trees), (B) fungi, and algae; aquatic animals; (C) trees; and (D) terrestrial animals. Circle II highlights the various practices responsible for the use of these wild species, distinguishing between extractive practices, such as (i) fishing, (ii) gathering, (iii) logging, (iv) terrestrial animal harvesting, (v) non-extractive practices. Circle III provides specific examples of how wild species are utilized, including for (a) religion, (b) aesthetics, (c) energy, (d) food/feed, (e) learning and education, (f) construction and infrastructure, (g) medicine, and (h) recreational activities. Lastly, the boxes surrounding the circles offer key conclusions from the report, summarizing the most important findings related to the sustainable use of wild species. Source; (Priyadarshini & Bundela, 2023)





## How IAS and Sustainable Use of Wild Species (SU) are Connected

Invasive Alien Species (IAS) significantly undermine sustainable use of wild species by damaging ecosystems, reducing biodiversity, and impairing vital services. For instance, IAS like water hyacinth (*Eichhornia crassipes*) in Lake Victoria obstruct waterways and harm fisheries, while the fall armyworm disrupts agriculture and food security in Southern Africa. These challenges highlight the need for integrated, cross-sectoral approaches to prevent IAS introductions, control their spread, and restore affected ecosystems. Collaboration across sectors and borders is crucial to ensuring the long-term sustainability of resources, benefiting both communities and ecosystems.

### Integrated Strategies for SU and IAS Management

The IPBES assessments emphasize the need for integrated management strategies that address both IAS and the sustainable use of biodiversity. These strategies include: (i) Regional cooperation to tackle IAS across borders, (ii) Indigenous and local community engagement and mainstreaming their traditional knowledge, innovations and local management systems, and (iii) proactive measures like early detection and biosecurity programs to prevent IAS from spreading. By combining efforts to manage IAS with practices that promote sustainable use of wild species, we can help protect biodiversity, support livelihoods, and ensure that ecosystems remain healthy for current and future generations.

## Nexus Assessment: Interlinkages Between Biodiversity, Water, Food, and Health

The latest assessment from IPBES (2024), Nexus assessment<sup>2</sup> (nexus is defined as ‘*the interlinkages among two or more elements, sectors or systems*’), explores how biodiversity, water, food, health, and climate change are all closely connected, highlighting the challenges we face in each area. It examines how the loss of biodiversity, water scarcity, food insecurity, health risks, and climate change are all linked, offering a clearer understanding of these issues and the need for integrated solutions. The Nexus assessment looks at the evidence to show how these different elements impact each other and emphasizes the importance of working together to tackle these challenges.

Nexus approaches, defined as ‘*understanding the interlinkages and interdependencies between sectors and systems in a holistic manner to develop integrated and adaptive decisions that aim to maximize synergies and minimize trade-offs*’, are vital because the challenges facing biodiversity, water, food, health, and climate are all interconnected, with issues in one area often affecting others across different locations and timeframes. However, decisions to tackle these problems are often made in isolation, which can lead to mismatches, unplanned trade-offs, and unintended consequences. By understanding these connections better and fostering collaboration across sectors and stakeholders, the nexus assessment can guide more effective and coordinated solutions.

<sup>2</sup> Nexus Assessment Summary for Policy makers is available on this link: <https://zenodo.org/records/13850290>



# 1. INTRODUCTION

The East and Southern Africa Regional Trialogue, taking place from 18th to 20th February 2025 in Windhoek, Namibia, will convene stakeholders to address two interconnected challenges: invasive alien species (IAS) and sustainable use of wild species (SU), guided by the findings of two IPBES assessment reports; the [Thematic Assessment on the Sustainable Use of Wild Species](#)<sup>3</sup> and the [Thematic Assessment on Invasive Alien Species](#)<sup>4</sup>. These challenges affect biodiversity, ecosystems, and livelihoods across the region. The Trialogue fosters collaboration among policymakers, scientists, practitioners, and Indigenous and traditional knowledge holders to tailor global biodiversity insights to regional realities, ensuring practical, impactful outcomes. Ecosystems in East and Southern Africa are integral to local economies, cultural traditions, and food security, necessitating their protection and sustainable management to ensure the well-being of communities and the resilience of biodiversity in the face of emerging challenges such as climate change, bio-invasions and resource overexploitation.

## 1.1 Positioning of the Trialogue and IPBES Assessment Themes within the Framework of the KMGBF

The Biodiversity and Ecosystem Services Network (BES-Net) Trialogues serve as a collaborative platform that brings together scientists, policymakers, and practitioners to address critical biodiversity issues. These Trialogues are informed by the thematic assessments of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), ensuring that discussions are grounded in the latest scientific findings<sup>5</sup>. [The Global Biodiversity Framework](#) (KMGBF) outlines international goals and targets for biodiversity conservation and sustainable use of wild species. By aligning the focus of BES-Net Trialogues with IPBES assessment themes, stakeholders can effectively translate global biodiversity targets into actionable strategies at national and regional levels. This alignment facilitates the integration of scientific, Indigenous and local knowledge into policy and practice, promoting cohesive efforts toward achieving the objectives set forth in the KMGBF<sup>6</sup>.

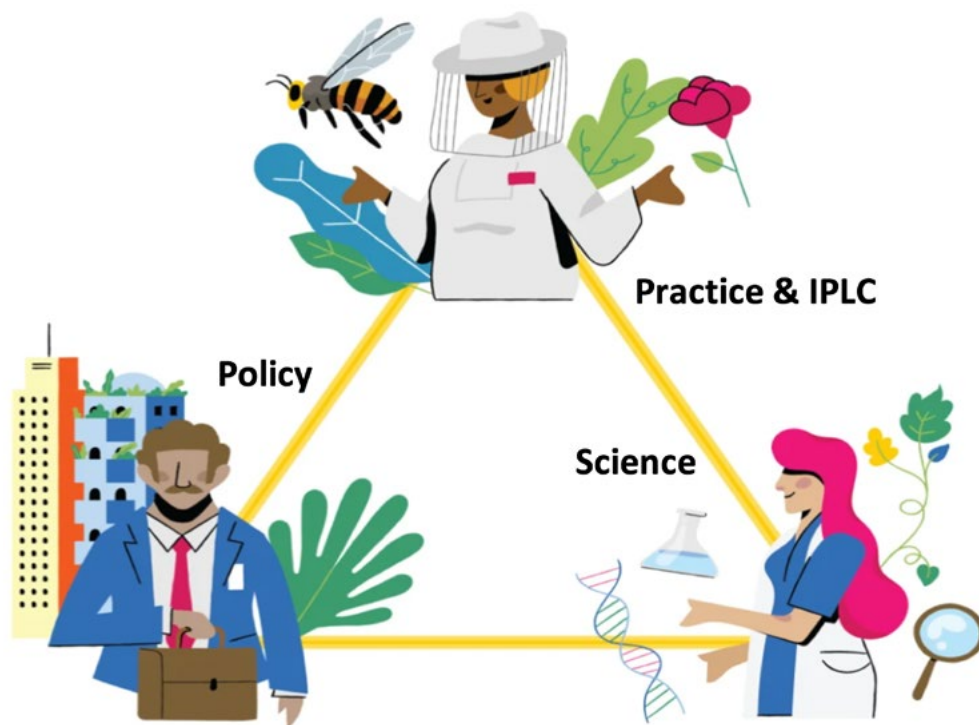
3 (Fromentin et al., 2022)

4 (Roy et al., 2023)

5 BES-NET'S TRIALOGUE APPROACH: TRANSFORMING GLOBAL KNOWLEDGE INTO LOCAL ACTION [https://www.besnet.world/wp-content/uploads/2024/12/IPBES-11-Poster\\_BES-Net-UNDP\\_Global-Knowledge-Local-Action-1.pdf?utm](https://www.besnet.world/wp-content/uploads/2024/12/IPBES-11-Poster_BES-Net-UNDP_Global-Knowledge-Local-Action-1.pdf?utm)

6 BES-NET's Journey to a Sustainable Future for all: Connecting Knowledge to Action for Biodiversity and Ecosystem Services: [https://files.ipbes.net/ipbes-web-prod-public-files/webform/stakeholder\\_days\\_virtual\\_posters/70166/view-file.pdf?utm](https://files.ipbes.net/ipbes-web-prod-public-files/webform/stakeholder_days_virtual_posters/70166/view-file.pdf?utm)





*Figure 2: BES-Net Trialogues bring together experts from science, policy, and practice, including Indigenous and traditional knowledge holders, to share knowledge and explore actionable pathways for addressing pressing issues in biodiversity conservation*

Specific to the East and southern Africa Regional Trialogue, the IAS and SU themes are integral components within the KMGBF. These themes originate from concerns raised by Convention on Biological Diversity (CBD) member states during the era of the [Aichi Biodiversity Targets](#), specifically Target 9, which aimed to identify and prioritize invasive alien species and manage pathways to prevent their introduction and establishment by 2020 (**See Table 1 on page 16**).

The goal is to translate global insights into actionable strategies tailored to the specific needs and realities of East and Southern Africa.

Key topics for discussion include:

- Developing strategies to mitigate the impacts of Invasive Alien Species (IAS) on biodiversity, ecosystems, and livelihoods.
- Identifying pathways to balance resource use with conservation in the sustainable use of wild species (SU).
- Promoting inclusive decision-making by fostering collaboration among policymakers, scientists, practitioners, Indigenous Peoples and local communities (IPLCs), and private sector actors to co-create equitable, regionally adapted biodiversity solutions.





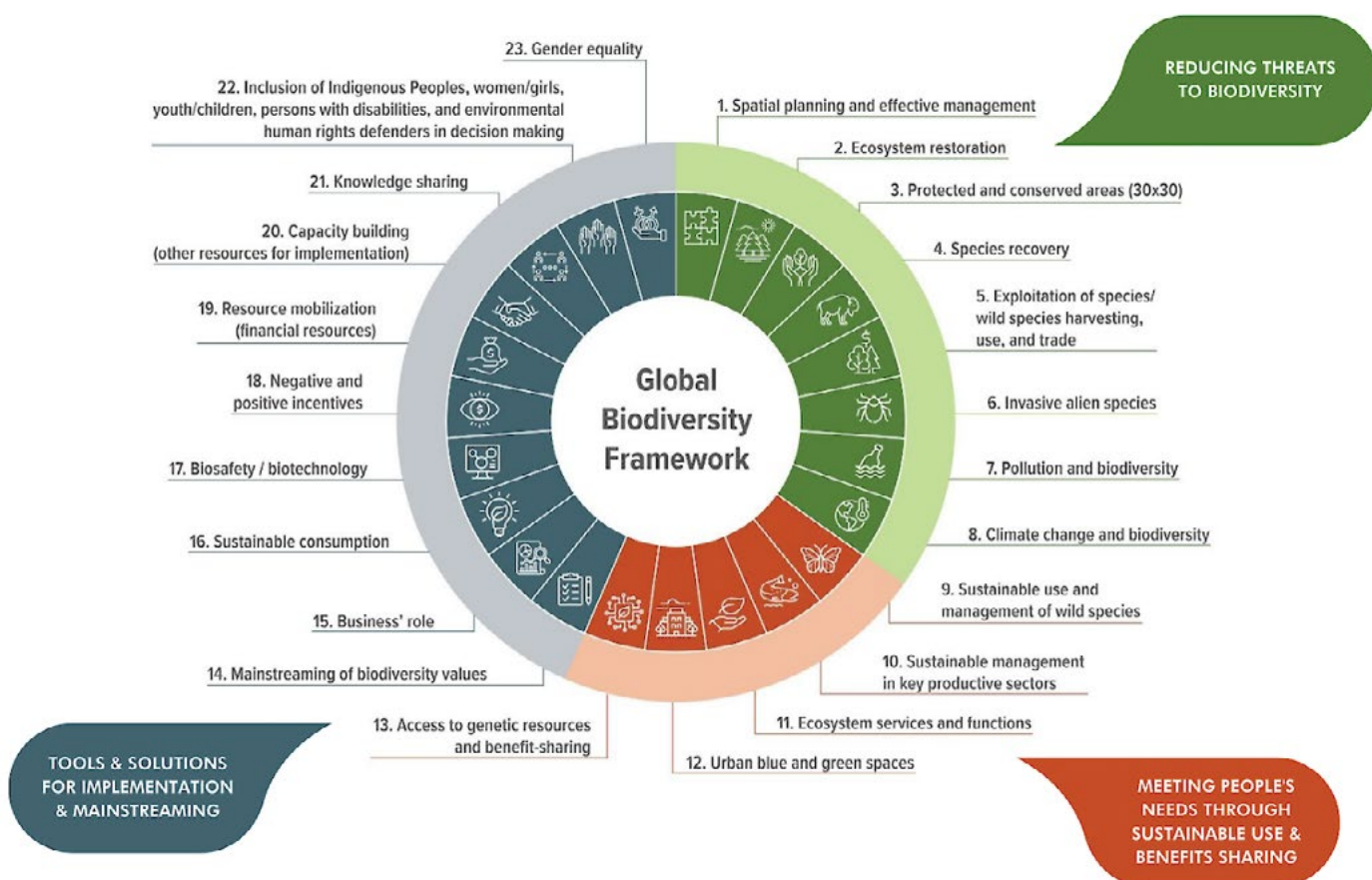
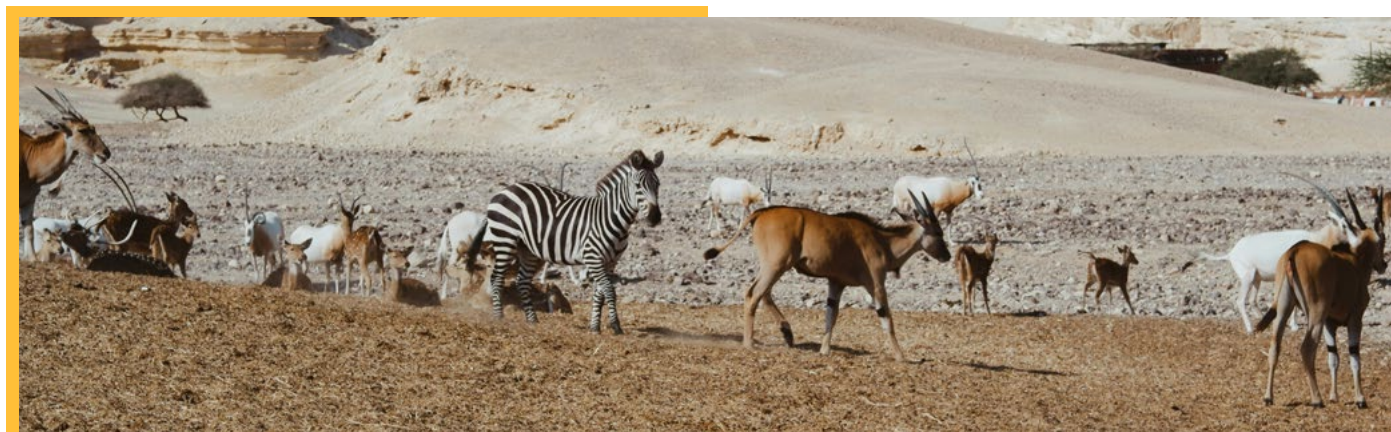


Figure 3: Overview of the 23 Targets of the Kunming-Montreal Global Biodiversity Framework (KMGBF)

This background document synthesizes regional challenges, opportunities, and policy recommendations, drawing on insights from national biodiversity strategies and action plans (NBSAPs) and national ecosystem assessments (NEAs) from six focus countries: Botswana, Malawi, Namibia, Uganda, Tanzania, and Zimbabwe. As shown in **Table 1**, these countries are CBD member states and have existing commitments to IAS and SU issues that align with the KMGBF targets (**See figure 3**), reinforcing their obligations under the CBD framework, aimed at promoting cohesive and effective biodiversity conservation efforts.



**National ecosystem assessments (NEAs)** are country-led processes that evaluate biodiversity, ecosystem services, and their links to people. Tailored to national needs, they assess the status, trends, drivers of change, and policy effectiveness. NEAs integrate diverse knowledge systems to support informed decision-making and emphasize the value of nature in policies. The process includes scoping, evaluation, approval, and applying findings to guide sustainable development.

Source: [NEAI](#)

**National Biodiversity Strategies and Action Plans (NBSAPs)** are country-specific frameworks for implementing the Convention on Biological Diversity (CBD). They set national targets, integrate biodiversity into sectors like agriculture and forestry, and align with global goals such as the Kunming-Montreal Framework, ensuring strategic action to protect and restore biodiversity.

Source: [CBD](#)

*Table 1: National Commitments of Trialogue Countries to KMGBF Targets 6 and 9. This table outlines the specific commitments made by Trialogue countries in their national biodiversity strategies and action plans?: Botswana, Malawi, Namibia, Tanzania, Uganda, and Zimbabwe, towards achieving Target 6 (reducing the introduction and impact of invasive alien species) and Target 9 (sustainable management and use of wild species) of the Kunming-Montreal Global Biodiversity Framework (KMGBF).*

Country	KMGBF T06: Reduce the introduction of IAS by 50% and mitigate their impacts on BES	KMGBF-T09: Manage wild species sustainably to benefit people
Botswana	By 2030, ensure that the rates of introduction and establishment of invasive alien species is reduced by at least 50%, mitigate the impacts of the invasive alien species on biodiversity and ecosystem functions and services especially in priority sites.	By 2030, all terrestrial and inland water species are sustainably used and effectively managed to provide social, economic and environmental benefits for all people especially those most dependent on biodiversity and in vulnerable situations, while encouraging customary sustainable use of wild species by local communities.
Malawi	Prevent new invasions, establishment of priority Invasive Alien Species and reduce the current impacts of Invasive Alien Species in protected areas and priority sites by 2035.	By 2035, wild species are sustainably utilized and managed providing social, economic, and environmental benefits for people, especially those in vulnerable situations whose livelihoods are mostly dependent on biodiversity through sustainable biodiversity-based activities and encouraging customary sustainable use of wild species by local communities.
Namibia	While Namibia has committed to the KMGBF and its targets, specific national commitments or strategies to achieve Targets 6 and 9 are not yet publicly detailed.	





Tanzania	<p>Reduce the rates of introduction of invasive alien species by 50% and minimize their impact on biodiversity and ecosystem functions and services by 2030:</p> <ul style="list-style-type: none"> <li>• Strengthen monitoring programmes and reporting for IAS</li> <li>• Identify and capacitate agencies responsible for enforcement of regulatory instruments on including importation and movement of live materials</li> <li>• Promote application of Integrated Pest Management (IPM) to control invasive alien species</li> <li>• Promote national, regional and international cooperation and agreements on control of IAS</li> <li>• Promote information dissemination, public awareness, extension services and management of IAS</li> <li>• Identify and manage priority pathways and vectors of IS introduction and spread</li> <li>• Promote research, and develop and strengthen a national IS database</li> </ul>
Uganda	<p>By 2030, invasive alien species harmful to biodiversity, socio-economic transformation and human health are managed</p> <p>By 2030, at least 2 partnerships established to ensure that wild harvested flora and fauna-based products are sourced sustainably</p>



**Zimbabwe**

Assess, eliminate, minimize, reduce and mitigate the impacts of invasive alien species on biodiversity and ecosystem services by identifying and managing pathways of introduction of alien species, preventing the introduction and establishment of priority invasive alien species, reducing the rates of introduction and establishment of other known or potential invasive alien species by at least 50 per cent, by 2030, eradicating or controlling invasive alien species especially in priority sites.

Ensure that the management and use of wild species are sustainable, thereby providing socio-cultural, economic and environmental benefits for people, especially those in vulnerable situations and those most dependent on biodiversity, including through ecosystem-based approaches and sustainable biodiversity-based activities, products and services that enhance biodiversity, and protecting and encouraging customary sustainable use of wild species by indigenous peoples and local communities.

