

**Animal Markets
and Zoonotic Disease in
South Africa**

COUNTRY SUMMARY: SOUTH AFRICA

CULTURAL CONTEXT

South Africa is the southernmost country on the African continent and is home to over 60 million people, of which the majority are Black Africans. The country has an unemployment rate of over 35%, contributing to high levels of poverty, large urban informal settlements, and extensive poor rural areas. Expanding poverty (exacerbated by impacts of COVID-19) has fuelled demand for cheap protein, driving formal and informal livestock markets as well as practices associated with cheaper standards of production and handling, and increased disease risks. Conservation and wildlife-based tourism contributes substantially to the South African economy. Many wildlife reserves and conservation areas (national, provincial, or privately owned) are surrounded or bordered by large communities. While there are some positive associations between reserves and communities (job creation, schools, clinics, meat supply etc.), there is also increasing pressure on biodiversity caused by poaching, land incursions, and land claims. South Africa has had a tumultuous political and social history that has and continues to influence attitudes toward animals. With high levels of violence and criminality, there is some disregard for, and desensitization to human and animal suffering.

ANIMAL MARKETS

South Africa has both formal, regulated animal production systems, and informal unregulated supply chains, many of which are ripe for zoonotic disease transmission. The production of food and fiber from domestic animals, and an extensive emerging practice of farming wild animals (including elk, antelope, lions, rhinos, and African grey parrots) for trade, tourism, and human consumption, are both substantially regulated, but not expressly for the management of zoonoses risk. A wide range of other supply chains exist (such as for traditional medicinal use) in which both wild and domestic animals are traded and consumed, often in pop-up roadside locations. Many of these are poorly regulated or not regulated at all. Due to the variety, extent and unregulated nature of the informal markets, the exact number and location of all trading locations are difficult to quantify and characterize, and conditions vary considerably.

DRIVERS OF ZOOONOTIC DISEASE RISKS

South Africa produces large numbers of animals and animal products in circumstances where animal health is systemically compromised, different species are kept in close proximity, live animals are transported long distances, and are slaughtered and consumed in conditions lacking sanitation. Structural deficiencies in the devolution of state competencies, a lack of political commitment, fragmentation of environmental and wildlife legislation between national government and the nine

provinces, and inefficiencies in enforcement all erode the ability of the state to adequately address these public health concerns. There is also an acute lack of accurate information about the informal markets. Demand for high value wildlife products particularly in Asian markets and continued use and demand for traditional medicines drive legal and illegal wildlife trade further heightening zoonotic disease risk.

RISK MITIGATION AND RELEVANT CHALLENGES

There is a national animal disease surveillance system established by the terms of The Animal Disease Control Act. Monitoring at formal points in the domestic animal value chain is strong, but it is less robust in the context of wildlife where there is no routine monitoring of formal or informal wildlife trade. The enforcement of wildlife laws falls under the Environmental Management Inspectorate, but inspectors are not empowered to deal with animal disease issues, housing, or husbandry practices. Wildlife and environmental crime and animal welfare are still seen as low priority by the judiciary system.

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INTRODUCTION

The COVID-19 pandemic has had a major impact on South Africa, both from a human health and economic point of view. Despite the origins of this particular novel coronavirus already being substantially understood, the South African government has not expressly sought to address the risk factors for further zoonoses from domestic sources by amending government policy or addressing the regulatory framework. The country has a number of contexts in which such zoonoses might manifest. The conditions in which animals are bred, transported, sold, slaughtered, and consumed are of particular concern, especially those where animals of different species are confined in close proximity, suffer poor welfare and associated stresses, are kept, transported, or killed in unsanitary circumstances, and where humans are exposed directly to these conditions. South Africa has both formal regulated animal production systems, and informal unregulated supply chains, many of which present these risk factors. The production of food and fiber from domestic animals, and an extensive emerging practice of farming wild animals for trade and human consumption, are both substantially regulated, but not expressly for the management of zoonotic risk. A wide range of other supply chains exist in which both wild and domestic animals are traded and consumed, and these are poorly regulated or not regulated at all. Structural deficiencies in the devolution of state competencies, a lack of political commitment, and inefficiencies in enforcement all erode the ability of the state to adequately address these public health concerns. There is also an acute lack of accurate information about the informal markets.

