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The sustainable use of wild species benefits biodiversity and human well-being in South Africa

Significance:

A recent report from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) assessed how the sustainable use of wild species benefits people and nature, and which policies work best to prevent unsustainable exploitation. In the context of an accelerating and alarming biodiversity crisis, the assessment findings have important implications for South Africa, a megadiverse country with a population that relies extensively on the use of wild species for food, energy, medicine, and income, amongst many other purposes. This Commentary reflects on implications of the IPBES assessment for South Africa, drawing on insights from local contributing authors.

Introduction

The use of wild species is widespread and occurs across almost all aquatic and terrestrial ecosystems, from subsistence to global economies, and is embedded in local and global systems for food, medicine, hygiene, energy and many other uses.¹ This is certainly true of South Africa – a megadiverse country with high endemism levels and a growing human population that continues to depend on wild species to meet basic needs.

Despite a perceived disjuncture between conservation and development, the sustainable use of biodiversity can contribute significantly to South Africa's National Development Plan 2030 by reducing poverty and inequality and supporting more inclusive rural and urban economies.

Findings from the *Sustainable Use of Wild Species* assessment report, produced by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), are thus highly relevant for South Africa, and offer important insights and implications for the conservation and the sustainable use of biodiversity in the country. The report represents the first global synthesis on the use of wild species for food, energy, materials, medicine, recreation, ceremony, inspiration, and a range of other vital contributions to human well-being. It builds on IPBES' Global Assessment findings showing that overexploitation is the largest threat to life in the oceans and the second largest threat, after habitat transformation, to life on land.² Globally, the report can potentially influence implementation of the Convention on Biological Diversity (CBD) and the Kunming-Montreal Global Biodiversity Framework, which includes the sustainable use of biodiversity as one of four goals, and the focus of several targets.^{3,4} It is also relevant to achieving the country's Sustainable Development Goals (SDGs, Box 1). The report's findings are timely for South Africa, coinciding with the development of a draft White Paper on the conservation and sustainable use of biodiversity, the redrafting of national biodiversity laws, and the development of strategies to bolster the biodiversity-based economy – a sector projected to generate ZAR47 billion by 2030.⁵ The leadership role played by South Africa in the assessment is noteworthy. The five South African authors of this Commentary were among the 85 experts nominated to conduct the assessment, with one of the authors (J.D.) appointed as co-chair, thus enabling South African perspectives to inform the global assessment and its policy recommendations.

The approach adopted for the assessment categorised five broad 'practices' in the use of aquatic animals, terrestrial animals, trees and other plants, fungi and algae. The practices were fishing, gathering, logging, terrestrial animal harvesting (including hunting), and non-extractive practices (e.g. nature-based tourism). Each practice was analysed by inter-disciplinary expert teams across specific 'uses' (e.g. food and feed, materials, energy) over the last 20 years to assess the status and trends of sustainable use (Figure 1), identify causes of change in abundance and distribution of utilised wild species, explore likely futures of sustainable use, and assess policies and tools to promote sustainable use. Multiple forms of knowledge were used to develop credible, legitimate, and inclusive evidence. Innovative approaches to draw on traditional knowledge brought together many different local and indigenous voices using a range of platforms to explore different ways of knowing and being, and to recognise the centrality of wild species to the identities, cultures and livelihoods of many Indigenous peoples and local communities.

Key messages from the report's Summary for Policymakers (<https://zenodo.org/record/7411847>) show that the sustainable use of wild species is critical for people and nature, with over 50 000 harvested wild species documented (and many more likely used) as central to the needs and identities of billions of people, including Indigenous peoples and local communities and an estimated 70% of the world's poor. Although some 34% of wild species were estimated to be used sustainably globally, widespread unsustainable use of terrestrial and marine species has raised extinction risks for many species. Overexploitation (including global trade in wild species), landscape and seascape changes, climate change, pollution and invasive alien species impact wild species abundance and distribution, and impact negatively on those who rely on wild species for their subsistence, income, and well-being.

Here we present and discuss key messages from the assessment and their implications for South Africa.