By aligning global frameworks with regional realities, the Trialogue seeks to strengthen sustainable livelihoods, enhance cross-border collaboration, and safeguard biodiversity. The following tables provide an overview of how these challenges and opportunities manifest across the focus countries, offering a foundation for targeted discussions and tangible outcomes.

*Table 2: This table outlines key challenges, trends and opportunities for Sustainable Use of Wild Species (SU) in the six focus countries of East and Southern Africa. These insights draw on regional trends and highlight potential pathways for promoting sustainability while addressing pressing biodiversity concerns. The data was compiled through interviews with stakeholders, contributions from UN Volunteers (UNVs), and relevant literature and policy documents.*

Country	Key Challenges	Trends	Opportunities
<b>Botswana</b>	Heightened exploitation of wildlife, like poaching for ivory and hunting for consumption; Habitat loss from land use changes; Effects of climate change on ecosystems.	Increasing community involvement in conservation; Rising demand for eco-friendly tourism.	Robust environmental stewardship and policies; Opportunities for wildlife-based tourism; Strengthen customary governance and use of Indigenous knowledge to guide sustainable practices.
<b>Malawi</b>	Overfishing; Deforestation and soil loss; Climate change that disrupt agriculture and natural resources.	Declining fish stocks; Increasing population pressures on land use; Increased focus on community-led resource management and reforestation initiatives.	Opportunities for sustainable fisheries management; Ecotourism potential; Traditional ecological knowledge for managing resources sustainably. Strengthened community bylaws and customary governance



<b>Namibia</b>	Overuse of marine resources; Land degradation and desertification; Climate impacts on water and wildlife.	Expanding marine conservation programs; Strong communal wildlife conservancies; Growth in wildlife-based tourism industries.	Community-led resource management programs; Leveraging biodiversity for tourism; Innovative marine systems management.
<b>Uganda</b>	Deforestation and land degradation; Illegal wildlife trade; Climate impacts on farming and water.	Rising interest in sustainable forestry; Efforts to combat wildlife trafficking gaining momentum.	Explore sustainable forestry and ecotourism possibilities; Leverage traditional knowledge for smart resource use.
<b>Tanzania</b>	Overfishing and deforestation; Illegal wildlife trade; Habitat destruction; Climate change.	Increasing reliance on community-based conservation; Growth in ecotourism-driven economic initiatives.	Diverse ecosystems and wildlife hence high potential for sustainable tourism; Community-driven conservation programs. Inclusion of Indigenous and local knowledge (ILK) for resource management.
<b>Zimbabwe</b>	Overuse of wildlife and forests; Soil degradation; Illegal wildlife trade; Climate stress on farming and water resources.	Strengthening of wildlife conservation laws; Increasing use of Indigenous knowledge in resource planning.	Robust conservation laws and institutions; Wildlife tourism opportunities; Indigenous knowledge for managing resources wisely.



*Table 3: This table highlights the key challenges and opportunities related to Invasive Alien Species (IAS) in the six focus countries of East and Southern Africa. While the IPBES Invasive Alien Species Assessment offers a comprehensive global perspective, country-level data and impacts often reflect specific regional trends and patterns. By examining these challenges and opportunities, the table provides a foundation for discussing actionable policy options and collaborative strategies during the Trialogue. The data was compiled through interviews with stakeholders, contributions from UN Volunteers (UNVs), and relevant literature and policy documents.*

Country	Key Challenges	Trends	Opportunities
Botswana	Spread of invasive plants in water bodies and rangelands; Potential invasion by alien animals, such as rodents and reptiles.	Growing focus on water resource protection and ecosystem health in response to plant invasions.	Adaptable wildlife management systems; Early detection and rapid response programs. Exploitation of IAS for financial gain
Malawi	Proliferation of invasive aquatic plants in lakes and rivers, and the potential introduction of alien fish species pose significant threats to biodiversity and ecosystem health. Spread of invasive plants on rangelands	Increasing regional cooperation and awareness campaigns targeting invasive species in water bodies.	Public education programs and community-based monitoring; regional partnerships for knowledge sharing and resources.
Namibia	Spread of invasive plants in arid and semi-arid areas; Potential spread of invasive insects, like termites.	Enhanced enforcement of environmental regulations and growing interest in regional collaboration.	Comprehensive legal frameworks, proactive early detection systems, and effective control measures for rapid response.
Uganda	Spread of invasive plants, such as giant sensitive plant ( <i>Mimosa pigra</i> ), congress grass ( <i>parthenium hysterophorus</i> ), lantana camara, giant salvinia ( <i>Salvinia molesta</i> ) and other alien species threatening native vegetation; Potential invasion of non-native fish species.	Greater community involvement in monitoring and managing water ecosystems.	Public awareness and community-led education to enhance IAS monitoring, detection, prevention, and reporting; Regional collaboration to share expertise and resources for effective IAS management.
Tanzania	Spread of invasive plants, such as <i>Prosopis juliflora</i> and <i>Parthenium hysterophorus</i> ; Potential spread of alien animals, including rats and mice.	Increasing integration of IAS control into wildlife and ecosystem management strategies.	Adaptable wildlife management systems; Rapid response measures for invasive species.





Zimbabwe	Spread of invasive plants, such as <i>Prosopis juliflora</i> and <i>Lantana camara</i> ; Potential invasion by alien rodents and reptiles.	Strengthened environmental policy enforcement and increased local engagement in IAS management.	Robust regulations with strict enforcement to prevent IAS introduction and spread; Proactive surveillance and rapid response mechanisms for early detection and effective management.
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## 1.2 What Are Invasive Alien Species (IAS)?

Invasive Alien Species (IAS) are non-native species that, when introduced to new areas, can cause significant harm to biodiversity, human health, and economies. These species often outcompete native plants and animals, disrupt ecosystems, and change the way natural habitats’ function.

### 1.2.1 How Do Invasive Alien Species Spread?

Invasive Alien Species spread through a four-step process of biological invasion:

- 1. Transport:** IAS are moved from their native range to new regions, often through human activities like trade, travel, or intentional introductions (e.g., for agriculture or ornamental purposes).
- 2. Introduction:** Once introduced, these species find their way into new habitats, sometimes accidentally, sometimes on purpose.
- 3. Establishment:** If the species finds a suitable environment, it begins to reproduce and form stable populations. This is when IAS start becoming a real concern.
- 4. Spread:** Once established, the species quickly expands, outcompeting native species and disrupting local ecosystems, often with lasting effects.





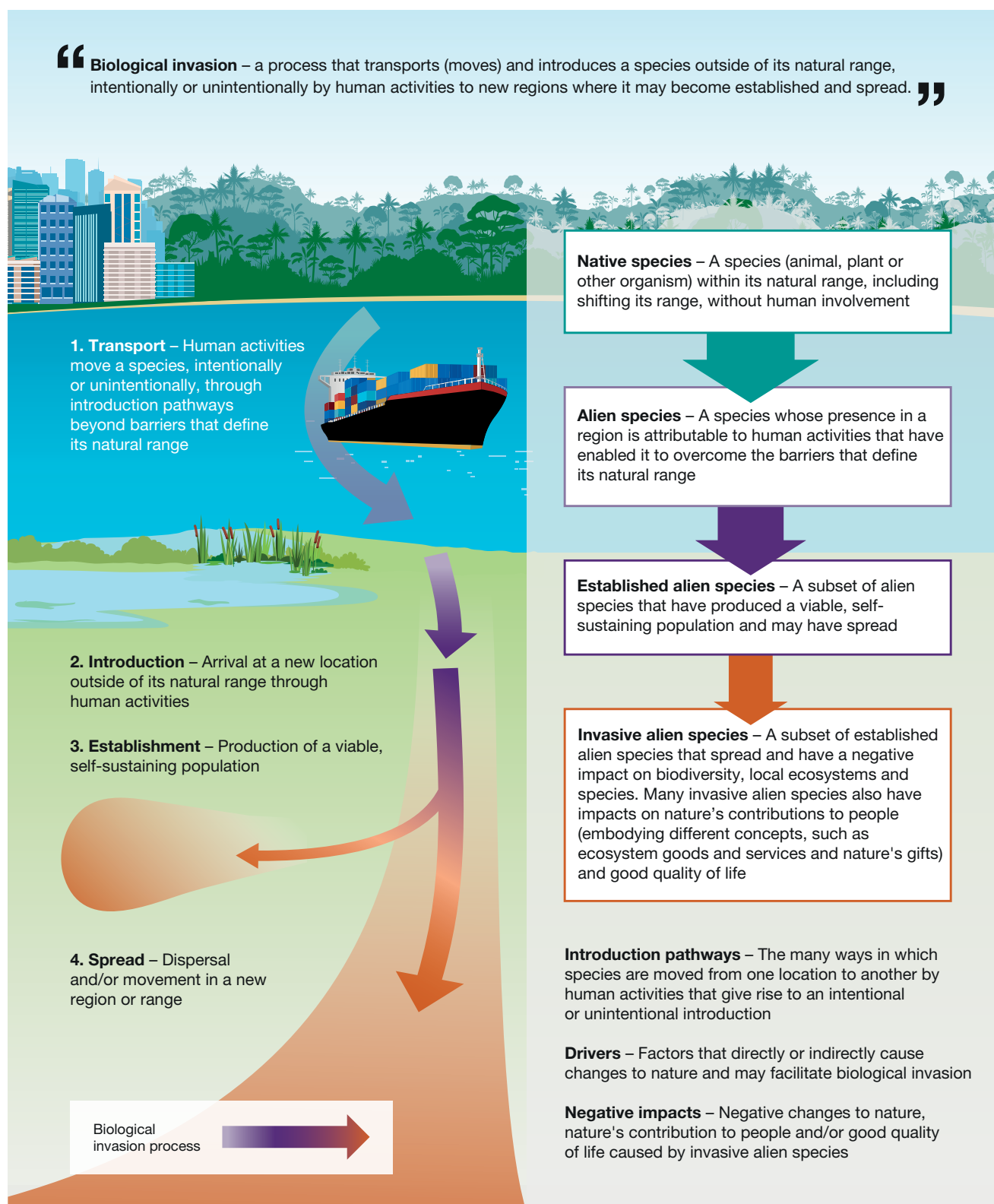


Figure 1.1: This diagram, based on the IPBES Invasive Alien Species Assessment Report, outlines the process of biological invasion. It begins with the transport of alien species, followed by their introduction into a new environment. Once established, these alien species can spread rapidly, often outcompeting native species and causing significant ecological damage. Understanding this process allows us to take proactive steps to prevent the introduction and spread of invasive species. (Roy et al., 2023)



### 1.2.2 Extent of the Problems Caused by Invasive Alien Species (IAS)

As shown in Figure 1.2, adopted from the global IAS assessment report (Roy et al., 2023), Invasive Alien Species (IAS) represent a global threat with widespread impacts across various regions. The figure highlights the extent of these impacts in three main areas: native species extinctions, economic costs, and disruptions to quality of life. IAS have been linked to both global and local extinctions of native species, contributing to significant biodiversity loss. The economic costs of biological invasions have increased considerably over the decades, further compounding the problem. Additionally, a large percentage of reported IAS impacts on quality of life are negative, affecting human well-being in multiple ways. Regional differences in the economic burden of IAS are evident, with certain regions facing higher costs. The taxonomic distribution reveals that plants, invertebrates, and vertebrates are the primary contributors to local extinctions caused by IAS. These findings underscore the urgent need for comprehensive action to manage and control invasive species.



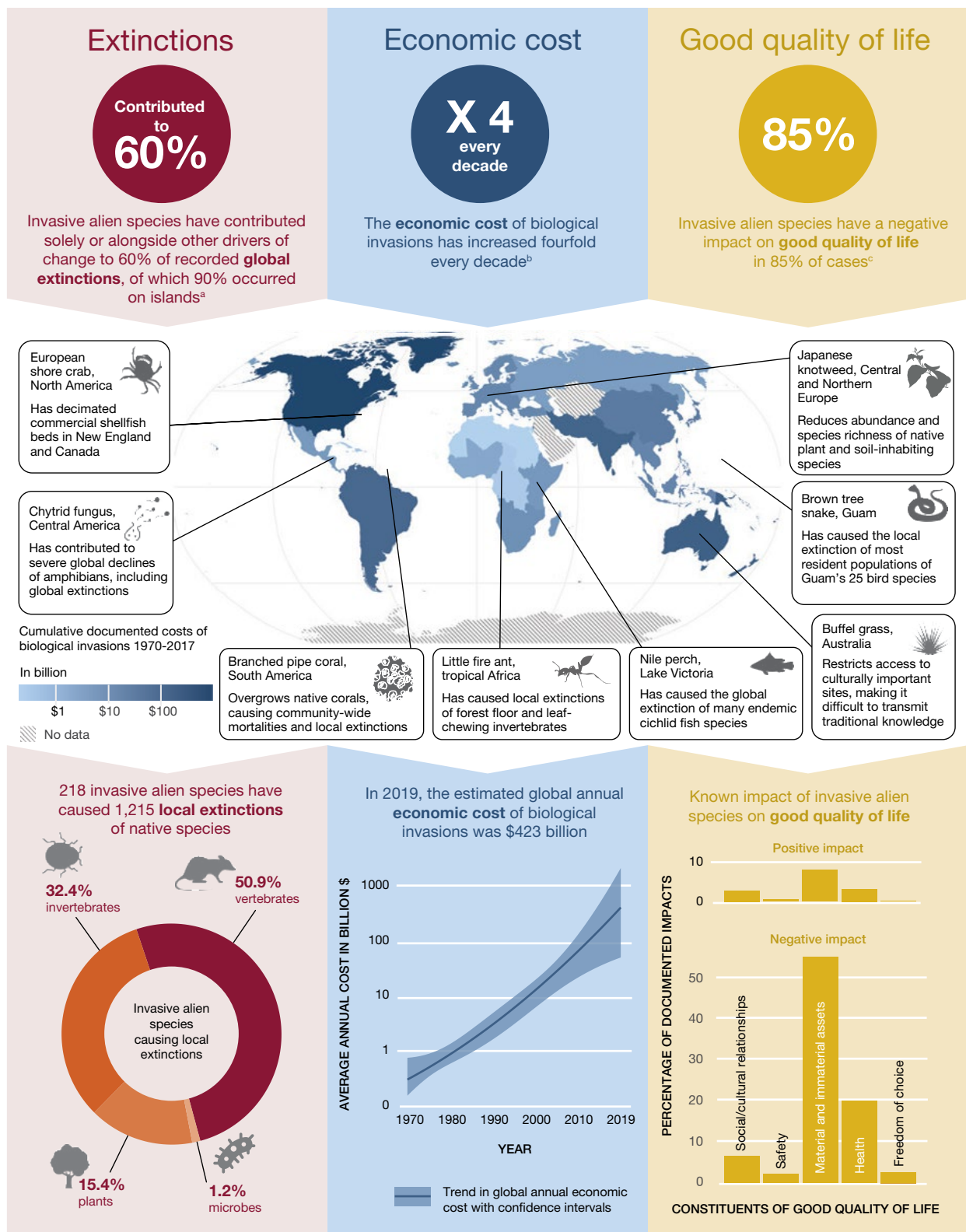


Figure 1.2: Global Extent of Invasive Alien Species (IAS) Impacts. This diagram, adapted from the global IAS assessment report, illustrates the widespread effects of IAS on native species extinctions, economic costs, and disruptions to quality of life. It highlights the significant rise in the economic burden over decades, the negative impacts on human well-being, and the taxonomic distribution of IAS-induced extinctions across regions. The data emphasizes the urgent need for effective management and control strategies to address the global threat of IAS.





### 1.3 What Is Sustainable Use of Wild Species (SU)?

Sustainable Use (SU) means using nature's resources in a way that meets the needs of today without compromising the ability of future generations to meet their needs. It is about using biodiversity responsibly, ensuring that the species we rely on remain available in the long term, without depleting or damaging ecosystems. In the context of wild species, this entails using plants, animals, fungi, and algae in ways that preserve their populations and habitats, ensuring they continue to provide essential resources such as food, medicine, and cultural benefits (IPBES 2022).

#### 1.3.1 How Does SU Work?

- **Balance Resource Use and Ecosystem Protection:** Sustainable use of wild species ensures that resources like food, medicine, and materials are harvested responsibly while preserving the ecosystems that provide them. For example, setting quotas and guidelines for medicinal plant harvesting maintains healthy populations and intact ecosystems, supporting long-term biodiversity and ecosystem services like clean water, pollination, and climate regulation. This approach integrates community management and traditional knowledge to safeguard agriculture, livelihoods, and environmental health.
- **Incorporate Traditional and Local Knowledge:** Indigenous and local knowledge (ILK) plays a key role in managing natural resources. Many communities have developed sustainable ways of using wild species that have been passed down through generations. Mainstreaming and using this knowledge into conservation and management practices helps us make better conservation decisions that are inclusive and culturally sensitive.
- **Ensures Long-Term Viability:** Sustainable use of wild species ensures that biodiversity is available for the long term. For instance, managing forests sustainably can provide timber and fuel without depleting the resource, supporting both local economies and ecosystems. By focusing on long-term outcomes, we help safeguard the natural world and the resources it provides for future generations.

### 1.4 Response Mechanism

In terms of responses, studies reveal that most countries employ reactive strategies, with very few adopting proactive approaches. While approximately 87% of African countries recognize invasive alien species as a national threat, only 16.7% have adequate border control procedures. Moreover, over 66.7% lack a comprehensive management strategy for IAS (Sileshi et al., 2019).

Research show that IAS and their negative effects can be prevented and mitigated through effective management (McGeoch et al., 2024). Preventing the introduction of invasive alien species is the most cost-effective management option. When prevention fails or is not feasible, preparedness, early detection, and rapid response are effective in reducing the establishment rates. Eradication has proven to be effective and cost-efficient for certain invasive alien species, particularly when their populations are small and spreading slowly in isolated ecosystems such as islands. When eradication is not possible for various reasons, invasive alien species can be contained and controlled, especially in closed terrestrial and aquatic systems.



*Table 4: Percentage of Countries (Out of 54 with Available Data) with Capacity to Respond to Invasive Alien Species (IAS)  
Adapted from Sileshi et al., 2019*

Policy Category	Response Capacity (Measures) 1)	% of Countries	Comments
Reactive			
Reactive policies aim to manage already established IAS	2) IAS are recognized as a major national threat	87.4%	47 out of 54 countries have ratified the CBD; 52 have ratified the IPCC
	3) National lists of IAS and their invasion potential are available	66.7%	5.6% have a complete list; 23% have a list of a small number of high-profile species
	4) Comprehensive management plans in place for IAS currently causing issues	33.3%	However, all plans address only a few species
	1) Legislation related to IAS management, including biosafety laws	37.0%	Only 3 out of 55 countries have laws on animal and plant biosafety
Proactive			
Proactive policies aim to detect or counter IAS	2) Border controls in place to prevent the introduction of IAS	16.7%	Only 2 countries have a comprehensive border control system
	3) Research programs and international collaboration targeting IAS	17.0%	Mainly through CABI and CGIAR centres
	National coordination of efforts and management within the country	1.8%	Only in South Africa

### 1.5 Nexus Assessment: Interlinkages Between Biodiversity, Water, Food, and Health

The IPBES [Nexus Assessment](#) highlights the interconnected challenges of biodiversity loss, water scarcity, food insecurity, health risks, and climate change. It provides evidence of their interdependencies, emphasizes the need for integrated solutions, and outlines trends, response options, and a roadmap for applying nexus approaches to maximize synergies and minimize trade-offs. Below is a detailed summary of the key findings:





### 1.5.1 Trends

The Nexus Assessment identifies several concerning trends:

- **Biodiversity Loss:** There is a significant decline in biodiversity across all regions, driven by habitat destruction, pollution, overexploitation, invasive species, and climate change.
- **Water Scarcity:** Freshwater resources are under increasing pressure due to overuse, pollution, and climate-induced changes in hydrological cycles.
- **Food Insecurity:** Agricultural systems face challenges from soil degradation, loss of pollinators, and climate variability, threatening food production and security.
- **Health Risks:** Environmental degradation contributes to the emergence of zoonotic diseases, malnutrition, and respiratory issues, linking ecosystem health directly to human health.
- **Climate Change:** Climate change exacerbates existing environmental stresses, leading to more frequent extreme weather events, shifting ecosystems, and increased species extinction rates.