Priorities in addressing the risk of future zoonoses include recognizing the need for change, commissioning reliable research into the nature of informal markets that trade in animals or animal products, addressing structural deficiencies in the devolution of state responsibility for environmental management, and regulation of all circumstances in which animals are produced and consumed. In the longer term, socioeconomic changes that reduce poverty, increase employment, improve food security, and raise education standards will all reduce the risk of zoonotic disease transmission from animal markets.

RELEVANT CONTEXT

South Africa has had a tumultuous political and social history that continues to influence attitudes toward animals. With high levels of violence and criminality, there are associated levels of cruelty toward animals and desensitization to both human and animal suffering.¹ On the other hand, the diverse cultural, multinational, socioeconomic, religious, and contested political nature of South African society produces an equally diverse range of relationships between humans and non-human animals, ranging from purely utilitarian to sentimental, close relationships. Different cultures within the country have their own relationships with animals, but many South Africans instrumentally view animals as exploitable resources.²

Despite extensive submissions made by animal protection advocates during and immediately after the development and implementation of South Africa's new constitution, the status of animals as

1. Lindy Heinecken. "What's behind violence in South Africa: A sociologist's perspective," *The Conversation*, January 15, 2020, <https://theconversation.com/whats-behind-violence-in-south-africa-a-sociologists-perspective-128130>.
2. Thembelihle Zuma et al., "The Role of Traditional Health Practitioners in Rural Kwazulu-Natal, South Africa: Generic or Mode Specific?" *BMC Complementary and Alternative Medicine* 16, no. 1 (2016): 304.

property has remained unchanged in the country's post-apartheid constitutional democracy.³ Indeed, the state is currently at the forefront of anthropocentric animal exploitation. The Department of Agriculture, Land Reform and Rural Development (DALRRD) resolves its conflicting mandates of protecting animals and promoting factory farming quite expressly in favour of the latter.⁴ The Department of Forestry, Fisheries and the Environment (DFFE) has similarly promoted consumptive use (in the form of trophy hunting, international trade in live animals, captive breeding, etc.) as a key component of the Biodiversity Economy.⁵ The formal wildlife industry is considered by the government to be an important contributor to the economy, job creation, and development in South Africa.⁶ This is underpinned by an argument that South Africa's constitutionally-enshrined right to a safe environment also underwrites all manner of consumptive use, including that of threatened or endangered wildlife. South Africa thus has a strong pro-trade and utilization approach to not only domestic animals but also to all wildlife and wildlife products, including the 'farming' and ranching of threatened species for trade (e.g., rhino horn and lion bone).

The formal commercial wildlife industry and associated activities also have broad general support from the government through South Africa's entrenched sustainable use wildlife model and a strong, unified, well organized and represented industry. Conservation and environmental organizations generally are supportive of this model but with some opposition to, and concerns about, practices that may pose risks to biodiversity.⁷ The attitude towards practices varies greatly across provinces, with some declining to approve permits for intensive breeding of captive animals such as lions, while others readily approve such practices. The wildlife industry actively cultivates a widespread and deeply entrenched hunting culture, and there is a strong drive by the industry to have commercially utilized wildlife viewed as agricultural (farmed) animals.⁸ This would allow species normally categorized as wildlife to be managed, regulated, and legislated separately from free-ranging and state-owned wildlife.⁹ There is also considerable political pressure on the state for both the reframing of local legislation and to revisit restrictions on trade in terms of international treaties like the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Under South Africa's apartheid government, there was strong opposition to recognizing traditional African cultural practices, after the advent of the current constitutional democracy, structures were put in place to facilitate traditional medicine, healers, and cultural practices, despite some ongoing resistance to formalizing cultural and traditional medicines.¹⁰ South Africa has many language groups and local cultures, constituting a very diverse society with substantial influences and mixing of local,

3. Michelè Pickover, *Animal Rights in South Africa* (Cape Town: Double Story, 2005), 7.

4. Michelè Pickover, *Animal Rights in South Africa* (Cape Town: Double Story, 2005), 7.

5. Government of South Africa, *South Africa's 2nd National Biodiversity Strategy and Action Plan, 2015–2025* (Pretoria: Department of Environmental Affairs, 2015).