The sustainable use of wild species is critical for South African people and nature

A central message of the report is that the sustainable use of wild species is critical for people and nature – a finding that resonates with the largely ubiquitous use of wild species in South Africa. For example, wild-caught commercial fisheries are worth approximately ZAR8 billion and employ some 27 000 people directly (up to 100 000 indirectly), and subsistence fishing is valued at about ZAR16 million and supports approximately 29 000 individual

subsistence fishers (2013 estimates).⁶ Although the financial contribution of small-scale fisheries to GDP is low (<1%), the sector is critical for providing employment and food to poor coastal communities⁶, as well as enabling well-being through connections to the ocean. More than 2000 plant species are used and traded for medicinal use, with an estimated value of about ZAR8 billion.⁷ Biodiversity-related tourism contributed over ZAR30 billion in 2015 and some 418 000 biodiversity-related jobs in South Africa, with each job in conservation supporting a further five that depend on biodiversity use.⁷ The tourism sector's growth can potentially contribute ZAR14 billion to GDP and double the number of jobs by 2030.⁸

Of relevance to South Africa is the high reliance of vulnerable people and communities on wild species. Wild species not only serve as a fall-back option for rural households during times of economic stress, but also add to people's livelihood security, especially for rural dwellers⁹, and, if well managed, can generate significant revenue and employment⁷.

Discussions frequently focus on the extractive use of wild species (i.e. plant harvesting, hunting, fishing), but wild species are also used extensively for non-extractive purposes. South Africa's wildlife-watching tourism industry is one example, but other non-tangible benefits provide an important part of our cultural heritage. Wild species are an intrinsic part of our national identity (e.g. proteas as the national emblem) and time in nature provides physical and mental well-being and, for some, connections with ancestral spirits.¹⁰

The report describes the global trends and regional variations in wild species use, based on systematic reviews of over 1600 sources (Figure 1). At a global level, use of wild species is mostly increasing, but its sustainability is highly variable and often unknown (Figure 1). In certain instances, wild species may be more intensively used in South Africa than elsewhere. For example, South Africa's iconic landscapes and megafauna support significant hunting, wildlife tourism and photography sectors. In

Practice	Use category	20-years global trends		Comments
		use	sustainable use	
FISHING 	Food Feed			Corresponds to large scale fisheries with intensive management, data rich
				Corresponds to large scale fisheries with weak management, data limited
				Corresponds to small-scale fisheries, based on a range of sources
	Medicine Hygiene			Based on stock status and total weight of products
	Recreation			Data limited
GATHERING 	Food Feed			Based on a range of sources
	Medicine Hygiene			Based on population trends, threatened categories and CITES listing
	Decorative Aesthetic			Based on threatened categories and CITES listing
LOGGING 	Material Construction			Based on total legal wood removal
	Energy			Based on a range of sources
TERRESTRIAL ANIMAL HARVESTING 	Recreation			Based on population trends, threatened categories and CITES listing
	Food - Feed			Based on increasing demand of wild meat in commercial markets, population trends
NON-EXTRACTIVE PRACTICES 	Recreation			Based on number of tourism revenue generated
	Ceremony Ritual			Data limited
	Medicine Hygiene			Data limited

WELL ESTABLISHED	STRONGLY OR SLIGHTLY INCREASING
ESTABLISHED BUT INCOMPLETE	STRONGLY OR SLIGHTLY DECREASING
UNRESOLVED	STABLE
INCONCLUSIVE	HIGH VARIABILITY IN TRENDS

Source: IPBES' (CC BY 4.0)

Figure 1: Global trends in use and sustainable use of wild species from 2000 to the present. The figure shows only the top two to three most documented use categories for each practice based on systematic literature reviews using >1600 sources. Trends in use refer to an assessment of the overall state of use for wild species in relation to the specified practice, i.e. has overall use increased strongly, increased, stayed the same, decreased or decreased strongly. The multi-directional arrow depicts highly variable trends across areas or sectors for a given category of practice-use. The colours of the arrows refer to the confidence levels associated with those trends. Trends in sustainable use specifically refer to whether the intensity and form of use have been deemed sustainable over the 20-year period. The comments column contains brief reference to how the trend was determined.



Box 1: How does the sustainable use of wild species contribute to achieving the United Nations' Sustainable Development Goals?