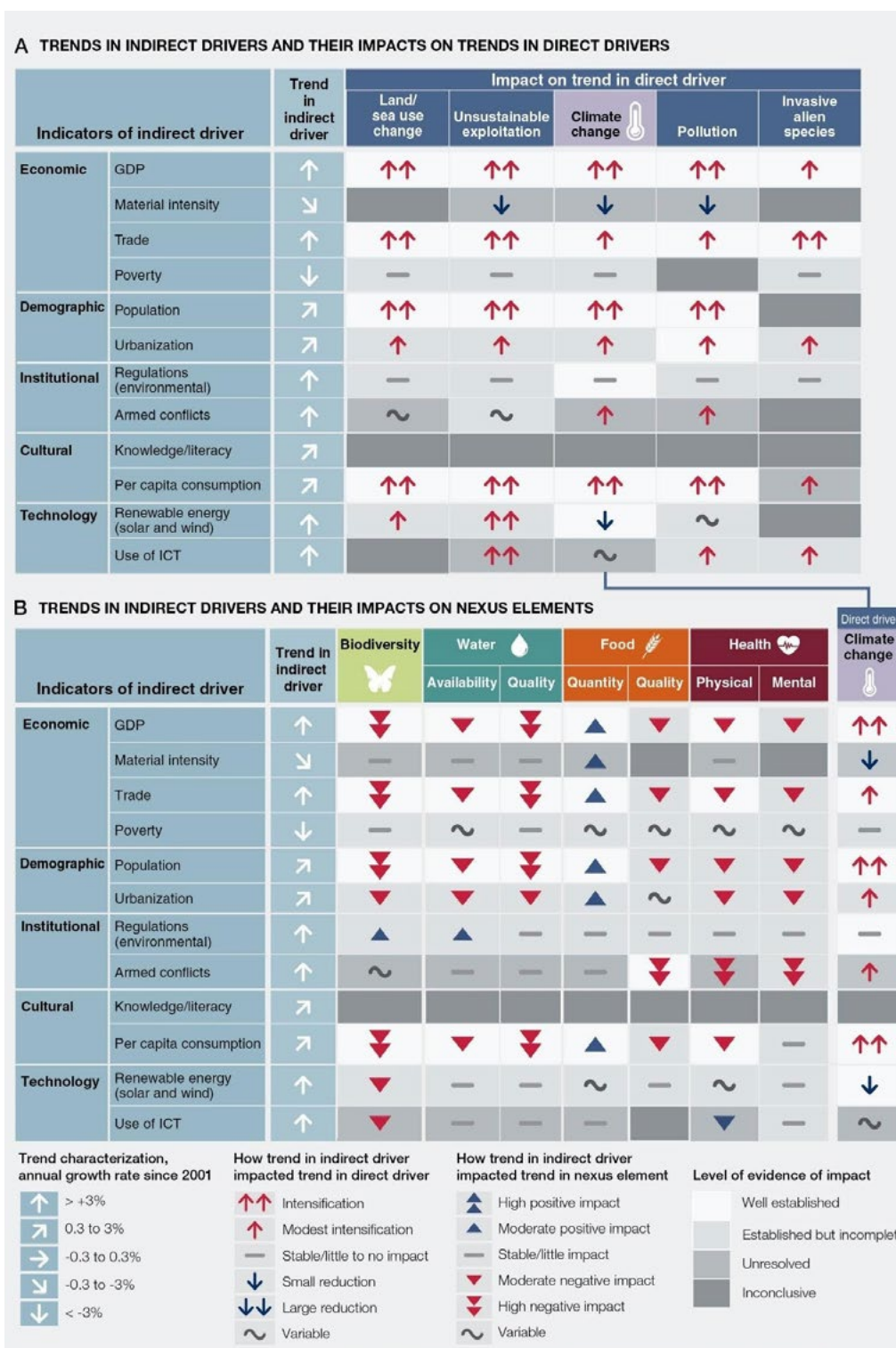


Figure 1.4: This figure highlights how global trends affect key challenges (A) shows how factors like economic growth, population, and technology (indirect drivers) have fuelled pressures like deforestation and pollution (direct drivers), intensifying problems like climate change. (B) part examines how the same global trends impact essential areas: biodiversity, food, water, and health. Climate change appears twice because it's both a pressure (A) and a key issue (B). Data reflects trends from 2001 to 2021, showing greater impacts from high-income countries' consumption. Abbreviations: GDP (gross domestic product), ICT (information and communication technologies).



### 1.5.2 Evidence

The assessment provides robust evidence of the interlinkages among these elements:

- **Ecosystem Services:** Healthy ecosystems provide services such as pollination, water purification, and climate regulation, which are essential for human well-being.
- **Feedback Loops:** Degradation in one area (e.g., deforestation) can lead to negative outcomes in others (e.g., reduced water quality), creating feedback loops that exacerbate environmental challenges.
- **Integrated Impacts:** Policies targeting a single issue without considering interconnectedness can lead to unintended consequences, highlighting the need for integrated approaches.





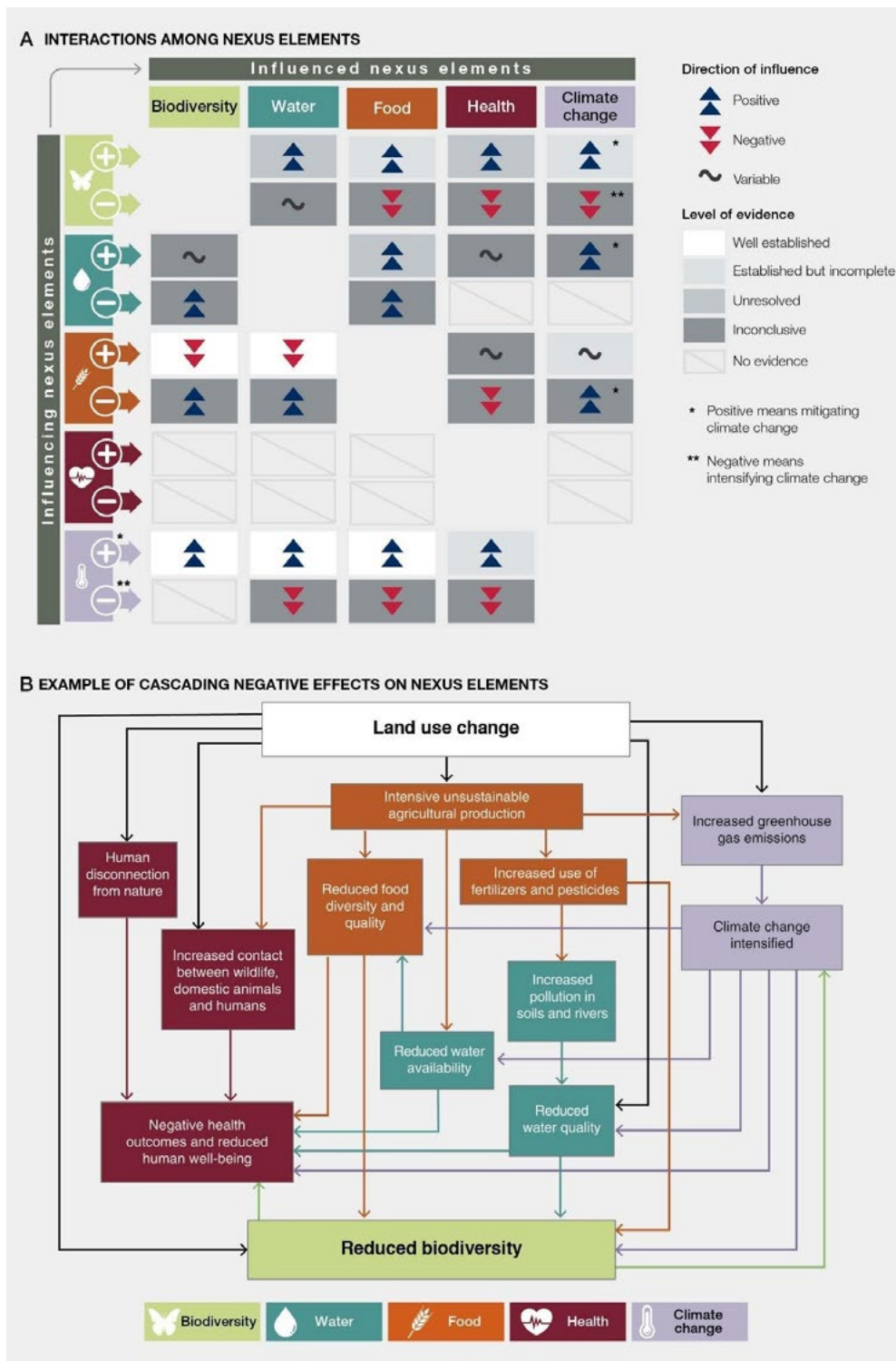


Figure 1.5: This figure simplifies complex interconnections, emphasizing the need for integrated decision-making to avoid harmful ripple effects:- Panel A: Highlights how changes in one area (biodiversity, water, food, health, and climate) can positively or negatively affect others. The evidence, gathered from studies examining multiple nexus elements, is shown using (+) for positive effects (e.g., reducing climate change) and (-) for negative effects (e.g., amplifying climate change). The strength of evidence is categorized as strong, inconclusive, or unresolved. Panel B: Provides an example of how land-use changes for unsustainable agriculture can trigger a chain reaction of negative impacts across the nexus elements, such as reduced biodiversity, water scarcity, and worsened climate conditions.

### 1.5.3 Response Options

The Nexus Assessment outlines several approaches and more than 70 specific response options to address these interconnected challenges:

- **Integrated Policy Frameworks:** Develop policies that consider the interdependencies among biodiversity, water, food, health, and climate to ensure coherent and effective interventions.
- **Sustainable Agricultural Practices:** Promote agroecology, crop diversification, and sustainable water management to enhance food security while preserving ecosystems.
- **Ecosystem Restoration:** Invest in restoring degraded ecosystems to regain their functionality and the services they provide, such as carbon sequestration and water filtration.
- **Cross-Sectoral Collaboration:** Encourage collaboration among sectors (e.g., agriculture, health, environment) to develop holistic solutions that address multiple challenges simultaneously.
- **Community Engagement:** Involve local communities in decision-making processes to ensure that interventions are context-specific and socially acceptable.
- **Monitoring and Evaluation:** Establish robust monitoring systems to assess the effectiveness of implemented strategies and adapt them as necessary.





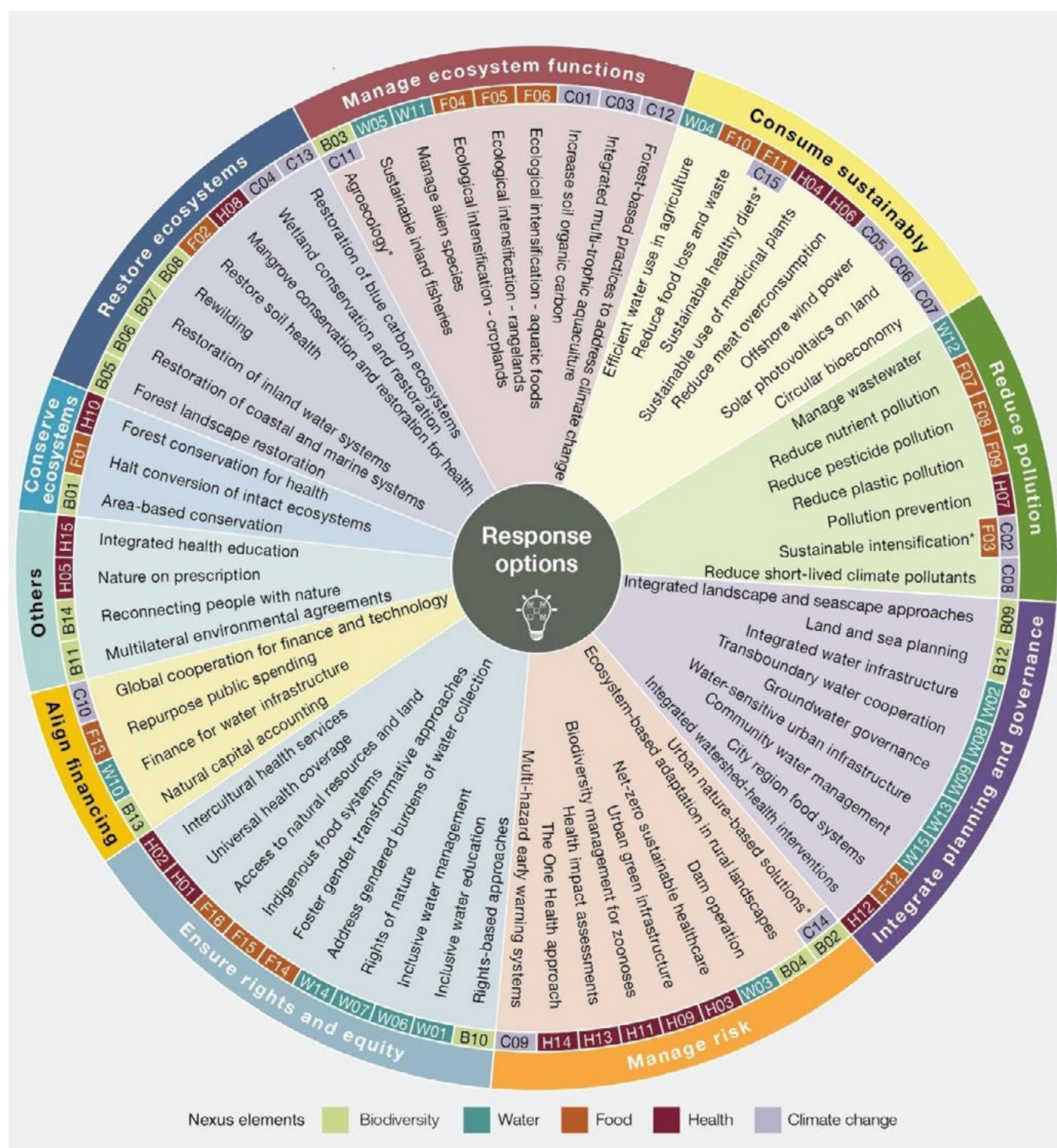


Figure 1.6: This figure highlights 71 response options that can be implemented by various groups to address challenges in biodiversity, water, food, health, and climate. These options are grouped into 10 action categories, shown around the circle's outer edge. Each option is labelled with a unique code indicating its focus area (B for biodiversity, W for water, F for food, H for health, and C for climate) and a number for easy reference throughout the report.





#### 1.5.4 Roadmap for Applying Nexus Approaches

The assessment proposes a roadmap to implement nexus approaches effectively:

- **Problem Identification:** Clearly define the interconnected challenges and their scope within specific contexts.
- **Stakeholder Mapping:** Identify all relevant stakeholders, including government agencies, NGOs, local communities, and the private sector.
- **Capacity Building:** Enhance the capacities of stakeholders to understand and manage nexus interlinkages through education and training.
- **Policy Integration:** Develop integrated policies that address multiple nexus elements, ensuring coherence across different sectors and scales.
- **Implementation:** Apply the integrated policies through coordinated actions among stakeholders, ensuring resource allocation aligns with nexus objectives.
- **Monitoring and Feedback:** Continuously monitor outcomes, gather feedback, and adjust strategies to respond to new information and changing conditions.
- **Adaptive Governance:** Establish governance structures that are flexible and can adapt to emerging challenges and opportunities within the nexus framework.
- **Knowledge Sharing:** Promote the exchange of best practices and lessons learned to facilitate the scaling up of successful nexus approaches.



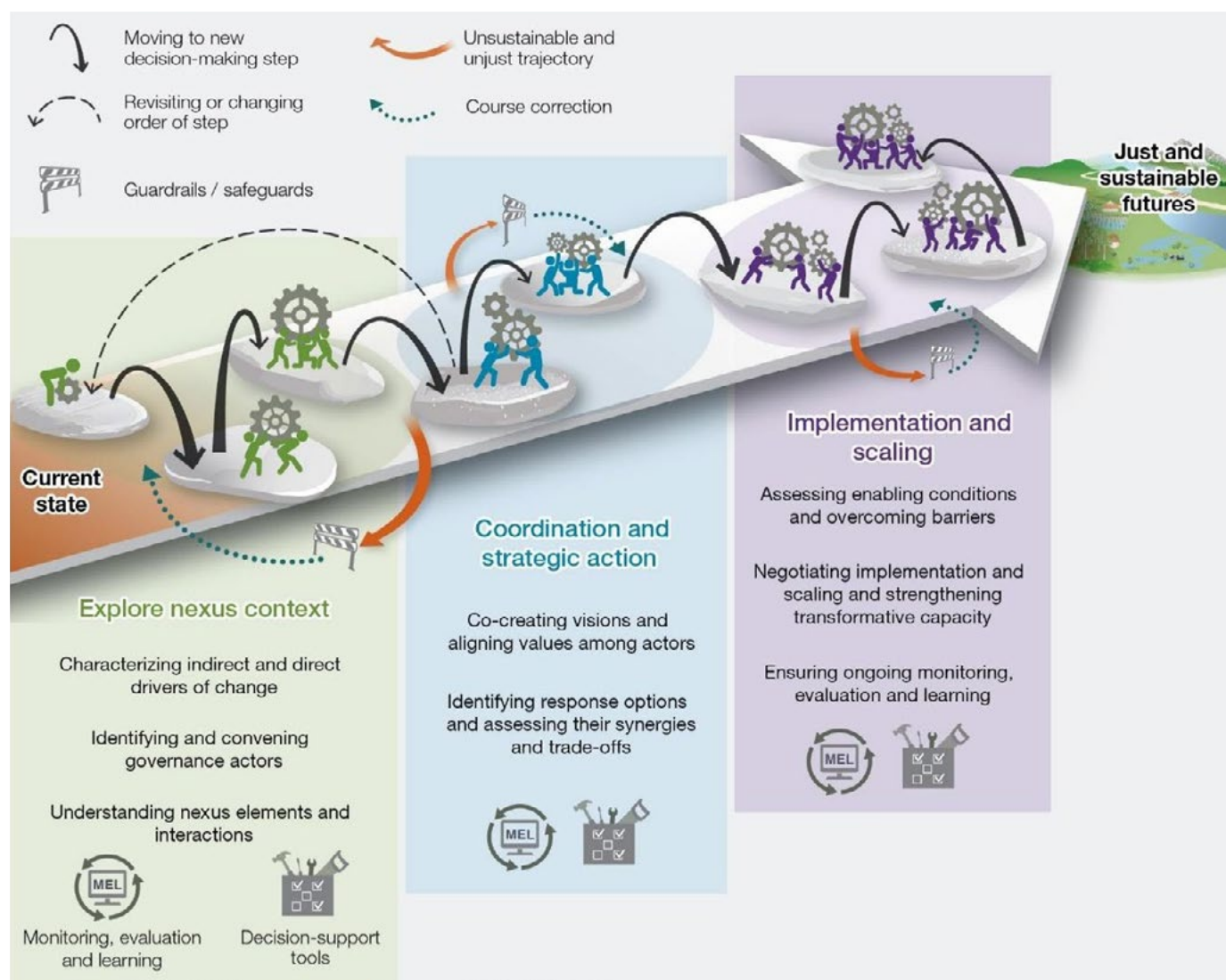


Figure 1.7: This figure shows a step-by-step guide to using nexus approaches for achieving fair and sustainable solutions. The roadmap is divided into three main phases: (1) Exploring the Problem by understanding the context and key challenges, (2) Coordinating and Planning by develop strategic actions and partnerships, and (3) Implementation and Scaling through putting solutions into practice and expand their reach.