6. Andrew Taylor, Peter Lindsey, and Harriet Davies-Mostert, *An Assessment of the Economic, Social and Conservation Value of the Wildlife Ranching Industry and Its Potential to Support the Green Economy in South Africa*, (Johannesburg: The Endangered Wildlife Trust, 2016).

7. Steven Broad, "Wildlife Trade, COVID-19 and Zoonotic Risks: Shaping the Response," TRAFFIC Briefing Paper, 2020. See also: Andrew Taylor, Peter Lindsey, and Harriet Davies-Mostert, *An Assessment of the Economic, Social and Conservation Value of the Wildlife Ranching Industry and Its Potential to Support the Green Economy in South Africa* (Johannesburg: The Endangered Wildlife Trust, 2016).

8. "S.A. Game Ranchers Accept Responsibility for Self-Regulation of Wildlife Species," *Lowvelder*, October 30, 2019, <https://lowvelder.co.za/510622/sa-game-ranchers-accept-responsibility-self-regulation-wildlife-species/>. See also: Adam Cruise, "Animal Farm: South Africa's Blind Adherence to Neo-Colonial Wildlife Conservation," *The Journal of African Elephants*, June 17, 2020, <https://africanelephantjournal.com/animal-farm-south-africas-blind-adherence-to-neo-colonial-wildlife-conservation/>.

9. "S.A. Game Ranchers Accept Responsibility for Self-Regulation of Wildlife Species," *Lowvelder*, October 30, 2019, <https://lowvelder.co.za/510622/sa-game-ranchers-accept-responsibility-self-regulation-wildlife-species/>.

10. Amber Louise Abrams, Torkel Falkenberg, Christa Rautenbach et al., "Legislative Landscape for Traditional Health Practitioners in Southern African Development Community Countries: A Scoping Review." *BMJ Open* 10, no. 1 (2020): e029958.

pan-African, Asian, and European cultures and practices. This highly dynamic environment is one of the major features of the traditional and bushmeat markets in South Africa. There are also several religious slaughter practices that take place in South Africa, most commonly halaal, kosher, and qurbani, which take place in formal registered abattoirs and are governed by regulations passed under the Meat Safety Act 40 of 2000.¹¹ Qurbani takes place at organized slaughter sites with welfare monitoring.¹² Slaughter can be for several purposes, such as giving thanks, requests to deities, honoring the dead, communication with ancestors, and various worship traditions.¹³ Xhosa culture, as one example, requires that a goat or sheep be slaughtered following a birth in the family. This is accompanied by specific rituals and utilization of parts of the slaughtered animal.¹⁴ This cultural slaughter usually involves the use of the meat for consumption. Pieces of the skin and fur may be used as bracelets as part of ritual. This type of slaughter is less connected to traditional medicine but rather to traditional and cultural ritual.

As of the time of writing, the Animals Protection Act, which dates back to 1962, has not had any significant amendments in 60 years, but South Africa's new constitution did enshrine both the principle of sustainable use of the environment and, thus, of (wild) animals, and the primacy of cultural, traditional, and religious rights.¹⁵ The belief in traditional medicine and healing practices, and the supply of and demand for animal products, fulfills important cultural and economic functions and the continuation of indigenous knowledge.¹⁶ Traditional medicine and healing not only fulfil cultural needs and beliefs, but also provide affordable and accessible alternative services when conventional medicine is not readily accessible. Such use of traditional medicines is believed to be rapidly expanding in South Africa, with traditional healers outnumbering western doctors.¹⁷ Consumers and patients are increasingly utilizing allopathic and traditional medicines in conjunction. Traditional healers are important components of both the formal and informal healthcare system and communities, whose roles include leadership and the preservation of traditional and indigenous knowledge.¹⁸

One traditional African view of animals holds that humans are not morally superior to animals, trees, fish, and birds.¹⁹ This view recognizes the interconnected nature of ecological systems, citing mutual dependence and an ethic of respect. The concept of ubuntu, a phrase that, loosely interpreted,

11. Government Gazette No 26669, Red Meat Regulations No 1072, September 17, 2004.

12. Qurbani means sacrifice. Every year during the Islamic month of Dhul Hijjah, Muslims around the world slaughter an animal – a goat, sheep, cow or camel – to reflect the Prophet Ibrahim's willingness to sacrifice his son Ismail, for the sake of God.