The sustainable use of wild species directly contributes, or has the potential to contribute, to *all* of the United Nations' Sustainable Development Goals (SDGs). Conversely, unsustainable use can be detrimental to achieving global targets. For example, trade in wild foods can compete with local subsistence use and can jeopardise local food security (SDG2). Unsanitary handling and consumption of wild animals can cause illness and increase the risk of zoonotic disease (SDG3). However, sustainable use of wild species can reduce poverty by providing food (SDG1, SDG2, SDG3), medicine (SDG1, SDG3) and income (SDG1, SDG8, SDG9, SDG10). Many uses of wild species have been shown to benefit women most (SDG5, SDG10). A strong body of evidence also reveals the critical role played by wild species for people in vulnerable situations (SDG10). Income derived from trade in wild species can provide cash to support children's education and wildlife watching may provide valuable educational experiences (SDG4). Including indigenous and local knowledge into formal education systems could support local biodiversity stewardship and sustainable use of wild species (SDG4, SDG14, SDG15). Sustainable logging practices can protect water quality and reduce soil erosion (SDG8), with wood biomass forming an important energy source (SDG7). The dependence on natural resources is not limited to rural regions, with increasing documentation of wild food harvesting in urban environments (SDG11). Promoting sustainable use of wild species through cross-sectoral and multilateral cooperation (SDG17) also supports responsible consumption and production (SDG12), reduces illegal trade of wild species and associated international criminal networks (SDG16), has synergies with many climate action activities (SDG13), and supports biodiversity conservation (SDG14, SDG15).

Source: Adapted from Table 1.3 in IPBES¹

rural areas, access to electricity is both erratic and expensive, leading to increased use of wild species for fuelwood, while many of the country's population still use traditional plant- and animal-based medicines. Many medicinal plants are harvested unsustainably, with 184 species in decline and 56 listed as threatened as a result of overexploitation⁷, highlighting how unsustainable use of wild species not only threatens biodiversity, but affects livelihoods and erodes cultural practices and identity.

National-level data for wild species use are under-studied and, where available, are often not helpful for decision-making. The National Biodiversity Assessment (2018) reported almost all taxonomic groups face increased extinction risk.⁷ But the true scale of the crisis remains underreported: 90% of the more than 770 recorded harvested marine taxa in South African waters have not had stock status assessments done, and the 10% of species that have been assessed, show that more than one third of stocks are overexploited or collapsed.⁷ A lack of appropriate, repeatable, and comparable indicators that reflect the linked social-ecological nature of sustainable use is a finding echoed in the report, with a specific call for more information on non-extractive and social uses.

South Africa's wild species are under threat, mirroring the global biodiversity crisis reported by IPBES.² The major threat to terrestrial and freshwater systems is the degradation and transformation of land, driven by agriculture and aquaculture, and urban, industrial and mining development, whilst fishing is the largest pressure on marine systems.⁷ Multiple threats to wild species may interact in complex ways. For example, the illegal succulent trade entices the involvement of local people who have limited socio-economic opportunities, leading to the over-harvesting of endemic species, such as those of the *Conophytum* genus, to supply a lucrative global horticultural market fuelled by social media platforms (e.g. #plantiktok). A perfect storm of overexploitation, a drying climate, overgrazing and mining are resulting in an unprecedented species decline in the world's most biodiverse desert ecosystem.¹¹ Illegal trade in abalone, rhino horn and a range of other wild species is also rife, exacerbated by the lack of enforcement, corruption, and the involvement of organised crime.¹²

Pathways and levers to promote sustainable use in South Africa

The final key messages outline potential pathways and levers to achieve the sustainable use of wild species in a dynamic future. Here 'levers' refer to ways of realising change when applied to 'leverage points' – areas where policy interventions could create vital change. The report grouped leverage points into seven policy categories, covered briefly below.