Each phase involves tools like public engagement, training, innovation, and policy design to support decisions. The process is not strictly linear – steps may need to be revisited, adjusted, or done in a different order, as shown by arrows in the diagram. Monitoring, evaluation, and learning are key throughout, with opportunities to correct course if actions risk leading to unfair or unsustainable outcomes. The green dotted lines highlight checkpoints to ensure solutions stay on track for creating a just and sustainable future.

Implementing this roadmap requires commitment at all levels, from local communities to international bodies, to achieve sustainable and resilient outcomes that recognize the interconnected nature of our environmental challenges.



## 2. WHAT IS THE PROBLEM?

### 2.1 Problem at Regional Level

The East and Southern Africa region faces interconnected challenges related to unsustainable biodiversity use and invasive alien species (IAS). These issues stem from environmental, economic, and social factors that undermine biodiversity, ecosystem health, and livelihoods of millions across the region.

#### 2.1.1 Sustainable Use (SU) Challenges

- **Unsustainable Practices:** Agricultural expansion, logging, overharvesting, and pollution drive resource depletion. For instance, subsistence farming in Uganda and Tanzania has led to significant land-use changes, while timber production in Zimbabwe contributes to deforestation.
- **Community Vulnerability:** Many communities depend on biodiversity for food, medicine, and cultural practices, making them susceptible to ecosystem degradation. Heavy reliance on firewood and medicinal plants in Tanzania exacerbates this issue.
- **Knowledge Gaps:** While communities apply traditional knowledge for sustainability, many remote areas lack resources and support to adopt and enhance practices like agroforestry.
- **Policy Challenges:** Economic growth often prioritizes resource-intensive sectors like mining and logging, with short-term gains overshadowing long-term sustainability. Policies in Botswana and Zimbabwe illustrate this bias.
- **Population Pressure:** Rapid population growth intensifies resource demand in some countries, stressing fragile ecosystems and calling for urgent management reforms.
- **Erosion of Indigenous and Traditional Knowledge:** Indigenous and traditional practices vital for sustainability are being replaced by unsustainable modern methods. In Uganda, undervaluation of traditional forest management knowledge limits sustainable policy development.
- **Climate Change Impacts:** Shifting rainfall patterns and extreme weather exacerbate resource stress, disrupting farming in Malawi and degrading forests in Zimbabwe.

#### 2.1.2 Invasive Alien Species (IAS) Challenges

- **Biodiversity Threats:** IAS, such as the Nile perch (*Lates niloticus*) in Lake Victoria, disrupt native species and aquatic ecosystems.
- **Economic Impacts:** Pests like the fall armyworm devastate crops in Zimbabwe, undermining food security and local economies.





- Health Risks: IAS, like the Asian tiger mosquito, spread diseases such as dengue fever, straining health systems in Tanzania.
- Facilitators of Spread: Climate change and globalization accelerate IAS spread, as shifting rainfall patterns in Namibia create new habitats.
- Limited Awareness: Public understanding of IAS threats is low, and inadequate resources hinder early detection and management in countries like Uganda.
- Ecosystem Disruption: IAS such as *Lantana camara* in Tanzania outcompete native species, degrading habitats and reducing pasture quality in Zimbabwe.
- Cross-Border Challenges: Regional coordination is crucial but hindered by political and logistical barriers. For example, managing *Prosopis juliflora* requires collaborative action.



### 2.1.3 Call to Action

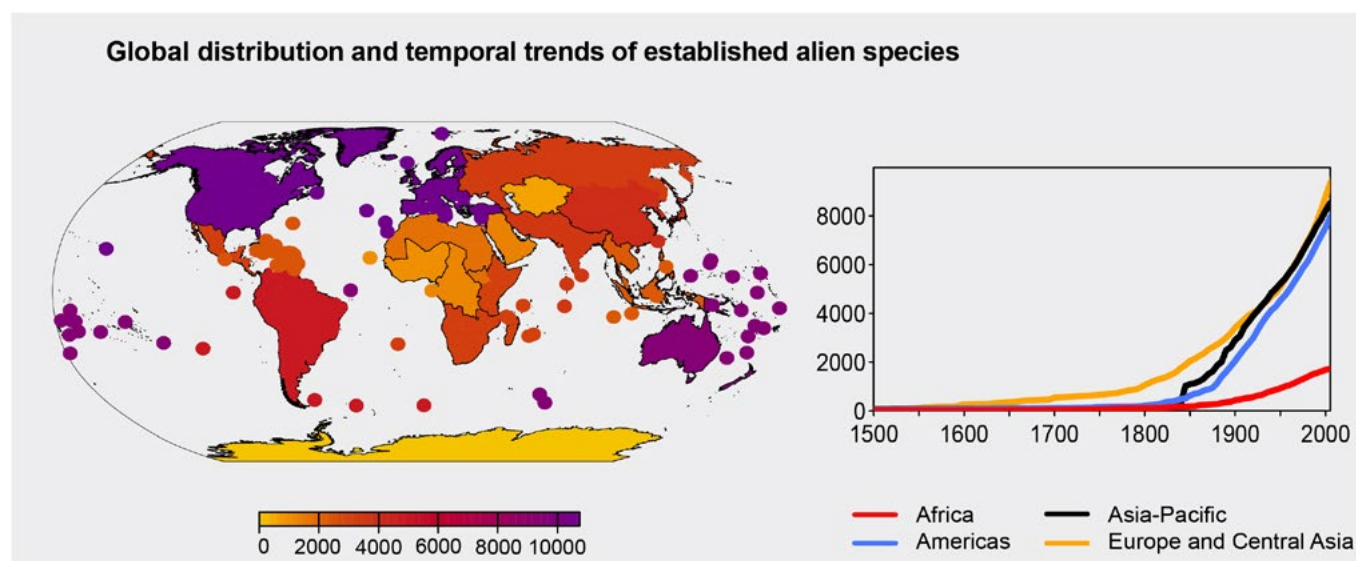
Addressing these challenges requires a combination of sustainable practices, community engagement, and regional collaboration. Prioritizing early detection, risk assessments, and cross-border initiatives can protect biodiversity, support livelihoods, and enhance resilience to climate impacts. Examples include promoting agroforestry, establishing regional IAS task forces, and empowering Indigenous knowledge systems.

## 2.2 Trends in Invasive Alien Species and Sustainable Use of Wild Species

### 2.2.1 Global Trends

Across the globe, invasive alien species and the sustainable use of wild species are pressing challenges with far-reaching ecological, economic, and social impacts. Human activities, like global trade, travel, and climate change are accelerating the spread of IAS. Today, over 37,000 alien species have been introduced worldwide, and about 3,500 of these are invasive, causing profound harm to ecosystems (Roy et al., 2023). The economic toll is staggering, with IAS inflicting losses of more than \$423 billion annually. As globalization deepens and climate change creates new opportunities for species to invade, these numbers are only expected to grow. Protecting biodiversity and managing IAS has never been more urgent, but with collaborative efforts and innovative solutions, we can slow their spread and reduce their impacts.












































*Figure 2.2 IPBES diagram showing where alien species are found around the world and how their numbers have increased over time. The map highlights the spread of these species across continents, while the graph shows their rapid growth over the past few centuries. This data emphasizes the growing threat invasive species pose to biodiversity and ecosystems. By understanding these patterns, we can take steps to prevent their introduction and reduce their impact. Source (Roy et al., 2023)*

On the other hand, there is growing global recognition of the importance of sustainably using wild species. International efforts, like the Kunming-Montreal Global Biodiversity Framework, highlight the need to carefully balance resource use with conservation. Practices like ecotourism and community-based conservation have shown success in preserving biodiversity while supporting local economies. However, challenges persist. Meeting the increasing global demand for natural resources while ensuring sustainable practices requires continuous collaboration, innovation, and a deep understanding of local contexts. Striking this balance is essential for protecting both ecosystems and the communities that depend on them.



Practice	Use category	20-year global trends		Comments	Chapter section
		use	sustainable use		
FISHING 	Food Feed			Corresponds to large-scale fisheries with intensive management, data rich	3.3.1.2
				Corresponds to large-scale fisheries with weak management, data limited	3.3.1.2
				Corresponds to small-scale fisheries, based on a range of sources	3.3.1.5.1
	Medicine Hygiene			Based on stock status and total weight of products	3.3.1.4.2
	Recreation			Data limited	3.3.1.5.3
GATHERING 	Food Feed			Based on a range of sources	3.3.2.3.4
	Medicine Hygiene			Based on population trends, threatened categories and CITES listing	3.3.2.3.5
	Decorative Aesthetic			Based on threatened categories and CITES listing	3.3.2.3.2
LOGGING 	Materials Construction			Based on total legal wood removal	3.3.4.4.3
	Energy			Based on a range of sources	3.3.4.4.2
TERRESTRIAL ANIMAL HARVESTING 	Recreation			Based on population trends, threatened categories and CITES listing	3.3.3.2.4
	Food Feed			Based on increasing demand for wild meat in commercial markets, population trends	3.3.3.3.3
NON-EXTRACTIVE PRACTICES 	Recreation			Based on amount of tourism revenue generated	3.3.5.2.4
	Ceremony Ritual			Data limited	3.3.5.2.1
	Medicine Hygiene			Data limited	3.3.5.2.3

 WELL ESTABLISHED
 ESTABLISHED BUT INCOMPLETE
 UNRESOLVED
 INCONCLUSIVE







  STRONGLY OR SLIGHTLY INCREASING
  STRONGLY OR SLIGHTLY DECREASING
 STABLE
 HIGH VARIABILITY IN TRENDS

Figure 2.0.2: This figure shows global trends in wild species use across categories, with arrows indicating increases, decreases, or stability over the past 20 years. Colours represent whether use is sustainable or unsustainable. It highlights the rising unsustainable use of many species, especially for food, medicine, and materials, emphasizing the urgent need for sustainable practices in fishing, gathering, and logging. Source (Fromentin et al., 2022)





### 2.2.2 Continental Trends

Africa's rich and diverse ecosystems are vital for millions of people, providing food, water, and livelihoods. However, these ecosystems face growing threats from invasive alien species (IAS) and unsustainable use of wild species. Species like the *Opuntia spp* (prickly pear cactus) and *Salvinia molesta* (giant salvinia) have degraded wetlands and rangelands, disrupting ecosystem functions and livelihoods (IPBES, 2018; IPBES, 2023). At the same time, overexploitation for bushmeat, timber, and fisheries continues to drive biodiversity loss (Fromentin et al., 2022). Despite these challenges, promising solutions are emerging. Practices like Community-Based Natural Resource Management (CBNRM) and eco-tourism offer opportunities to align conservation goals with economic development (Alcorn et al., IPBES, 2022). Countries like Namibia, Tanzania, and Uganda are leading the way by empowering local communities to manage and protect wildlife and ecosystems (USAID, 2010). Integrating Indigenous and local knowledge (ILK) has enhanced biodiversity and IAS management through culturally relevant strategies. By combining ILK with modern conservation approaches, African countries are creating innovative pathways to sustain both their natural heritage and the well-being of their communities.

### 2.2.3 Regional Trends

East and Southern Africa are regions rich in biodiversity but face pressing challenges from both invasive alien species (IAS) and unsustainable use of Wild species (IPBES, 2022). The region's heavy reliance on natural resources for livelihoods creates a cycle of overuse and degradation, especially in areas where alternative economic opportunities are limited. Climate change compounds these issues, with rising temperatures and erratic rainfall patterns not only affecting agriculture but also creating new opportunities for IAS to spread into previously unsuitable areas (IUCN, 2021). These challenges strain ecosystems and livelihoods but also inspire innovative solutions, collaborations, and policies aimed at protecting and safeguarding biodiversity.

For instance, in the Great Lakes Region, including Lake Victoria, the Nile perch (*Lates niloticus*) increasingly disrupt local fisheries, threatening food security (Roy et al., 2023). Similarly, in Southern Africa's arid landscapes, invasive plants like *Acacia saligna* and *Acacia nilotica* continue to spread, outcompeting native species, degrading habitats, and imposing significant economic costs (Mbow et al., 2017). Furthermore, invasive insects like the large grain borer (*Prostephanus truncatus*) and the fall armyworm which has caused severe damage to agriculture in Zimbabwe and Malawi (Maluleke, 2020), continue to be problematic, adding to the pressures from resource overexploitation. Deforestation, overfishing, and unsustainable agricultural practices further erode biodiversity. In Uganda, Malawi, and Tanzania, land-use changes due to subsistence farming have intensified these pressures, reducing the services ecosystems provide to support daily life (Priyadarshini & Bundela, 2023; Tran et al., 2022).

Amid these challenges, the region is making notable progress. For example, Namibia's community-based conservancies and Tanzania's wildlife management areas demonstrate that conservation can align with local development, creating both ecological and economic benefits (URT, 2019; Weaver



& Petersen, 2008). Regional collaborations, like the [Kavango-Zambezi Transfrontier Conservation Area \(KAZA TFCA\)](#), are tackling cross-border IAS issues, highlighting the power of cooperation in addressing shared challenges (KAZA TFCA, 2020). Efforts like these show the potential of combining innovative solutions, community engagement, and regional partnerships to protect biodiversity and build resilience against growing threats.

Policy frameworks are also evolving to address these concerns. The [SADC Regional Biodiversity Strategy \(RBS\)](#) emphasizes sustainable use of wild species, bio-trade, and value addition, linking biodiversity conservation to economic growth. It provides a platform for transboundary collaboration and addresses gaps such as IAS management and alternative livelihoods. Similarly, the [EAC Regional Biodiversity Strategy and Action Plan \(2021-2031\)](#) prioritizes cross-border surveillance, community involvement, and monitoring to protect shared ecosystems. Programs aiming to interweave Indigenous and local knowledge (ILK), which remains an invaluable resource for sustainable biodiversity management, are gaining pace and recognition, as seen in [Uganda's action plan on invasive species](#).

Opportunities for the region include strengthening biodiversity monitoring systems, advancing IAS control mechanisms, and securing sustainable financing through partnerships with development agencies. By building on frameworks like the SADC Regional Biodiversity Strategy and EAC Strategic Action Plan, East and Southern Africa can chart a path toward resilience, ensuring biodiversity conservation and sustainable livelihoods for generations to come.

## 2.3 Policy Options for Invasive Alien Species (IAS) and Sustainable Use of Wild Species (SU)

### 2.3.1 Invasive Alien Species (IAS): what can be done?

It is important and urgent to work together towards effectively managing IAS across borders. IAS don't recognize national boundaries, making **regional collaboration** essential. Initiatives like the [Kavango-Zambezi Transfrontier Conservation Area \(KAZA TFCA\)](#) show how countries can

- 1) join forces to share knowledge, monitor threats, and coordinate responses (KAZA TFCA, 2020). Expanding these efforts of knowledge sharing, joint monitoring, and coordinated management actions can strengthen ecosystems and stop IAS from spreading.

Catching IAS problems through **early detection and rapid response** can save ecosystems and money. Examples like the [removal of black rats in Pacific islands](#), and Seychelles successful eradication programs targeting [species like feral cats](#) and introduced birds (e.g. Madagascar

- 2) fody and [red-whiskered bulbul](#)), show the importance of effective management and acting quickly. Adopting similar proactive measures in East and Southern Africa; through enhanced monitoring, rapid eradication programs, and biosecurity measures at key entry points, can prevent the establishment of new IAS (Roy et al., 2023).

**Raising awareness and engaging communities** is important, especially with local communities who play a key role in spotting and managing IAS. Public awareness campaigns and community-led monitoring efforts, such as those in Malawi and Uganda, empower people to take action



- 3) (Gosling et al., 2017; Tran et al., 2022). Indigenous and local knowledge (ILK) can further improve management and foster local ownership of conservation efforts.

It is vital to **make IAS management a national priority**. Integrating IAS management into National Biodiversity Strategies and Action Plans (NBSAPs) and National Ecosystem Assessments (NEAs) ensures that IAS control is aligned with national goals. This approach

- 4) secures funding, streamlines policies, and embeds conservation into broader economic and infrastructure planning.

### 2.3.2 Sustainable Use of Wild Species (SU): How to Balance Use and Conservation

The sustainable use of wild species is about finding a balance that allows communities to thrive while protecting biodiversity for the future. To do this, countries can consider:

- 1) **Supporting Community-Based Natural Resource Management (CBNRM)**. Community-driven approaches like those in Namibia and Tanzania have shown how blending traditional knowledge with modern practices supports conservation while providing communities with social and economic benefits (Alcorn et al., 2002; USAID, 2010). These systems often incorporate traditional knowledge with modern conservation practices, offering a cost-effective and locally supported way to manage wild species.
- 2) **Encouraging sustainable tourism and eco-tourism** which can generate income while preserving biodiversity. Countries like Botswana and Tanzania have demonstrated the economic potential of wildlife-based tourism (Alcorn et al., 2002; Pallagyo, 2007). By promoting eco-friendly tourism policies, we can fund conservation efforts and provide alternative livelihoods.
- 3) **Fostering the inclusion of ILK into conservation policies** at national and regional levels. For example, most of the Indigenous Peoples and local communities within the region have invaluable knowledge about sustainable use of wild species (McElwee et al., 2020). Mainstreaming ILK into official management plans can provide context-specific approaches, promote inclusivity, and ensure that policies are culturally respectful, locally relevant, and effective.
- 4) **Fostering partnerships with the private sector** through engagement with businesses that depend on natural resources, like forestry, agriculture, and fisheries which can unlock innovation and funding for conservation (Fromentin et al., 2022). Encouraging certification schemes, such as the Forest Stewardship Council (FSC) for sustainable timber, could help reduce unsustainable practices and support market-driven conservation.
- 5) **Adopting adaptive management and ecosystem restoration strategies**, especially in the face of climate change, which allow for flexibility in response to emerging threats, build resilience, and ensure that resources remain available for the future. This approach has been successful in Zimbabwe (Chirisa, 2013; Wolmer et al., 2004), where efforts to restore grasslands and wetlands have improved both biodiversity and local livelihoods.





## 3. OVERVIEW OF THE NATIONAL CONTEXT



### 3.1 Botswana

Botswana's biodiversity faces growing pressures from IAS and climate change, both of which pose challenges to ecosystem health and livelihoods. While climate change has widespread effects, the threat posed by invasive species varies, with

**Area:** 581,730 km<sup>2</sup>

**Population:** 2.675 million (2023)

**Main Economic Sectors:** Mining (diamonds, copper, nickel), agriculture (livestock), and tourism

**Main Ecosystems:** Deserts (Kalahari), savannas, and wetlands (Okavango Delta)

some areas experiencing significant impacts while others remain largely unaffected. In the southwest of the country, *Prosopis glandulosa* is becoming a problem. In the Okavango Delta, *Salvinia molesta* is a threat to the aquatic environment (CBD, 2018). Additionally, there are other invasive species of concern such as water hyacinth (*Eichhornia crassipes*) found in the Limpopo river, e.g. the *Cenchrus biflorus* (sandbur/ gallons curse) which is more prevalent in the western part of the country. Key species such as *Prosopis juliflora* (mesquite) and *Salvinia molesta* (water fern) outcompete native flora, reducing grazing areas and depleting groundwater, thus affecting rangelands and freshwater ecosystems. These issues particularly impact rural communities reliant on agriculture and pastoralism. While Community-Based Natural Resource Management (CBNRM) has contributed to wildlife conservation and community development, challenges such as unequal benefit distribution and external shocks like COVID-19 have hindered its impacts (Esposito et al., 2020). Botswana's efforts could focus on strengthening IAS control strategies and enhancing ecosystem resilience, in line with IPBES recommendations (B. IPBES, 2019; Roy et al., 2023).