13. See for example: Molaole Montsho, "Rights Commission: Animal Slaughter should Continue," Mail & Guardian, March 29, 2011, <https://mg.co.za/article/2011-03-29-rights-commission-animal-slaughter-should-continue/#:~:text=Communities%20should%20continue%20to%20slaughter,of%20Culture%20and%20Religion%20said>.

Regarding Zulu religious slaughter for mourning and ensuring family health, see: David Bogopa, "Health and Ancestors: The Case of South Africa and Beyond," *Indo-Pacific Journal of Phenomenology* 10, no. 1 (2010): 1–7, DOI: 10.2989/IPJP.2010.10.1.8.1080.

14. David Bogopa, "Health and Ancestors: The Case of South Africa and Beyond," *Indo-Pacific Journal of Phenomenology* 10, no. 1 (2010): 1–7, DOI: 10.2989/IPJP.2010.10.1.8.1080.

15. Constitution of South Africa 108 of 1996 Chapter 2: 7–39 Bill of Rights (RSA, 1996), <https://www.gov.za/documents/constitution/chapter-2-bill-rights>.

16. Joan Liverpool, Randell Alexander, Melba Johnson et al., "Western Medicine and Traditional Healers: Partners in the Fight against HIV/AIDS," *Journal of the National Medical Association* 96, no. 6 (2004): 822–5.

17. Mmamoshedi Mothibe and Mncengeli Sibanda, "African Traditional Medicine: South African Perspective," in *Traditional and Complementary Medicine*, ed. Cengiz Mordeniz (London: IntechOpen, 2019).

18. See for example: Kingsley Akarowhe, "Traditional Medicine in Contextual African Society: On-Going Challenges," *Open Access Journal of Oncology and Medicine* 1, no. 3 (2018): 52–5;

Renee Street and Christa Rautenbach, "South Africa Wants to Regulate Traditional Healers – But It's Not Easy," *The Conversation*, January 21, 2016, <https://theconversation.com/south-africa-wants-to-regulate-traditional-healers-but-its-not-easy-53122>;

Renee Anne Street, "Unpacking the New Proposed Regulations for South African Traditional Health Practitioners," *South African Medical Journal* 106, no. 4 (2016): 22–3.

"S.A. Game Ranchers Accept Responsibility for Self-Regulation of Wildlife Species," *Lowvelder*, October 30, 2019, <https://lowvelder.co.za/510622/sa-game-ranchers-accept-responsibility-self-regulation-wildlife-species/>.

19. Kai Horsthemke, *The Moral Status and Rights of Animals* (Randburg: Porcupine Press, 2010).

means “I am because we are,” lends itself to a broad recognition of the respectful mutual dependence between humans and nonhuman animals. Others have argued that the ubuntu worldview includes all beings, humans, nonhuman animals, and nature all together in the “community of beings.”²⁰ The idea that ubuntu extends to nonhuman animals is contested, and other views hold that despite various attempts to stretch this concept to include nonhuman animals, it is in the final analysis an anthropocentric idea that reinforces the widespread use of animals.²¹

South Africa has high levels of unemployment and poverty, large informal urban settlements, and extensive poor rural areas. These economic factors play a substantial role in determining people’s attitudes toward nonhuman animals. In addition to the cultural functions identified above, the informal markets and supply chains for both livestock and wild animal products like bushmeat provide a significant source of food and income, and further shape how people understand non-human animals.²² The criminal component of poaching and bushmeat (for both subsistence and commercial ends) is regarded by some as a “Robin Hood” situation resonant with the political situation of discriminatory inequality.²³ These illegal activities may impose significant negative impacts on communities, such as intimidation, violence, protection rackets, and forced participation in illegal activities and trade.²⁴

Definitions and Descriptions: South African Common Usage

African Traditional Medicine: The World Health Organization’s (WHO) definition is “The sum total of all knowledge and practices, whether explicable or not, used in diagnosis, prevention and elimination of physical, mental, or societal imbalance, and relying exclusively on practical experience and observation handed down from generation to generation, whether verbally or in writing.”²⁵

Biltong: A form of dried, cured meat that originated in Southern Africa.