1. Policy options that are inclusive and participatory strengthen the sustainable use of wild species

The sustainable use of wild species is strengthened when decision-making processes are transparent and inclusive. South Africa has progressive policies and laws to enable public participation. Civil society groups have

successfully advocated for citizens' participation in decision-making, lobbying for changes in legislation against, for example, unsustainable hunting practices, captive breeding and hunting of big cats, local communities' fishing rights, and settling of land claims in protected areas. However, spaces for policy influence have increasingly closed¹³, hindered by a lack of awareness of citizens' rights, the reluctance of government officials to promote functional (as opposed to 'on-paper') participation, a state that has veered away from alliances with civil society, and severe inequality which hinders the rural poor from participating on equal terms with wealthy urban citizens. This is a crucial leverage point for both biodiversity and human well-being; it is well recognised that conservation strategies that meaningfully involve local communities lead to positive conservation and socio-economic outcomes.¹⁴

2. Policy options that recognise and support plural knowledge systems enhance the sustainable use of wild species

Policy and decision-making processes that bring scientists and traditional knowledge holders together to co-learn from diverse forms of knowledge can help to promote the sustainable use of wild species. Scientific knowledge of sustainable use, especially ecological aspects, is relatively well developed in South Africa, thanks in part to specialised academic institutions with a history of biodiversity research. Many South Africans, especially those living close to nature in rural areas, have a rich body of knowledge about wild resources and a history of using them in their cultures, traditions, and livelihoods¹⁰, but such knowledge has yet to be properly recognised and integrated into decision-making. Reasons for this include the fragmentation of academic disciplines and government departments, particularly in the areas of agriculture, fisheries and biodiversity, and an underappreciation for the value of local knowledge. It is also essential to have inter- and trans-disciplinary teams that include those from the social sciences and humanities in addition to biophysical scientists, to best understand and address knowledge on the integrated nature of wild species and ecosystems use with humans and societies. This is a need that is often identified but rarely implemented meaningfully.

3. Policy instruments and tools need to ensure fair and equitable distributions of costs and benefits from the sustainable use of wild species

Policies underpinned by social equity, including the fair and equitable distribution of costs and benefits, are more likely to advance the goals of conservation and development.^{1,14} South Africa has progressive biodiversity laws which aim to safeguard indigenous knowledge holders and local communities, ensuring that they share in the benefits of biodiversity use. These include the *National Environmental Management Biodiversity Act* and the recently promulgated *Indigenous Knowledge Systems Act*. These laws aim to address historical injustices of so-called biopiracy – the misappropriation of genetic resources and traditional

knowledge without consent or compensation, often tied to patenting and the development of commercial products. Dozens of benefit-sharing agreements have been brokered in South Africa to comply with these laws and achieve restorative justice, linked to globally traded species such as *Pelargonium sidoides* (to treat bronchitis), *Aspalathus linearis* (rooibos tea), *Scelletium tortuosum* (to treat anxiety and depression), *Aloe ferox* (wide medicinal and cosmetic uses), and many others. Although the agreements have succeeded in distributing finances and, in part, recognising traditional knowledge holders, evidence suggests they have also been highly fraught and contested, often with ambivalent outcomes.¹⁵ Moreover, harvesters continue to receive a low price for wild resources, such as medicinal plants¹⁶, linked largely to inequities in global and national trade chains. Such cases point towards the complexities of realising social justice in practice, even with supportive policies in place.

Rural South Africans who live with wild resources are often the most vulnerable to the costs (e.g. crop damage from wild animals) and seldom receive a fair share of the benefits (e.g. national parks' tourism proceeds¹⁷). Limited access to land and resources, a pervasive theme in South Africa's history of dispossession, also restricts benefit sharing of both tangible (e.g. natural resources) and intangible benefits (e.g. cultural identity and place-based attachment¹⁸). Policies that enable local communities to benefit from the use of wild resources at sustainable levels that match the costs of damages, alongside government and NGO support, contracts and off-take agreements, help to address the problem.

4. Context-specific policies are needed to ensure the sustainable use of wild species

One-size-fits-all policies that do not consider regional variations in wild species abundance, social and governance contexts, and land and resource ownership, are likely to be resisted by resource users who have experience of conserving and sustainably using wild resources. More functional involvement of local resource users in developing regulations, coupled with more flexible policies, could be an important lever towards more sustainable wild resource use and management. Recognition of customary law and practices forms an important part of such measures.