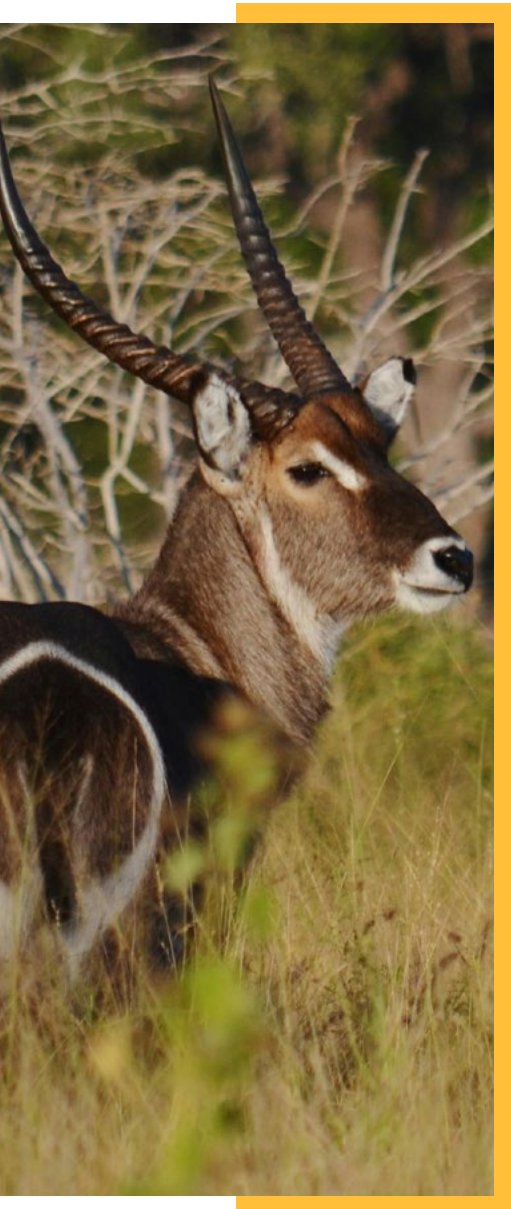
*Table 5: Overview of key economic sectors in Botswana, their contributions to GDP, the impacts of invasive alien species (IAS) and unsustainable use of wild resources, and strategies for mitigation.*

Sector	GDP Contribution	Economic Impact of IAS and UWSU	Mitigation Strategies
<b>Mining</b>	16.7%	IAS disrupt water resources, affecting mining operations, especially water-intensive mining sectors like diamond and copper mining. [Source: (Kashe et al., 2020)]	Implementation of targeted water resource management actions, such as improved catchment restoration and sustainable water use policies, alongside IAS prevention strategies like early detection, rapid response, and habitat restoration in mining areas. [Source: (Murray-Hudson et al., 2023)] Additionally, implement the 2019 Integrated Prosopis Management Strategy through targeted control measures, restoration of native vegetation, and improved water resource management.
<b>Tourism</b>	12%	Biodiversity loss due to IAS negatively impacts wildlife tourism, one of Botswana's key industries. [Source: (Cassidy et al., 2023; Mladenov et al., 2007) ]	Implement targeted IAS management strategies within Botswana's biodiversity conservation initiatives to safeguard key species and habitats [Source: (Republic of Botswana, 2017)]
<b>Agriculture</b>	1.8%	IAS reduce grazing lands, while overgrazing from livestock leads to soil degradation and decreased productivity. [Source: (Kashe et al., 2020)]	Implementation of land management and sustainable grazing practices. [Source: <a href="#">Strategy for Managing Invasive Species in Africa 2021–2030</a> ]

### 3.1.1 Policies and Regulations

Botswana's approach to biodiversity conservation is rooted in its [National Biodiversity Strategy and Action Plan \(NBSAP\) \(2016\)](#) (Republic of Botswana, 2017), which emphasizes IAS management. The Forest Policy of 2011 also provides emphasis on management of IAS. The Wildlife Policy supports sustainable wild species use while integrating IAS control into broader conservation strategies. These policies focus on sensitive ecosystems like the Okavango Delta, combining IAS control with land and water management to protect natural resources and livelihoods.





### 3.1.2 International Commitments

Botswana is an active participant in global biodiversity initiatives, including the [Convention on Biological Diversity \(CBD\)](#) and the [UN Framework Convention on Climate Change \(UNFCCC\)](#), both of which stress the importance of controlling IAS to mitigate biodiversity and climate change impacts. The country aligns its policies with the [Sustainable Development Goals \(SDGs\)](#), particularly Goal 15, focused on life on land and ecosystem protection. Regional collaborations, such as the [Kavango Zambezi Transfrontier Conservation Area \(KAZA TFCA\)](#), play a key role in promoting cross-border cooperation on IAS control and conservation.

### 3.1.3 National Development Connection

The integration of biodiversity conservation into national development strategies reflects Botswana's focus on leveraging ecosystems for sustainable economic growth. As recent studies have shown, tourism contributed 13.1% of Botswana's GDP in 2019, increasing from 6.3% in 2000 (Cavric, 2023), is a significant subset of the broader tourism and travel sector, which accounts for 11.5% of GDP (Cassidy et al., 2023). This reliance on healthy ecosystems underscores the critical need for effective IAS control (Republic of Botswana, 2017). Investments in IAS management can further support agriculture, improve water resources, and contribute to poverty alleviation, aligning with Botswana's broader socio-economic goals (Esposito et al., 2020; Republic of Botswana, 2017).

### 3.1.4 Protected Areas and IAS Control

Botswana's protected areas, including the Okavango Delta and Chobe National Park, play a crucial role in IAS management. Strategies include monitoring programs, habitat restoration, and stakeholder engagement to control species like *Prosopis juliflora* (Esposito et al., 2020). Expanding these efforts to other vulnerable areas can enhance ecosystem resilience and biodiversity conservation.





### 3.1.5 Future Directions and Projections

Botswana can consider the following strategies to address challenges posed by IAS:



#### BRIGHT SPOT

##### Regional Collaboration for IAS Control and Conservation

In Botswana, Community-Based Natural Resource Management (CBNRM) has made significant strides in wildlife conservation and local community development. At the same time, regional efforts, such as the Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA), have fostered cross-border collaboration for effective IAS control and biodiversity conservation. These initiatives are strengthening ecosystem health and creating opportunities for sustainable use of wild resources in the region.

- **Strengthen Climate-Smart Policies:** Improve the implementation of existing adaptive policies by addressing gaps in enforcement, funding, and coordination. Ensure these policies effectively manage rainfall variability, water scarcity, and IAS spread.
- **Empower Communities:** Expand community-led programs that integrate scientific knowledge with Indigenous and local practices. Provide targeted training and resources to enhance IAS monitoring and sustainable management of wild species.
- **Enhance Research and Innovation:** Conduct focused studies on IAS impact and management, prioritizing species and ecosystems most at risk. Support innovation in cost-effective, locally viable control measures.
- **Boost Regional Cooperation:** Strengthen transboundary partnerships to align IAS policies, share best practices, and coordinate management efforts with neighbouring countries.
- **Integrate Conservation and Development:** Align IAS control with national development goals, ensuring that biodiversity protection supports sustainable livelihoods and economic resilience.

By advancing these strategies, Botswana can build ecosystem resilience, mitigate climate impacts, and promote sustainable use of wild species aligned with its national priorities (B. IPBES, 2019).





## 3.2 Malawi

Malawi's reliance on wild species is central to national livelihoods, food security, and energy needs. Lake Malawi provides 70% of the country's animal protein intake and 40% of its total protein intake through wild fish. Meanwhile, forests contribute 75% of rural household energy through fuelwood and account for 90% of the biomass used for energy (Kambewa & Chiwaula, 2010; Tran et al., 2022; USAID, 2010). Agriculture was the sector with the highest costs, with most of the losses coming from resource damages (Fernandez et al., 2023). Co-management programs for fisheries have shown promise in achieving sustainable harvesting while conserving biodiversity. However, overfishing has significantly depleted fish stocks, threatening food security and ecological balance. Additionally, unsustainable charcoal production exacerbates deforestation, particularly in protected areas (Fromentin et al., 2022). In Malawi, approximately 95% of the population relies on biomass, such as firewood and charcoal, as their primary source of domestic energy (Chiumia, 2021), and women, who are predominantly responsible for sourcing and managing these natural resources for household use are disproportionately affected by resource scarcity, making gender-responsive approaches critical to addressing these challenges (Kambewa & Chiwaula, 2010).

**Area:** 118,480 km<sup>2</sup>

**Population:** 20.93 million (2023)

**Main Economic Sectors:** Agriculture (tobacco, tea, sugarcane, cotton, maize), manufacturing (tobacco, tea, sugar processing), and services

**Main Ecosystems:** Forests, savannas, and the Great Rift Valley



*Table 6: Overview of key economic sectors in Malawi, their contributions to GDP, impacts of invasive alien species (IAS) and unsustainable use of wild species, and strategies to address*

Sector	GDP Contribution	Economic Impact of IAS and UWSU	Mitigation Strategies
<b>Agriculture</b>	30%	IAS like water hyacinth ( <i>Eichhornia crassipes</i> ) affect crop yields, while unsustainable farming practices threaten food security and lead to soil erosion.	Promotion of sustainable agriculture and land management practices. [Source: (FAO & UNEP, 2020)]
<b>Forestry</b>	3%	Deforestation and IAS (e.g., <i>Prosopis juliflora</i> ) decrease forest cover, reducing timber and fuelwood availability.	Implementation of reforestation programs and sustainable forest management. [Source: <a href="#">Malawi National Forest Policy, 2021</a> ]
<b>Fisheries</b>	2%	Aquatic IAS, such as water hyacinth ( <i>Eichhornia crassipes</i> ), disrupt fisheries in Lake Malawi, impacting livelihoods and fish production.	Integrated water resource management and removal of invasive species from water bodies. [Source: <a href="#">Malawi Fisheries Management Plan, 2020</a> ]

### 3.2.1 Policies and Regulations

Malawi's [National Environmental Policy \(NEP\) \(2004\)](#) and [Environment Management Act \(EMA\) \(201\)](#) form the backbone of the country's biodiversity conservation and IAS management strategies. These frameworks emphasize sustainable ecosystem management and provide legal mechanisms to regulate invasive species. The [Fisheries Conservation and Management Act \(1997\)](#) focuses on protecting aquatic biodiversity, while the [Forestry Act \(1997, amended 2017\)](#) aims to conserve forests, including provisions for IAS control. Malawi's [Noxious Weeds Act \(1936\)](#) mandates reporting and clearing invasive weeds on private land, with penalties for non-compliance. Additionally, the [National Biodiversity Strategy and Action Plan \(NBSAP II\) \(2015-2025\)](#) aligns with international biodiversity targets, outlining strategies for IAS prevention, detection, and management.

### 3.2.2 International Commitments

Malawi is a signatory to international agreements, including the [Convention on Biological Diversity \(CBD\)](#), [Ramsar Convention on Wetlands](#), and the [Convention on International Trade in Endangered Species of Wild Fauna and Flora \(CITES\)](#). These commitments enhance national capacity for biodiversity conservation and IAS control. Despite these frameworks, ongoing National Ecosystem Assessment (NEA) highlights challenges such as limited resources and data, which impede the fulfilment of international obligations. Strengthened reporting mechanisms and regional cooperation could address these gaps.





### 3.2.3 National Development Connection

Malawi's [Vision 2063 \(MW2063\)](#) prioritizes environmental sustainability as a pillar of inclusive economic growth. Ecosystem degradation, driven by IAS and deforestation, directly threatens food security, economic resilience, and social cohesion. By integrating biodiversity strategies into broader development plans, such as the First 10-Year Implementation Plan ([MIP-1](#)), Malawi can align conservation efforts with national goals for poverty reduction and sustainable growth.

### 3.2.4 Protected Areas and IAS Control

Malawi's protected areas, managed by the Department of National Parks and Wildlife and the Department of Forestry, are crucial for biodiversity conservation. These areas implement IAS control measures, including habitat restoration and monitoring programs. The National Biodiversity Strategy and Action Plan ([NBSAP](#)) and National Invasive Species Strategy and Action Plan ([NISSAP](#)) provide a roadmap for identifying and managing IAS, with a focus on building local capacity and strengthening the use of Indigenous and local knowledge (ILK) and customary governance to support these efforts.



### 3.2.5 Future Directions and Projections

To address the challenges of IAS and support sustainable management of wild species, Malawi could consider the following strategies:

- **Community-Based Conservation:** Expand initiatives that include scientific, Indigenous and local knowledge conservation approaches, emphasizing the inclusion of gender-responsive strategies to enhance community resilience and biodiversity conservation.
- **Sustainable Land Use Practices:** Invest in climate-smart agriculture and sustainable forestry to promote ecosystem restoration while reducing dependence on overexploited natural resources.
- **Public Awareness and Education:** Implement nationwide awareness campaigns to inform communities about the ecological and economic impacts of IAS, fostering proactive engagement in their management.
- **Regional Partnerships:** Strengthen collaboration with neighbouring countries to harmonize policies, share best practices, and address transboundary IAS challenges effectively.

By adopting these strategies, Malawi can mitigate the impacts of Invasive Alien Species, restore degraded ecosystems, and advance sustainable development in alignment with regional and global biodiversity goals.



#### BRIGHT SPOT

##### Co-management Transforming Fisheries and Biodiversity in Malawi

Malawi's co-management programs for fisheries are proving transformative, achieving sustainable harvesting while conserving biodiversity. Guided by Vision 2063 (MW2063), which prioritizes environmental sustainability for economic growth, and supported by the NBSAP and NISSAP, these initiatives focus on building local capacity and integrating Indigenous and local knowledge (ILK) and mainstreaming gender equality. By empowering communities, Malawi is creating resilient systems that balance economic and ecological needs.







### 3.3 Namibia

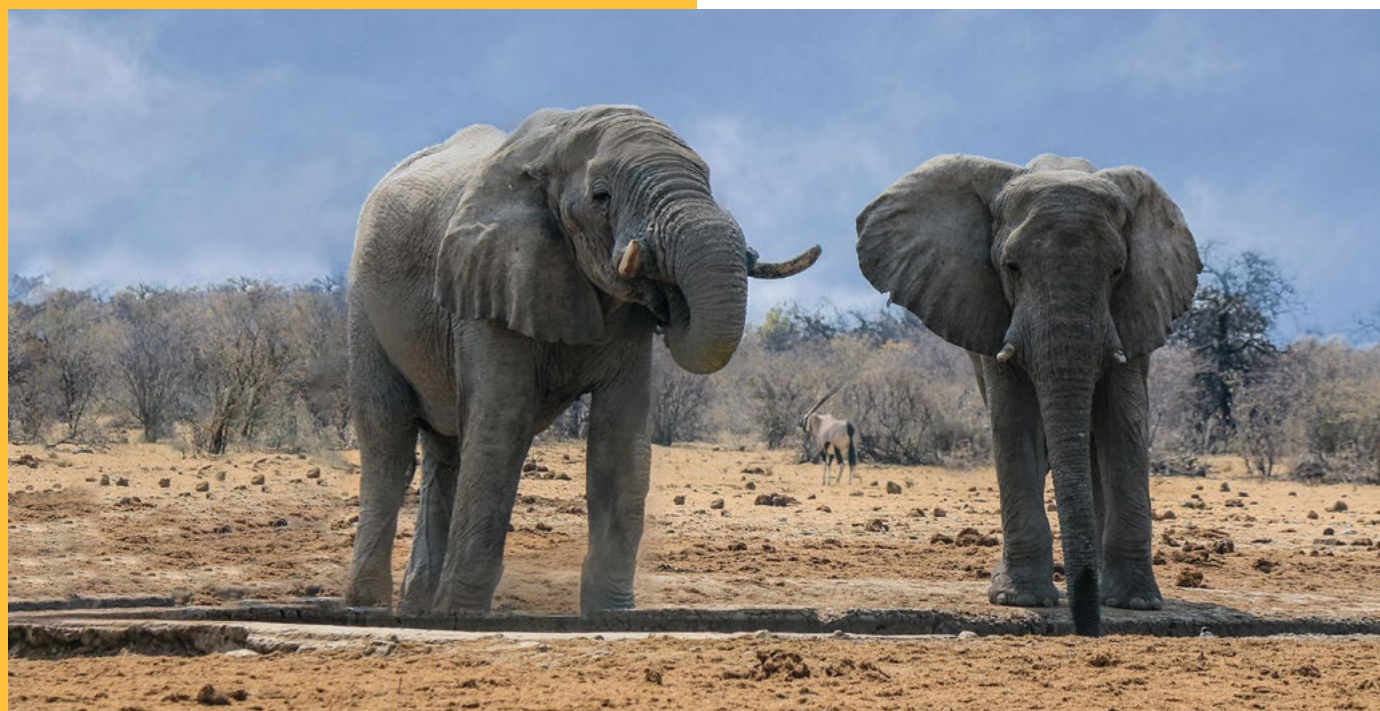
Namibia's rich biodiversity is integral to its cultural heritage, economic development, and the well-being of its people. However, the nation faces significant challenges from Invasive Alien Species (IAS) and the imperative of ensuring the Sustainable Use (SU) of its natural resources (Boy & Witt, 2013). Several invasive alien species have been recorded in Namibia; including 7 fish species, 3 reptiles, 7 birds, 4 snails, 1 crayfish, two mussels and 7 mammals. There are also approximately 38 trees or large shrubs, 62 forbs and 24 grasses. Addressing these issues requires a collaborative approach involving scientists, policymakers, practitioners, Indigenous People and local communities. Namibia's ongoing commitment to biodiversity conservation through tackling IAS and promoting SU reflects a vision to balance ecological health with socio-economic development (Weaver & Petersen, 2008). Collaborative efforts, strengthened by investment in capacity building, research, and community engagement, will be pivotal in preserving Namibia's natural heritage for future generations.

**Area:** 824,292 km<sup>2</sup>

**Population:** 2.604 million (2023)

**Main Economic Sectors:** Mining (diamonds, uranium, gold), agriculture (livestock, crops), and tourism

**Main Ecosystems:** Deserts (Namib and Kalahari), savannas, and coastal regions





*Table 7: 2005 economic contributions of natural resource-based production (N\$ million) in Namibian commercial areas. This table demonstrates Namibia’s heavy reliance on the sustainable use (SU) of wild species, with substantial revenues from wildlife viewing, trophy hunting, and plant and wood products, highlighting the critical value of conserving biodiversity and maintaining ecosystem health. However, the spread of Invasive Alien Species (IAS) poses a significant threat to this balance by disrupting ecosystems, degrading habitats, and undermining the economic and ecological viability of these industries. This underscores the dual importance of promoting SU practices and mitigating IAS impacts to sustain both biodiversity and economic growth. Source (Brown, 2008)*

Commodity	N\$ million
Trophy hunting	316
Live game sales	14.3
Wildlife viewing	2,700
Wood fuel	63
Charcoal	75–100
Plant products	21.6
<b>Total</b>	<b>3,600</b>

### 3.3.1 Policies and Regulations

Namibia’s policy framework reflects a commitment to addressing IAS and promoting SU. The [Environmental Management Act \(2007\)](#) provides a comprehensive structure for managing natural resources sustainably, emphasizing the prevention and control of IAS. The [Nature Conservation Ordinance \(1996\)](#) and the [Forestry Act \(2001\)](#) complement these efforts by regulating wildlife utilization and ensuring the conservation of forest resources. Additionally, Namibia’s [Tourism Policy](#) integrates biodiversity conservation with tourism development, promoting SU by aligning economic activities with ecological goals.

A major policy initiative addressing IAS is the [National Biodiversity Strategy and Action Plan \(NBSAP\)](#), which outlines strategies for preventing, detecting, and managing IAS. The plan emphasizes cross-sectoral collaboration, the inclusion of Indigenous and local knowledge (ILK), and community participation. Despite these strong policy foundations, challenges remain in implementation, particularly in ensuring adequate financial and technical resources to monitor and manage IAS effectively.