Bushmeat: Meat from any wild species, usually referring to poached animals.

Domestic animal: Refers to animals that have been selectively bred and/or genetically adapted over generations to live alongside humans and are genetically distinct from their wild ancestors and cousins (includes ‘companion’ animals like dogs and farm animals like cows and sheep).

Community: Commonly refers to a population living in a discrete area, who may operate collectively and be stakeholders in political and economic processes. Some are informally managed or may be organized/managed by tribal and traditional authorities.

Exotic animals: Used in the South African context to refer to wildlife that are not indigenous to South Africa and includes both wild and captive bred animals.

20. Edwin Etieyibo, “Ubuntu and the Environment,” in *The Palgrave Handbook of African Philosophy*, edited by Adeshina Afolayan and Toyin Falola (New York: Palgrave MacMillan, 2017) 633–57.

See also: Workineh Kelbessa, “Environmental Philosophy in African Traditions of Thought,” *Environmental Ethics* 40 (2018): 309-23.

21. Kai Horsthemke, *The Moral Status and Rights of Animals* (Randburg: Porcupine Press, 2010).

22. Alexandre M. Chausson et al., “Understanding the Sociocultural Drivers of Urban Bushmeat Consumption for Behavior Change Interventions in Pointe Noire, Republic of Congo,” *Human Ecology* 47, no. 2 (2019): 179–91.

23. Marion Whitehead, “Poaching a Political Problem,” *Conservative Action Trust*, October 4, 2014, <https://conservationaction.co.za/media-articles/poaching-a-political-problem/>.

24. GI-TOC (Global Initiative Against Transnational Organized Crime), *Crime and Contagion: The Impact of a Pandemic on Organized Crime* (Geneva: Global Initiative Against Transnational Organized Crime, 2020), <https://globalinitiative.net/wp-content/uploads/2020/03/GI-TOC-Crime-and-Contagion-The-impact-of-a-pandemic-on-organized-crime-1.pdf>.

25. M. G. Mokgobi, “Understanding Traditional African Healing,” *African Journal for Physical Health Education, Recreation, and Dance*, 20, Suppl. 2 (2014): 24–34, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4651463/>.

Game ranching: The maintenance of wild animals in defined areas delineated by fences. It is a form of husbandry similar to cattle ranching. The animals are managed on natural vegetation, although the habitat may be manipulated to improve production efficiency.

Informal settlements: Used commonly to refer to informal unplanned settlement on land that has not been surveyed or proclaimed as residential, consisting mainly of temporary shack-like structures and no support services (sanitation, water, etc.).

Inyanga: A traditional healer using primarily plant and animal-based products.

Intensive game farming: Refers to an agricultural system in which wild animal species are maintained in order to harvest by-products such as meat or skins in a domesticated or semi-domesticated manner by being enclosed in relatively small areas and provided with regular supplementary feeding and water.

Livestock: Commonly defined as domesticated animals that are farmed or maintained in agricultural settings for commodities such as meat, eggs, milk, fur, leather, and wool or used for working purposes.

Muti or muthi: Southern African term referring to traditional uses of plants and animal products for medicinal, healing, and spiritual purposes.

Roadside or informal trader: Trader who sells products on the roadside or in a common use area without formal infrastructure.

Sangoma: Zulu traditional healer primarily using divination-based healing and practice.

Traditional Healers: Traditional Healers fulfil different social and political roles in the community, including divination, healing physical, emotional, and spiritual illnesses, directing birth or death rituals, finding lost cattle, protecting warriors, counteracting witchcraft, and narrating history, cosmology, myths, and tradition.

Venison: Meat of wild species, most commonly antelope and hooved game species.

Wildlife: In the South African context, refers to non-domesticated native or indigenous species and includes both captive-bred and wild animals.

Wildlife industry: Refers to the commercial breeding, ranching, farming, harvesting, and trade in live animals and parts, and associated industries and activities

Witchcraft: The term “witch doctor” is a European term, but in South Africa, witches and witchcraft are a mix of traditional and complementary medicine (T&CM), and associated with practices that use body parts etc.