5. Monitoring wild species and practices is crucial to prevent species decline

South Africa, like the rest of the world, has inadequate indicators and monitoring tools for sustainable use, undermining effective decision-making and positive outcomes. Although fisheries and logging sectors have well-developed sustainability indicators, those for terrestrial harvesting and non-extractive practices are lacking. Where indicators do exist, as for national fisheries stock assessments, these are not computed for all exploited species. Across all practices, emphasis needs to be placed on developing relevant and integrated social-ecological metrics, rather than simply focusing on harvestable resources. National policy should include multiple forms of knowledge to achieve comprehensive, appropriate indicators, utilising the national wealth of local knowledge.

Monitoring is one of the central principles of good governance of common pool resources. It not only enables stakeholders to track change and adaptively manage use levels and methods, but also holds people accountable. Participatory monitoring tools are available and these, coupled with local and traditional knowledge and involvement of knowledge holders, could be a valuable lever to avoid unsustainable wild resource use practices.¹⁹ Monitoring can be further strengthened through use of appropriate technologies (e.g. smartphone apps), community engagement and citizen science, an area where South Africa has good experience and expertise.

6. Policy instruments that are aligned and maintain coherence and consistency will be more effective

South Africa, as a signatory to global multilateral agreements (e.g. CBD and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)), is, in principle, strongly aligned with international policy agreements relating to the sustainable use of wild species. The country also has a strong body of customary law and

practices that support sustainable use. However, clashing policies at the national and sub-national level (e.g. between provinces, between sectors such as agriculture, mining, and environment, or between statutory and customary governance systems) confuse resource users and are an obstacle to sustainable use. Illicit trade in wild resources can also flourish due to a lack of consensus among neighbouring countries around laws and penalties or a lack of consistent policies and laws across the supply chain.¹² There is a need to assess misalignment and, where necessary, adapt policies, and their implementation, to be more compatible across regions and sectors.

7. Robust institutions are essential to the future sustainable use of wild species

Rules and codes of conduct that support collaborative and decentralised engagement and hold users and decision-makers accountable are at the centre of sustainable resource use, while weak institutions may struggle to exercise control. This is particularly true for customary institutions managing common pool resources in cases where commercial pressure has intensified beyond the sustainable off-takes associated with traditional measures, or where customary governance has broken down. Mopane worms, for example, are in high demand in urban areas, leading to increased harvesting pressures and, often, unsustainable use that is poorly regulated in communally managed areas.²⁰ Analysis of likely futures for the sustainable use of wild species suggests there will be increased pressures associated with climate change, disruptive technological advancement and increasing consumption. Institutions will need to respond to these, and other changes, through constant negotiation and adaptive approaches.

Conclusion

The *Sustainable Use of Wild Species* assessment helps to guide a South African approach for sustainably using wild resources and underscores the importance of preventing biodiversity loss to maintain the benefits provided to people and nature while contributing towards achieving the country's SDGs. In South Africa, there is significant potential in finding solutions that marry development, biodiversity, and livelihoods in the use of wild species and habitats. Yet significant challenges remain, centred indisputably on policy implementation rather than the policies themselves.

A review of the conservation and use of biodiversity in South Africa, undertaken more than 20 years ago²¹, concluded that major constraints precluding more effective management included a lack of capacity, inadequate skills and expertise, insufficient budgets, legal fragmentation and weak political commitment. It is disheartening to note that all of these continue to be key hurdles in securing a sustainable biodiversity economy. Moreover, while inclusive decision-making is well entrenched in the Constitution and in sectoral laws, there are major differences in the level of participation by different interest groups, and in the extent of engagement by different government departments. Local communities and traditional knowledge holders seldom have the means and finances to participate on equal terms, and while increasing efforts aim to forefront different ways of knowing, research continues to be dominated by paradigms set in the Global North.

The IPBES *Sustainable Use of Wild Species* assessment provides the impetus for placing biodiversity at the centre of sustainable development. Taking on board its recommendations, securing political commitment, allocating sufficient budgets towards its implementation, and developing the skills and capacity required, provides the opportunity for South Africa to showcase both its biodiversity heritage and its ability to implement viable solutions for people and nature.

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Competing interests

We have no competing interests to declare. All authors were among the 85 experts who conducted the assessment and J.D. was co-chair.

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