### 3.3.2 Role of IAS in Ecosystem Degradation

Invasive alien species (IAS), such as *Prosopis* spp., have significantly degraded Namibia's ecosystems. Initially introduced for their drought resistance, *Prosopis* has spread uncontrollably, invading rangelands, reducing water availability, and threatening native species (Auala et al., 2014). [A 2020 study](#) estimated that *Prosopis* infestations cost Namibia's agricultural sector millions of Namibian dollars annually due to reduced grazing land and increased management costs. Beyond economic losses, IAS disrupt ecosystem functions, affecting water cycles, soil fertility, and native biodiversity. These impacts underscore the need for targeted IAS control measures integrated into broader conservation and SU strategies.



### 3.3.3 National Development Connection

[Namibia's Vision 2030](#) and successive [National Development Plans \(NDPs\)](#) highlight environmental sustainability as a cornerstone of economic growth and poverty reduction. Community-based natural resource management (CBNRM) has emerged as a model for integrating conservation and development. Through CBNRM, Namibia's 86 registered conservancies manage over 20% of the country's land, generating approximately N\$ 132 million (approx. \$7.07 million USD) annually from sustainable tourism, hunting, and other wildlife-based enterprises (Sources: [The State of community conservation in Namibia](#) and [Community conservation Facts in Namibia](#)). This approach not only conserves biodiversity but also creates employment and reduces poverty in rural areas.

However, IAS pose a direct threat to these achievements. For example, the encroachment of invasive plant species into conservancies reduces the availability of forage for wildlife, undermining the tourism potential and economic viability of these areas. Similarly, IAS impact Namibia's fisheries, forestry, and agricultural sectors, critical components of the country's economy and food security.



*Table 8: Overview of key economic sectors, their contributions to GDP, impacts of invasive alien species (IAS) and unsustainable use of wild species, and strategies to address in Namibia*

Sector	GDP Contribution	Economic Impact of IAS and UWSU	Mitigation Strategies
<b>Agriculture</b>	7.2%	Encroacher bush (e.g., bush encroachment) reduces grazing lands, affecting livestock production. Unsustainable grazing practices exacerbate land degradation. [Source: <a href="#">Namibia Nature Foundation, 2016</a> and (Shikangalah & Mapani, 2020) ]	Promoting land restoration programs and sustainable grazing management. [Source: <a href="#">Namibia National Planning Commission</a> ]
<b>Tourism</b>	10%	IAS threaten biodiversity, affecting tourism based on natural landscapes and wildlife. [Source: <a href="#">Namibian Invasive Alien Species Working Group (NIASWG)</a> and (Brown, 2008)]	Strengthening wildlife and ecosystem conservation programs. [Source: <a href="#">National Policy on Tourism for Namibia</a> and (Brown, 2008; Nanyeni, 2024)]
<b>Forestry</b>	2%	IAS reduce forest resources by altering ecosystems and limiting access to forest products. [Source: <a href="#">Conservation Namibia, 2022</a> , (Shilongo, 2013)]	Promoting sustainable forestry practices and IAS monitoring systems. [Source: <a href="#">Namibia Forestry Act, NIASWG</a> ]

### 3.3.4 Protected Areas and IAS Control

Namibia's protected areas (both terrestrial and marine zones; state-managed national parks, communal conservancies, and private game reserves), which cover approximately 42% of the country's land (Source: [Nature Needs Half](#)), play a vital role in biodiversity conservation and IAS control. Managed by the Ministry of Environment, Forestry, and Tourism (MEFT), these areas implement habitat restoration projects, monitor IAS, and support ecosystem resilience. Programs like the Integrated Management of Protected Areas emphasize community engagement, recognizing that the participation of Indigenous Peoples and local communities is essential for effective IAS management ([Namibia- Integrated Community-Based Ecosystem Management \(ICEMA\) Project](#)).

ILK has proven invaluable in identifying and controlling IAS. For instance, local communities have developed methods to utilize *Prosopis juliflora* for fuelwood and construction materials, reducing its spread while creating economic opportunities. Scaling up such initiatives, combined with scientific approaches, can enhance IAS management across Namibia's landscapes.

### 3.3.5 Future Directions and Projections

The future of IAS control and SU in Namibia lies in fostering inclusive, community-driven conservation initiatives that interweave ILK and scientific knowledge. Expanding Namibia's CBNRM program to





include explicit IAS management objectives can leverage the success of conservancies in balancing conservation and livelihoods. Additionally, investments in climate-smart agriculture and sustainable forestry practices can reduce reliance on degraded ecosystems, promoting long-term ecological and economic resilience.

Regional collaboration will be critical. Namibia is part of the [Southern African Development Community \(SADC\)](#), which has frameworks for transboundary IAS management. Strengthening partnerships with neighbouring countries can facilitate knowledge sharing, harmonize policies, and address IAS challenges in shared ecosystems, such as the [Kavango Zambezi Transfrontier Conservation Area \(KAZA TFCA\)](#). Additionally, notable examples of cross-border collaboration focused on invasive alien species (IAS): the [Orange-Senqu River Commission \(ORASECOM\)](#) initiative working to control invasive plants in the river basin, efforts by the [Permanent Okavango River Basin Water Commission \(OKACOM\)](#), and [Zambezi Watercourse Commission \(ZAMCOM\)](#), that also contribute indirectly to managing IAS and supporting sustainable use of wild species (SuA).

Public awareness campaigns, leveraging digital platforms, can also play a transformative role in mobilizing communities and stakeholders against IAS. These campaigns could emphasize the economic, social, and ecological benefits of controlling IAS and adopting SU practices.

Lastly, targeted funding and capacity-building initiatives are essential to empower Indigenous Peoples and local communities, researchers, and policymakers. By aligning conservation efforts with Namibia's development goals, the country can ensure that IAS control and SU not only conserve biodiversity but also enhance livelihoods and resilience to environmental change.



### BRIGHT SPOT

#### Namibia's Community-Based Natural Resource Management (CBNRM) Program

Namibia's CBNRM program is a leading example of how principles of sustainable use of wild species can drive both conservation and development. Covering nearly half of the country's land, the program has empowered over 83 conservancies to manage natural resources. These communities have seen tangible benefits, including:

- **Biodiversity Recovery:** Increased wildlife populations, such as elephants and lions, in conservancy areas.
- **Economic Gains:** Over 100 million Namibian dollars generated annually through eco-tourism, hunting, and natural resource use.
- **Improved Livelihoods:** Enhanced income and employment opportunities for rural communities.

This model has been globally recognized as a best practice for integrating conservation with community benefits, providing valuable lessons for managing IAS and scaling sustainable use practices.





## 3.4 Uganda

Uganda's wetlands and forests provide essential ecosystem services, including water regulation, pollination, and food provision, which directly support rural livelihoods (Namaalwa et al., 2013). Wild species, such as medicinal plants and

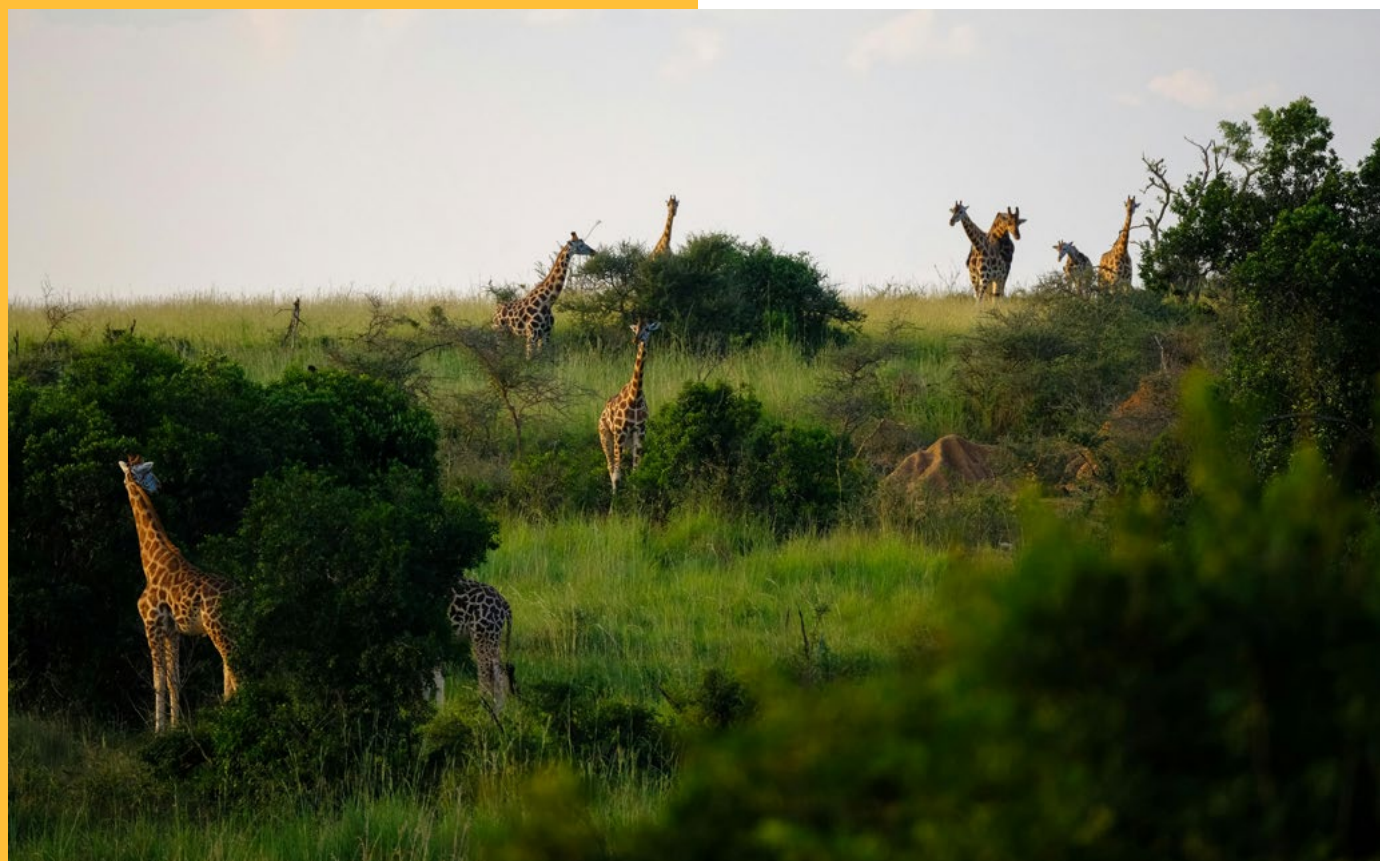
bushmeat, play critical roles in subsistence and trade (Harrison et al., 2015). Community-based initiatives, such as the Bigodi Wetland Sanctuary, illustrate the potential for ecotourism to conserve biodiversity while offering economic benefits (Gosling et al., 2017). However, agricultural expansion, unsustainable wild species use, and the spread of Invasive Alien Species (IAS), including water hyacinth (*Eichhornia crassipes*) and *Prosopis juliflora*, threaten the sustainability of these ecosystems. IPBES reports highlight that IAS degrade habitats, displace native species, and disrupt ecological functions, compounding pressures on Uganda's biodiversity (Roy et al., 2023). In Africa, the estimated annual cost of IAS to agriculture is \$65.58 billion (Fernandez et al., 2023).

**Area:** 241,038 km<sup>2</sup>

**Population:** 48.58 million (2023)

**Main Economic Sectors:** Agriculture (coffee, tea, tobacco, maize), services, and manufacturing

**Main Ecosystems:** Forests, savannas, and wetlands



*Table 9: Overview of key economic sectors in Uganda, their contributions to GDP, impacts of invasive alien species (IAS) and unsustainable use of wild species, and strategies to address*

Sector	GDP Contribution	Economic Impact of IAS and UWSU	Mitigation Strategies
<b>Agriculture</b>	24.2%	IAS like water hyacinth ( <i>Eichhornia crassipes</i> ) disrupt irrigation systems and affect crop yields. Unchecked land expansion leads to unsustainable practices. [Source: <a href="#">Oxfam Uganda, 2021</a> ]	Promotion of irrigation management and conservation agriculture techniques. [Source: <a href="#">Oxfam Uganda, 2021</a> ]
<b>Tourism</b>	7.7%	IAS affect biodiversity in national parks, threatening wildlife tourism which is an important part of Uganda's economy. [Source: <a href="#">World Bank, 2020</a> ]	Development of national parks and biodiversity conservation initiatives. [Source: <a href="#">Uganda Tourism Board, 2021</a> ]
<b>Forestry</b>	2.4%	Deforestation, driven by both IAS (e.g., <i>Lantana camara</i> ) and unsustainable logging, reduces ecosystem services like carbon sequestration and water regulation. [Source: (FAO & UNEP, 2020)]	Implementation of forest conservation policies and IAS monitoring systems. [Source: <a href="#">Uganda Forest Strategic Plan, 2020</a> ]



### 3.4.1 Policies and Regulations

Uganda's policy framework for biodiversity conservation includes the [National Environmental Management Policy \(1994\)](#) and the [National Environmental Act \(2019\)](#). These policies emphasize IAS control and optimizing the sustainable use of wild species. The [Forestry Policy \(2001\)](#) and [National Forest Plan \(2002\)](#) integrate IAS management into forest conservation, while the [National Development Plan \(NDP III, 2020/21–2024/25\)](#) underscores sustainable management of forests, wetlands, and water catchments. These align with international biodiversity goals, including the [Convention on Biological Diversity \(CBD\)](#) (UNDP, 2021).

### 3.4.2 International Commitments

Uganda is a signatory to several international agreements, including the CBD, Ramsar, and CITES, which guide its IAS and biodiversity conservation efforts. Despite these commitments, insufficient data and resource constraints pose challenges to meeting comprehensive reporting requirements. Strengthening





national capacity to fulfil international obligations is critical for effective IAS management and conservation (W. IPBES, 2019; Roy et al., 2023).

### 3.4.3 National Development Connection

[Uganda's Vision 2040](#) positions environmental sustainability as a foundation for economic growth. Sustainable use of wild species is integral to poverty reduction and food security, while ecosystem restoration contributes to climate resilience. Linking biodiversity strategies to national development goals ensures that conservation efforts address both environmental and socio-economic priorities. Initiatives like ecotourism in Bwindi Impenetrable National Park exemplify how biodiversity conservation can generate economic benefits for local communities (Namaalwa et al., 2013).

### 3.4.4 Protected Areas and IAS Control

Protected areas, managed by the Uganda Wildlife Authority (UWA) and Uganda Forestry Authority (UFA), are critical for conserving biodiversity. Challenges from invasive alien species, such as *Parthenium hysterophorus* (famine weed) in drylands and *Pistia stratiotes* (water lettuce) in freshwater systems, necessitate comprehensive management strategies. Efforts include monitoring, restoration of affected ecosystems, and community-based models that integrate climate-smart conservation practices. Regional collaboration, particularly through the East African Community (EAC), strengthens cross-border IAS management, benefiting ecosystems like the Lake Victoria Basin.



### 3.4.5 Future Directions and Projections

To enhance IAS management and promote ecosystem resilience in Uganda, the following strategies could be considered:

- **Policy Development:** Formulate and adopt integrated IAS management frameworks to align national priorities with regional and international commitments.
- **Capacity Building:** Strengthen human and institutional capacities through targeted training programs and resource mobilization, ensuring effective IAS management and biodiversity conservation.
- **Community-Based Monitoring:** Expand community-driven monitoring systems that leverage Indigenous and local knowledge (ILK) alongside scientific methods to enhance biodiversity management and restoration efforts.
- **Climate-Smart Restoration:** Integrate climate-adaptive strategies into restoration programs to counter the impacts of IAS and promote ecosystem resilience under changing climatic conditions.
- **Research and Data Collection:** Invest in research to address knowledge gaps regarding IAS distributions and impacts while improving data collection for informed decision-making.
- **Regional Cooperation:** Foster regional partnerships to address transboundary IAS challenges, share innovative practices, and strengthen policy harmonization for biodiversity conservation.

By implementing these strategies, Uganda can effectively mitigate IAS impacts, build resilient ecosystems, and achieve sustainable development goals while conserving its rich biodiversity.



#### BRIGHT SPOT

### Community-Driven Conservation and Ecotourism in Uganda

In Uganda, community-based conservation initiatives are transforming local economies while preserving biodiversity. The Bigodi Wetland Sanctuary, a community-managed ecotourism site, showcases how wetlands conservation can support biodiversity while offering sustainable livelihoods through guided tours and local craft sales. Similarly, the Bwindi Impenetrable National Park integrates conservation with community benefit by promoting ecotourism that generates income for local communities. These efforts include restoring affected ecosystems, monitoring biodiversity, and adopting climate-smart conservation practices. Cross-border collaboration through the East African Community (EAC) enhances IAS management, particularly in shared ecosystems like the Lake Victoria Basin, ensuring long-term ecological and economic benefits.





## 3.5 Tanzania

Invasive Alien Species (IAS) in Tanzania pose significant threats to biodiversity, human health, and the economy (Munishi & Ngondya, 2022). With 75 identified invasive species and 145 potential invasive species, the country faces severe risks to crops, pastures, water resources, and critical ecosystems. Annual economic losses from IAS are estimated between US\$ 155.6–190 million in mixed maize farming systems alone, while national parks and the Ngorongoro Conservation Area Authority (NCAA) spend over 1 billion TZS (approx. \$392,000) annually on IAS control (Bukombe et al., 2021; URT, 2019). Factors such as international trade, climate change, and unsustainable land-use practices exacerbate these challenges (IUCN, 2021). Compounding the problem is insufficient awareness, regulatory gaps, and limited resources for IAS management (Lyimo et al., 2009).

**Area:** 945,203 km<sup>2</sup>

**Population:** 67.44 million (2023)

**Main Economic Sectors:** Agriculture (coffee, tea, tobacco, maize), mining (gold, diamonds), and tourism

**Main Ecosystems:** Forests, savannas, and coastal regions

### 3.5.1 Policies and Regulations

Tanzania's National Invasive Species Strategy and Action Plan (NISSAP, 2019–2029) (URT, 2019) provides a comprehensive framework for IAS management with six strategic objectives:

- **Prevent Introduction and Spread of New IAS:** Strengthen inspections, risk assessments, and border control.
- **Reduce Impacts of Existing IAS:** Reduce the abundance of priority IAS by 50% and restore 50% of ecosystems affected by IAS.
- **Enhance National Capacity:** Secure funding, increase IAS research, and integrate management into academic and research institutions.
- **Raise Awareness and Promote Participation:** Prioritize community education and stakeholder involvement through behaviour change programs.
- **Mainstream IAS Management:** Embed IAS control in government, private sector, and local development plans.
- **Augment Collaboration and Coordination:** Develop transboundary partnerships and a national stakeholder coordination framework (URT, 2019).





The [Environmental Management Act \(EMA, 2004\)](#) serves as the overarching regulatory framework for environmental management and IAS control, coordinated under the Vice President's Office.

### 3.5.2 International Commitments

Tanzania's IAS management strategy aligns with key international treaties such as the [Convention on Biological Diversity \(CBD\)](#), the [International Plant Protection Convention \(IPPC\)](#), and the [Ramsar Convention on Wetlands](#). These agreements promote compliance with global biodiversity goals and provide access to capacity-building and knowledge-sharing initiatives. The country also participates in regional collaborations, such as through the [East African Community \(EAC\)](#), which enhances cross-border cooperation for managing IAS in shared ecosystems like the Lake Victoria Basin (Bukombe et al., 2021).

*Table 10: Sectoral GDP Contributions, Economic Impacts of Invasive Alien Species (IAS) and Unsustainable Wild Species Use, and Mitigation Strategies in Tanzania*

Sector	GDP Contribution	Economic Impact of IAS and UWSU	Mitigation Strategies
<b>Agriculture</b>	28.7%	IAS impact crop and livestock production, leading to reduced agricultural output. Unsustainable practices like overgrazing also contribute to land degradation. [Source: <a href="#">FAO (2020)</a> (Macha, 2021)]	Support for sustainable agricultural practices and farmer education on IAS management. [Source: <a href="#">National Invasive Species Strategy and Action Plan (NISSAP) 2019-2029</a> ]
<b>Forestry</b>	4%	IAS and unsustainable logging degrade forest resources, leading to a loss of timber and non-timber forest products. [Source: <a href="#">FAO</a> and <a href="#">TANAPA, 2017</a> ]	Reforestation programs and promotion of sustainable forest management practices. [Source: <a href="#">National Forest Policy Implementation Strategy (2021- 2031)</a> ]
<b>Tourism</b>	8.5%	IAS threaten biodiversity and habitats, affecting tourism in national parks and wildlife reserves. [Source: <a href="#">TANAPA, 2017</a> and <a href="#">NISSAP 2019-2029</a> ]	Strengthening wildlife conservation programs and IAS control strategies. [Source: <a href="#">Tanzania National Parks (TANAPA) Guidelines for Invasive Alien Species Management, 2017</a> ]

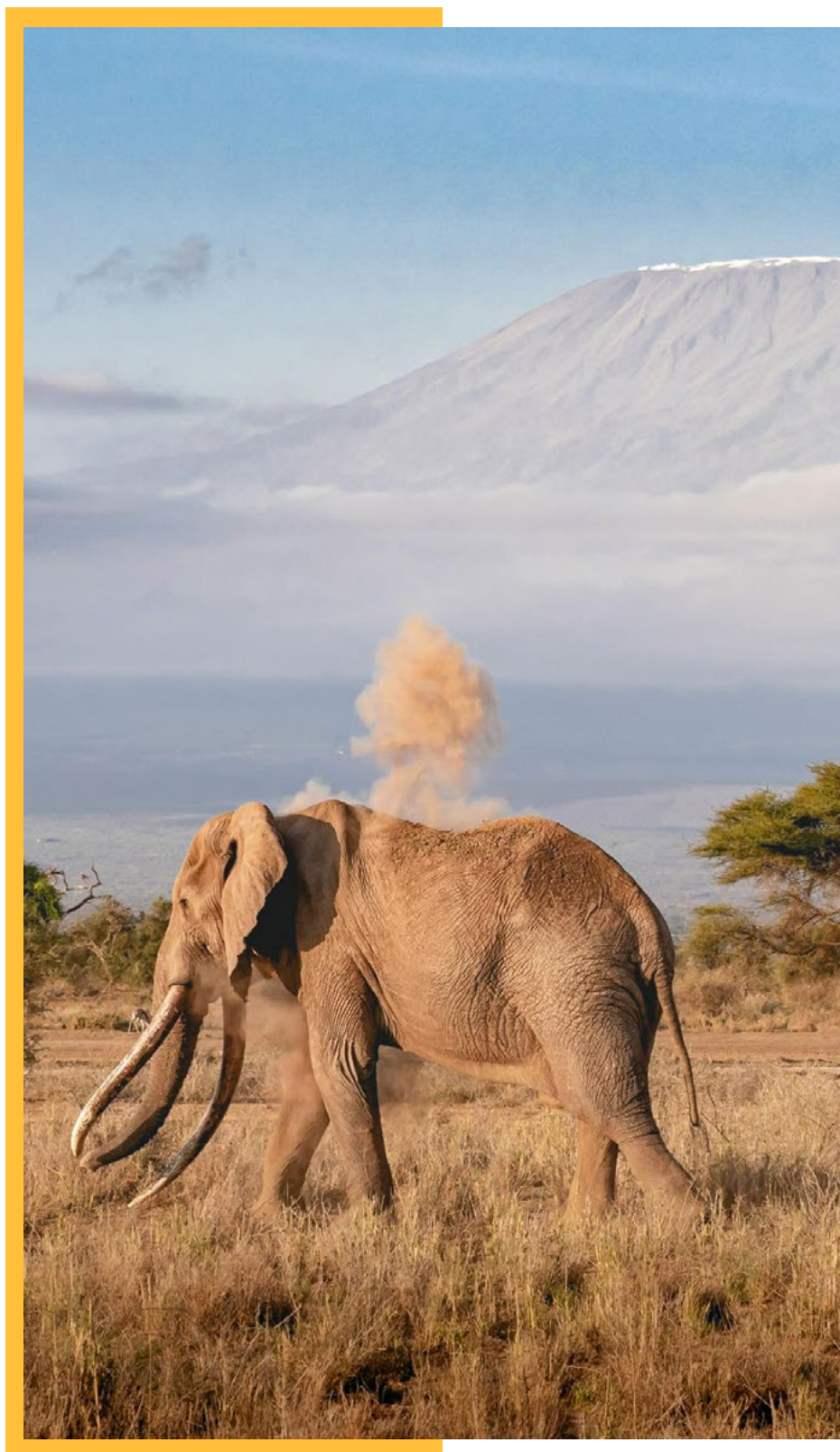


### 3.5.3 National Development Connection

IAS management is integral to Tanzania's [National Development Vision 2025](#), addressing key economic sectors such as agriculture, tourism, and water resources. The [NISSAP](#) highlights the connection between sustainable IAS control and long-term economic resilience, particularly for rural communities dependent on biodiversity. Restoration of ecosystems degraded by IAS contributes to food security, climate resilience, and sustainable development (URT, 2019).

### 3.5.4 Protected Areas and IAS Control

Protected areas, including Serengeti National Park and the Ngorongoro Conservation Area, are essential for biodiversity conservation. IAS control in these areas focuses on mapping, restoration projects, and monitoring programs, despite high implementation costs. [Tanzania National Parks \(TANAPA\)](#) and the [Ngorongoro Conservation Area Authority \(NCAA\)](#) play pivotal roles in these efforts, emphasizing community involvement in ecosystem restoration projects to ensure sustainable land-use practices (Bukombe et al., 2021).



### 3.5.5 Future Directions and Projections

To enhance IAS management and promote sustainable use of biodiversity, Tanzania can consider the following strategies:

- **Community-Based Conservation:** Expand initiatives that support community participation and blend Indigenous and local knowledge with scientific approaches to address IAS threats. Empowering local communities will enhance biodiversity conservation and ensure sustainable wild species use, as outlined in the National Invasive Species Strategy and Action Plan ([NISSAP](#)).
- **Regional Collaboration:** Strengthen partnerships with neighbouring countries to harmonize IAS management strategies, share knowledge, and address transboundary challenges. This collaborative approach aligns with Tanzania's commitments under regional frameworks.
- **Adaptive Management:** Invest in adaptive management practices to mitigate the effects of climate change on ecosystems, ensuring the resilience of biodiversity and local livelihoods.
- **Capacity Building and Resource Allocation:** Enhance technical and institutional capacities through training and the allocation of resources to effectively implement NISSAP priorities.
- **Research and Monitoring:** Prioritize research on the distribution and ecological impacts of IAS to facilitate informed decision-making and promote sustainable use of wild species.

By implementing these strategies, Tanzania can build on the NISSAP framework to mitigate the impacts of IAS, ensure ecosystem resilience, and achieve sustainable development goals in harmony with biodiversity conservation (URT, 2019).



#### BRIGHT SPOT

##### Community-Led IAS Management in Tanzania

Tanzania's National Invasive Species Strategy and Action Plan (NISSAP) emphasizes community-driven conservation to tackle invasive alien species. Initiatives include adaptive management practices addressing climate impacts and enhanced regional collaboration for cross-border IAS threats. Through this approach, local communities play a pivotal role in restoring ecosystems while securing livelihoods. Lessons from NISSAP implementation provide a roadmap for fostering ecosystem resilience and well-being.







## 3.6 Zimbabwe

Zimbabwe, home to diverse ecosystems, including savannahs, wetlands, and montane forests, holds immense biodiversity. This biodiversity underpins not only its natural heritage but also its cultural identity and economic development. As

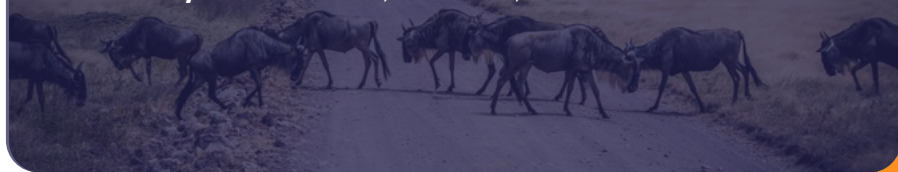
the country faces pressures on its natural resources, ensuring the sustainable use (SU) of these wild species has become crucial for long-term environmental health and human well-being. However, like many other countries, is confronted by significant challenges, particularly from the spread of invasive alien species (IAS), which threaten its ecosystems and agricultural productivity. This situation requires comprehensive strategies involving scientists, policymakers, environmental organizations, and local communities. Collaborative efforts are needed to manage IAS and ensure the sustainable use of wild species, aligning these goals with the country's developmental objectives. These efforts should be underpinned by research and policy initiatives, such as the [National Biodiversity Strategy and Action Plan \(NBSAP\)](#), [national development frameworks](#), and international assessments like those from IPBES.

**Area:** 399,757 km<sup>2</sup>

**Population:** 16.67 million (2023)

**Main Economic Sectors:** Agriculture (tobacco, maize, cotton), mining (gold, platinum), and manufacturing

**Main Ecosystems:** Forests, savannas, and wetlands



### 3.6.1 Role of IAS in Ecosystem Degradation

As earlier mentioned, Zimbabwe's ecosystems are increasingly threatened by Invasive Alien Species (IAS), which disrupt native biodiversity, alter habitats, and impact agricultural productivity. Notable examples include:

- ***Lantana camara*:** This terrestrial invasive plant has the widest distribution across the country, encroaching on various habitats and outcompeting native flora.
- ***Acacia mearnsii*:** Predominantly found in the mist belts of the Eastern Highlands, this species has aggressively occupied more than 200,000 hectares, including Key Biodiversity Areas (KBAs) and Important Bird and Biodiversity Areas (IBAs) in regions like Nyanga, Vumba, Chirinda, and Chimanimani.
- ***Pinus patula*:** In the Eastern Highlands, this species has encroached on over 100,000 hectares of land, impacting montane grasslands and associated ecosystems.
- **Fall Armyworm (*Spodoptera frugiperda*) and Large Grain Borer (*Prostephanus truncatus*):** These invasive species are among the most widespread affecting agriculture, leading to significant crop losses and threatening food security. ([Birdlife Zimbabwe](#) and (Mujaju et al., 2021))



The economic impact of these invasions is substantial. Zimbabwe allocates approximately USD 50 million annually to combat invasive alien plant species, underscoring the significant threat they pose to agriculture, health, biodiversity, and ecosystem services ([FAO](#) and [NISSAP](#)).

### 3.6.2 Policies and Regulations

Zimbabwe has established a policy framework to address IAS and promote sustainable use:

- [Environmental Management Act \(Chapter 20:27\)](#): Mandates the Environmental Management Agency (EMA) to investigate and manage IAS, providing a legal basis for environmental protection and sustainable wild species use.
- [National Biodiversity Strategy and Action Plan \(NBSAP\) 2014-2020](#): Outlines strategies for biodiversity conservation, including IAS management and the promotion of sustainable practices.
- [Forests Act \(Chapter 19:05\)](#): Includes provisions for managing invasive plant species, particularly in protected areas.

Despite these policies, challenges such as limited funding and technical capacity hinder full implementation. To address these issues, the [Food and Agriculture Organization \(FAO\)](#) is providing technical assistance to strengthen national capacity for managing IAS in Zimbabwe, which includes capacity building for extension service providers on IAS management, as outlined in the [NISSAP](#).



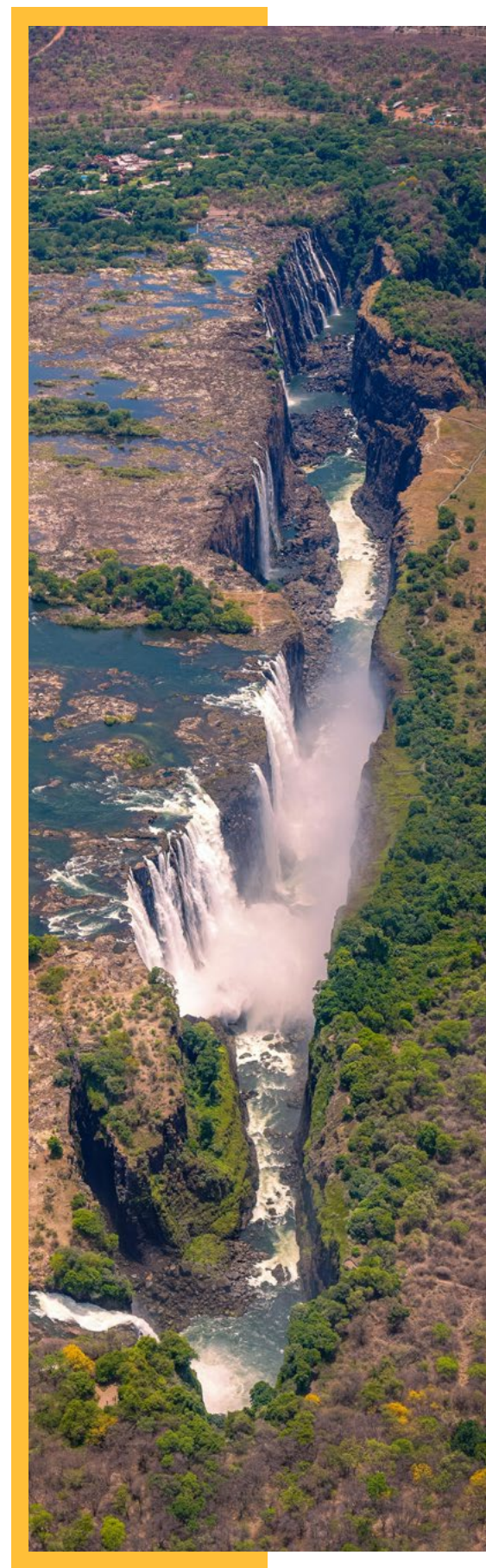


### 3.6.3 National Development Connection

Zimbabwe's [National Development Strategy 1 \(2021-2025\)](#) underscores the vital link between environmental sustainability and economic growth. A critical component of this strategy is the sustainable use of wild species, which is essential for maintaining biodiversity, supporting livelihoods, and ensuring ecosystem resilience. IPBES SU report (Fromentin et al., 2022) highlights the importance of sustainable use of wild species in achieving global biodiversity targets. Their assessments provide valuable insights into policy options and management practices that can enhance sustainability and mitigate the impacts of invasive species.

However, invasive alien species (IAS) pose significant threats to these objectives, impacting key sectors of the economy and the environment (CBD Country Profile-Zimbabwe, and (Mujaju et al., 2021)):

- **Agriculture:** Invasive pests such as the fall armyworm (*Spodoptera frugiperda*) have caused substantial crop damage, reducing yields and affecting farmers' incomes. This pest has been particularly detrimental to staple crops like maize, threatening food security and economic stability in rural communities.
- **Tourism:** Species such as *Acacia mearnsii* encroach upon protected areas, diminishing the natural beauty and ecological integrity of tourist destinations. This invasion can lead to a decline in biodiversity, affecting wildlife viewing opportunities and potentially reducing tourism revenue, which is a vital source of foreign exchange and employment.
- **Water Resources:** Invasive plants like *Acacia mearnsii* consume significant water quantities, decreasing availability for agriculture and human use, and disrupting hydrological cycles. This can exacerbate water scarcity issues, particularly in arid regions, and increase the costs of water treatment and management.
- **Biodiversity and Ecosystem Services:** Invasive alien species are among the greatest drivers of biodiversity loss in Zimbabwe. Their proliferation leads to habitat destruction, threatening numbers of highly important species, such as medicinal plants, and disrupting ecosystem functions that support agriculture, fisheries, and other human activities.





Addressing these challenges requires integrated biodiversity management and IAS control strategies, as outlined in [Zimbabwe's National Biodiversity Strategy and Action Plan \(NBSAP\)](#). The NBSAP emphasizes the need for sustainable use practices that balance human needs with conservation objectives, ensuring that wild species are utilized in ways that do not compromise their long-term viability. Implementing effective IAS management not only conserves biodiversity but also supports sustainable development and poverty alleviation. By protecting the natural resources that underpin key economic sectors, Zimbabwe can promote resilience against environmental challenges and ensure the well-being of its people.

### 3.6.4 Protected Areas and IAS Control

Zimbabwe's protected area network, covering approximately 28.2% of the country, plays a critical role in biodiversity conservation and IAS management ([Zimbabwe Biodiversity Economy](#)). Initiatives led by the Ministry of Environment, Climate, Tourism, and Hospitality Industry include habitat restoration and invasive species removal, particularly in areas like Nyanga National Park and Chimanimani National Park. These areas face significant threats from invasive species:

- **Chimanimani National Park:** Reports indicate the presence of various introduced and invasive species, necessitating targeted management strategies to preserve its unique biodiversity ([Global Biodiversity Information Facility network](#)).
- **Nyanga National Park:** Invasion by species like *Pinus patula* has altered native ecosystems, requiring ongoing efforts for habitat restoration and invasive species control ([Birdlife Zimbabwe](#)).



#### BRIGHT SPOT

#### Successful Community-Driven Control of *Lantana camara* in Masvingo Province

A noteworthy success in managing IAS in Zimbabwe comes from the collaboration between local communities and the Environmental Management Agency (EMA) to control the invasive plant *Lantana camara* in Masvingo Province. By integrating Indigenous and local knowledge (ILK) with scientific methods, the community developed an effective approach for eradicating this harmful species. Local knowledge on traditional plant management, combined with modern ecological practices, has led to a significant reduction in the spread of *Lantana camara*, allowing native vegetation to regenerate. This community-driven initiative not only demonstrated effective biodiversity conservation but also enhanced local stewardship over environmental resources but foster local capacity, leveraging Indigenous and local knowledge and mainstreaming gender.



### 3.6.5 Future Directions and Projections

To enhance IAS management and promote sustainable use of wild species, Zimbabwe can consider the following strategies:

- **Policy Enhancement:** Review and update the National Biodiversity Strategy and Action Plan (NBSAP) to prioritize IAS management, as emphasized in the global and regional IPBES assessments.
- **Capacity Building:** Strengthen technical capacities for IAS management through training programs and resource allocation, as supported by international organizations. This is key to ensuring the sustainable management of wild species.
- **Community Engagement:** Expand community-based initiatives that blend Indigenous and local knowledge (ILK) with scientific approaches. Empowering local communities can improve both biodiversity conservation and sustainable resource use, as highlighted by [Zimbabwe's National Agriculture Policy Framework \(NAPF\)](#).
- **Research and Monitoring:** Invest in research to understand the distribution and ecological impacts of IAS, facilitating informed decision-making that aligns with effective management strategies and principles for sustainable use of wild species.
- **Regional Collaboration:** Engage in regional partnerships to harmonize policies, share best practices, and address transboundary challenges posed by IAS. Regional collaboration supports the sustainable use of wild species and can drive conservation efforts that benefit multiple countries.

By implementing these strategies, Zimbabwe can mitigate the impacts of Invasive Alien Species, ensure the sustainable use of its wild species, and achieve its development goals in harmony with environmental conservation.



*Table 11: Sectoral Contributions to GDP and Impacts of Invasive Alien Species (IAS) and Unsustainable Use of Wild Species, and the mitigation strategies in place to address these challenges.*

Sector	GDP Contribution	Economic Impact of IAS and UWSU	Mitigation Strategies
Agriculture	8.6%	IAS reduce productivity and contribute to soil degradation, affecting staple crops like maize. Unsustainable practices exacerbate land degradation. [Source: (FAO & UNEP, 2020)]	<a href="#">FAO</a> is providing technical assistance to strengthen national capacity for IAS management. (FAO & UNEP, 2020)
Forestry	4%	Deforestation and IAS (e.g., invasive plants like <i>Lantana camara</i> ) reduce forest resources, impacting timber and fuelwood supply. Source: (FAO, 2020)	Promotion of sustainable forestry practices and IAS monitoring. [Source: <a href="#">Zimbabwe National Forestry Policy, 2019</a> ]
Tourism	6%	Loss of biodiversity and wildlife habitats due to IAS affects tourism, particularly wildlife-based tourism. [Source: (Mutanga et al., 2021)]	Development of biodiversity conservation programs to protect ecosystems and attract tourists.

## Knowledge and Evidence Gaps in IAS Management

Invasive alien species (IAS) and Sustainable Use of wild species (SU) are undoubtedly critical and related global challenges, warranting an adoption of nature-based approaches (NbA) (Ngondya & Munishi, 2022). To address these interconnected issues, it requires combined effort of interweaving Indigenous and local knowledge (ILK) with scientific methods (e.g. use of drones, GIS, and AI), and policy frameworks to fill key knowledge gaps integrating evidence into-action. Insights from regional and global assessments highlight the following areas for action:

### 1. Knowledge Gaps in Policy and Governance

Current governance systems often fail to integrate socioecological factors, limiting holistic solutions (Fromentin et al., 2022; McGeoch et al., 2024). For example, Kavango-Zambezi (KAZA) region lack adequate platforms for sharing data on IAS spread and management of IAS like *Prosopis juliflora* in East Africa is inadequate, a clear indication of how frameworks linking IAS





control with SU are underdeveloped. Emerging technologies like drones and GIS remain underutilized due to insufficient policy support (Fromentin et al., 2022; Priyadarshini & Bundela, 2023; Roy et al., 2023). Additionally, Economic tools like subsidies for IAS control and SU practices could incentivize private-sector involvement but are largely unexplored.

### Opportunities for Action

Promote interdisciplinary research to develop governance systems that effectively integrate IAS and SU.

- Create platforms to reduce barriers to knowledge-sharing and encourage cross-border collaboration can address both IAS management and sustainable use of wild species concerns.
- Explore economic instruments by establishing targeted incentives such as subsidies, to engage innovators and private-sector in IAS control and promote practices for sustainable use of wild species.
- Enhance regional coordination in ecosystems like the Zambezi River Basin to manage biodiversity and SU collectively

### 2. Limited Data on IAS Trends and Pathways and Sustainable Use of Wild Species

The introduction and spread of invasive alien species (IAS) remain largely undocumented, particularly at finer scales, complicating prevention efforts. For example, the spread of the fall armyworm (*Spodoptera frugiperda*) across Southern Africa is inadequately tracked, hindering the design of effective management strategies (McGeoch et al., 2024; Seebens et al., 2023). Despite its widespread impact, detailed region-specific data on IAS are scarce, making it difficult to implement timely, targeted interventions. At the same time, Sustainable Use (SU) of wild species remains a critical area for biodiversity conservation and human well-being. For example, the use of invasive alien species like the Nile perch (*Lates niloticus*) in Lake Victoria has been a topic of discussion, with diverse viewpoints in its ecological impact, and it meeting the needs of local communities (Seebens et al., 2023). However, such information is not adequately documented, particularly in terms of ecological and socio-economic implications for Indigenous People and local communities. In many community-managed areas, data gaps hinder understanding of IAS impacts on communities and their livelihood and practices, particularly in coastal and wetland ecosystems. For instance, in Malawi and Botswana, the effects of IAS on community-managed wetlands are not well-documented, and there is limited documentation on how sustainable use practices are contributing to or mitigating the spread of IAS (Seebens et al., 2023).



### Opportunities for Action

- Invest in fine-scale research to document IAS pathways and trends.
- Support and strengthen co-created (with communities) research on SU in community managed areas to balance conservation and livelihoods.
- Establish centralized databases to support IAS and SU management.
- Prioritize research in transboundary ecosystems like KAZA and Lake Victoria.

### 3. Indigenous Knowledge and Participation

In general, there is a lack of mechanisms for sharing knowledge on IAS management amongst communities, scientists and policymakers (McGeoch et al., 2024). Indigenous and local knowledge (ILK) remains under-documented and insufficiently integrated into invasive alien species (IAS) management, even though Indigenous-managed lands host a significant proportion of established alien species (Seebens et al., 2023). Documentation of IAS trends on Indigenous lands is sparse, delaying timely interventions and increasing management costs. This gap limits collaborative efforts and sustainable practices, such as the use of invasive species for local economic activities. Additionally, the absence of equitable knowledge-sharing systems further constrains collaborative governance, despite the guidelines provided by the Nagoya Protocol (Garnett et al., 2018). Understanding Indigenous Peoples and local communities' on-the-ground experiences and mapping stakeholder interactions could improve governance systems and community participation (IPBES, 2023). Yet, regionally, there is limited research on community strategies for addressing IAS, which hinders the integration of their sustainable resource-use practices into broader management frameworks.





## Opportunities for Action

- Co-develop frameworks that blend Indigenous and local knowledge (ILK) with scientific methods fostering collaboration between communities, scientists and policymakers to create equitable governance.
- Establishing Indigenous and local knowledge-sharing mechanisms in line with the principle Free, Prior and Informed Consent and in accordance with the Indigenous data sovereignty and with full respect to (communal and individual) intellectual property rights and aligning with protocols like the [Nagoya Protocol](#) Knowledge sharing could be promoted between and Indigenous Peoples and local communities, and cross knowledge exchange with policy makers and scientists.
- Support and highlight community-led restoration projects as models for integrating IAS management with SU. For example in ecosystems like Malawi's wetlands (Lilongwe University of Agriculture and Natural Resources, 2024) and Uganda's sacred groves (Gosling et al., 2017) to strengthen local stewardship.
- Interweaving ILK and SU principles into regional governance frameworks, like the [SADC Biodiversity Strategies](#), can address IAS and promote ecological and socio-economic sustainability.

## 4. Practical Implementation Challenges

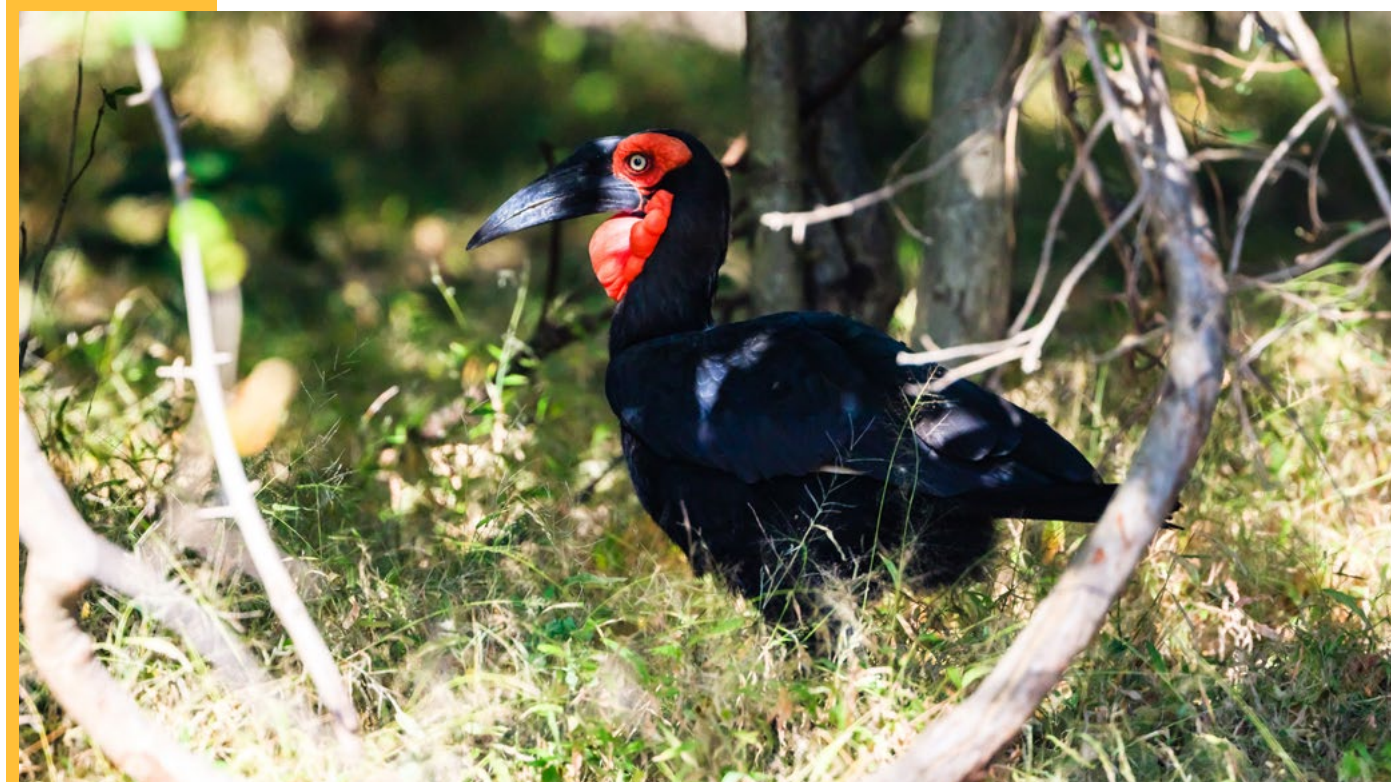
Governance models often fail to address local socioecological contexts, limiting IAS management effectiveness, particularly in transboundary systems such as the [Kavango Zambezi Transfrontier Conservation Area \(KAZA\)](#) (B. IPBES, 2019). Regionally, governance frameworks seldom address how practices of sustainable use of wild species can complement IAS control especially where livelihoods are closely tied to resource availability. Consequently, capacity gaps in funding and technical expertise exacerbate these challenges. Existing management frameworks often lack adaptation to local conditions, which can unlock opportunities for sustainable use of wild species (McGeoch et al., 2024). For example, in Namibia's arid ecosystems, IAS control methods are not designed to harness these species' potential for sustainable use of wild species, such as bioenergy production or fodder for livestock. This mismatch reduces the effectiveness of interventions and overlooks opportunities to benefit local communities.

## Opportunities for Action

- Allocate resources for capacity building in IAS monitoring and SU integration. By incorporating SU strategies into management initiatives, communities can derive tangible benefits, making IAS management more inclusive and impactful.
- Adapt IAS management tools to local socioecological contexts for greater impact, especially in regions with diverse socioecological conditions.
- Strengthen regional collaboration like ([KAZA](#)) to address shared IAS and SU challenges across borders, encouraging shared learning and joint solutions.







*Table 12: Summary Opportunities for Bridging Knowledge Gaps*

Action	Global Context	Regional Context
Enhancing pathway from research to impact	Bridge evidence-to-action gaps by enhancing technical assistance	Increase technical capacity and support from public, private, and civil society actors and partners
Enhancing Research	Foster interdisciplinary research for IAS governance.	Collaborate with IPLCs and researchers to design frameworks for ecosystems like <a href="#">KAZA</a> .
Empowering Indigenous and local communities	Blend Indigenous and local knowledge into IAS strategies.	Highlight IPLC-led projects such as wetland restoration in Malawi.
Strengthening Multi-level Collaboration	Use transboundary networks to share knowledge globally.	Align with <a href="#">SADC</a> Biodiversity Strategies to improve regional cooperation.
Building Capacity	Leverage Indigenous and local communities' IAS monitoring strategies and train them on new approaches.	Increase resources for IAS programs in Malawi and Zimbabwe.
Develop data-sharing tools	Create tools for global IAS data-sharing.	Establish IAS monitoring databases across <a href="#">SADC</a> and <a href="#">EAC</a> countries.



## 4. STAKEHOLDER ENGAGEMENT AND INDIGENOUS AND LOCAL KNOWLEDGE

Effective management of Invasive Alien Species (IAS) and the sustainable use of wild species (SU) requires collaboration across diverse stakeholder groups (Fromentin et al., 2022; Roy et al., 2023). By working together, these groups can make decisions that are inclusive and locally relevant while drawing on the invaluable insights of Indigenous and local knowledge (ILK). Such approaches are essential for fostering community ownership, enhancing conservation outcomes, and ensuring that policies align with local needs and priorities (W. IPBES, 2019; McElwee et al., 2020).

### 4.1 Stakeholder Groups and Roles

Key stakeholder groups involved in IAS management and SU include:

- **National Governments:** Responsible for setting policies, implementing laws, and coordinating cross-sectoral initiatives.
- **Local Communities:** Provide on-the-ground knowledge and play a pivotal role in monitoring and managing natural resources sustainably.
- **Indigenous Peoples:** Custodians of traditional practices, offering insights into ecosystem dynamics and sustainable use of wild species.
- **Private Sector:** Supports innovation, capacity building, and financing for IAS control and SU initiatives.
- **Academia and Research Institutions:** Conduct research on IAS impacts, provide data for evidence-based decisions, and develop innovative management techniques.
- **Regional Bodies and International Organizations:** Promote collaboration across borders and ensure alignment with global conservation goals.





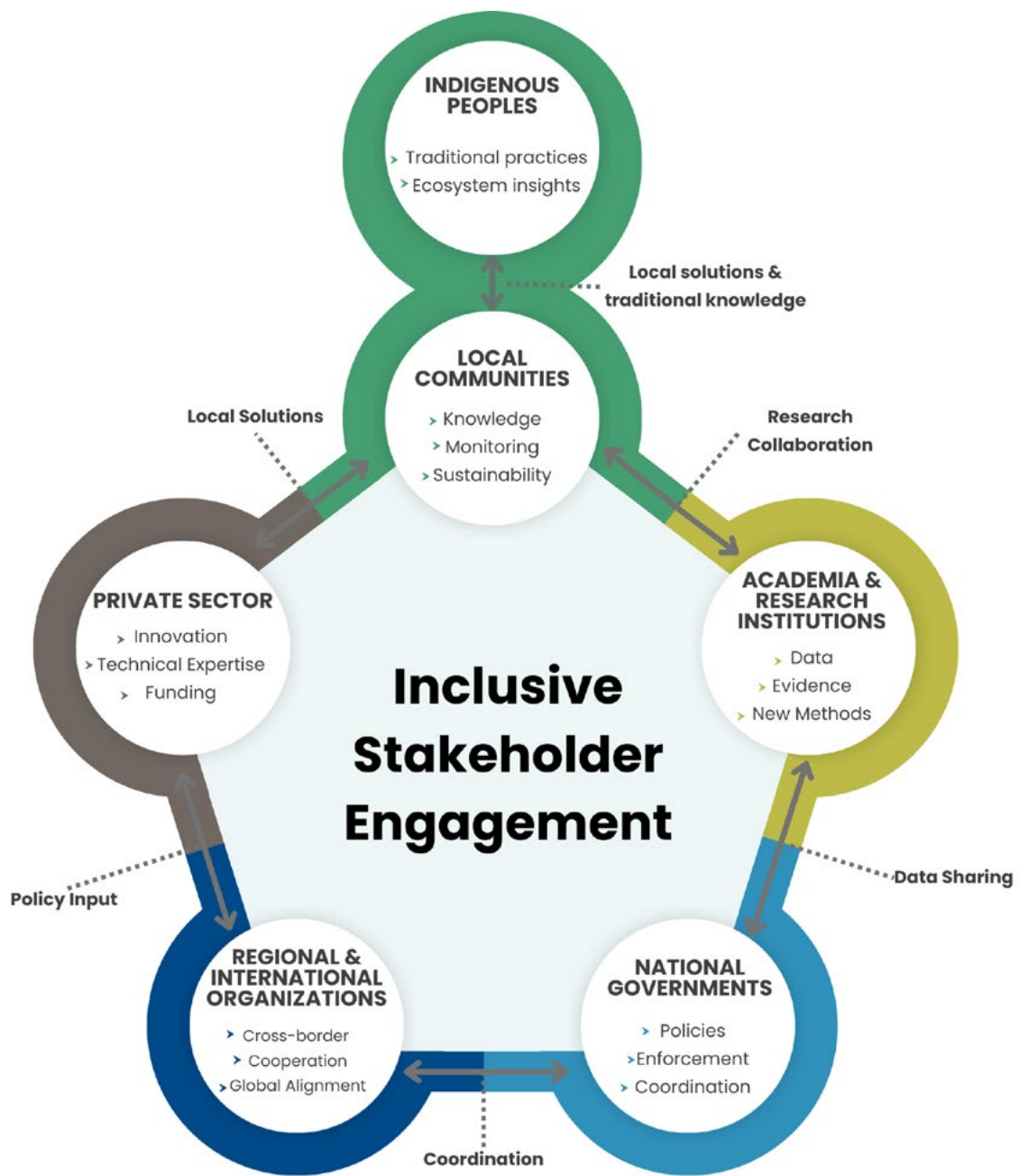


Figure 4.0.1: Conceptual framework highlighting the interconnected roles of diverse stakeholders in managing invasive alien species (IAS) and supporting sustainable use (SU) of wild species, emphasizing collaborative efforts among governments, Indigenous Peoples, local communities, private sector, academia, and regional organizations without prescribing specific approaches.





## 4.2 Role of Indigenous local knowledge (ILK) in Invasive Alien Species (IAS) and Sustainable Use of wild species (SU) Management

Indigenous and local knowledge (ILK) enhances IAS and SU management by offering context-specific insights that complement scientific approaches. Examples include:

- **Traditional grazing practices** in Botswana that mitigate the spread of invasive species (Esposito et al., 2020; Republic of Botswana, 2017).
- **Seasonal fishing bans** in Malawi that align with ecological cycles, promoting sustainable fisheries (Kambewa & Chiwaula, 2010; Tran et al., 2022).
- **Restoration efforts** led by Indigenous communities in Uganda, interweaving cultural values with ecosystem health (Egeru, 2012; Mukasa, 2014; Namaalwa et al., 2013).

ILK fosters holistic conservation approaches by addressing social, cultural, and environmental dimensions of biodiversity management (B. IPBES, 2019; IPBES, 2023).

## 4.3 Challenges and Opportunities

### 4.3.1 Challenges

- **Limited Representation:** Indigenous Peoples and local communities are often underrepresented in decision-making processes.
- **Knowledge Gaps:** Lack of documentation and blending of ILK into formal frameworks hinders its full potential.
- **Resource Constraints:** Financial and technical limitations affect stakeholders' ability to participate effectively.



### Integration of Indigenous Futures Thinking in Nexus Assessment

The Indigenous Futures Thinking Dialogue, led by the African Biodiversity Network and partners in Benin, Kenya, and Ethiopia, offers a participatory approach to strengthening Indigenous Peoples' governance and resilience against biodiversity loss and climate change. Using eco-cultural mapping and intergenerational knowledge transfer, the dialogues helped communities envision pathways for the conservation of critical ecosystems, revitalization of customary laws, and sustainable resource use. These examples illustrate how ILK can complement scientific methods, offering holistic solutions for regional challenges.

### Lessons and Regional Relevance

The dialogue aligns with the East and Southern Africa Regional Trialogue by:

- Emphasizing participatory tools like eco-cultural mapping for sustainable development.
- Revitalizing customary laws and conflict resolution mechanisms.
- Valuing intergenerational knowledge transfer for resilience.

### 4.3.2 Opportunities

- **Capacity Building:** Strengthening ILK holders' participation through training and resource allocation.
- **Policy Integration:** Including ILK into national biodiversity strategies and action plans (NBSAPs).
- **Technology and Knowledge Sharing:** Using digital tools to document ILK and share it with broader stakeholder groups.

### 4.4 Future Directions and Suggestions

- **Foster Inclusive Engagement:** Governments and conservation agencies could establish platforms to encourage equitable participation among stakeholders, including indigenous peoples and local communities.
- **Build Synergies:** Blend ILK with scientific knowledge to support effective IAS control and SU strategies.
- **Support Regional Collaboration:** Strengthen cross-border networks to facilitate shared knowledge and harmonized policies, particularly in transboundary ecosystems like the [Kavango Zambezi Transfrontier Conservation Area \(KAZA TFCA\)](#).





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