Further Background and COVID-19 Context

South Africa announced its first COVID-19 positive case on March 5, 2020, with severe Level 5 lockdown regulations coming into effect on March 26, 2020. A progressive easing of restrictions through 2020 preceded a return to Level 3 restrictions in early December 2020, when a second wave with a new variant of the COVID-19 virus was announced.²⁶ Following a significant increase in cases, overloaded health systems, and poor compliance with preventative measures, Level 3 restrictions were reinstated on December 29, 2020. At the time of writing, current regulations still limit the movement and association of people in a material way. The COVID-19 pandemic and associated State of Disaster Regulations

26. WHO. “SARS-CoV-2 Variants.” WHO Disease Outbreak News (2020). Published electronically 31 December 2020. <https://www.who.int/csr/don/31-december-2020-sars-cov2-variants/en/>.

have had a significant impact on the economy, tourism, and conservation in South Africa.²⁷ The real impact, outcome, and possible recovery are still largely unknown and unpredictable, and the situation remains dynamic.

Published research prior to 2020 indicated various zoonotic risks and identified inadequate data, monitoring, and mitigation measures, as well as potentially problematic policies and activities.²⁸ More research and systematic data collection are needed. South Africa was initially acknowledged by the WHO for a “good” response to the crisis.²⁹ However, the country continues to exhibit many conditions and circumstances that contribute to and increase the risks of zoonotic disease.³⁰ There has been little official acknowledgement of the relationship between COVID-19 and zoonotic risks associated with wildlife utilization, intensive farming activities, and biodiversity degradation.³¹ Unlike announcements made in China and other Asian countries regarding wildlife markets and zoonotic risks, there was no proactive response from the South African authorities in terms of warnings, or regulatory and operational adjustments regarding wildlife consumption, only the standard indications that ongoing changes to wildlife and agricultural policy were informed by socioeconomic factors and not by zoonotic risks and concerns. It is also worth noting that the WHO recently came out with an investigative report suggesting COVID most likely originated from wildlife farms rather than markets.³² This is quite relevant to South Africa, given our high number of wildlife farms and wildlife breeding operations and the extensive and diverse use (largely unquantified, unqualified, and unregulated) of wildlife in traditional medicine.³³

Zoonoses are not a new public policy challenge in South Africa. In 2018-2019, the country had one of the world’s largest outbreaks of listeriosis through contaminated food products, with over 200 fatalities and 1,000 laboratory confirmed cases.³⁴ This outbreak received wide publicity at the time, but there has been little recognition of the general zoonotic risks inherent in South African markets and food supply chains. This has not changed with the COVID-19 pandemic. General public awareness and acknowledgement of the probable source of COVID-19, zoonosis, and of the risks for further pandemics appear to be limited. Mistrust of the government, corruption, economic instability and history, plus poor standards of education, have contributed to high levels of COVID-19 vaccine hoax and conspiracy

27. Jason Burke, “South African Game Reserves Face Hard Times as Covid Halts Tourism,” *The Guardian*, January 3, 2021, <https://t.co/b8niHtQoXJ?amp=1>.
See also: Peter Lindsey, James Allan, Peadar Brehony et al., “Conserving Africa’s Wildlife and Wildlands through the COVID-19 Crisis and Beyond,” *Nature Ecology & Evolution* 4 (2020): 1300–10, <https://doi.org/10.1038/s41559-020-1275-6>. See also: Tom Head, “It’s Court, but Not as We Know It: Coronavirus Changes Legal Proceedings,” *The South African*, March 17, 2020, <https://www.thesouthafrican.com/news/coronavirus-changes-court-south-africa-whats-new/>.
28. R. J. Delahay, J. de la Fuente, G. C. Smith et al., “Assessing the Risks of SARS-CoV-2 in Wildlife,” *One Health Outlook* 3 (2021): 7, <https://onehealthoutlook.biomedcentral.com/articles/10.1186/s42522-021-00039-6>. See also: Ross Harvey, “Covid-19: A ‘Black Swan’ Hiding in Plain Sight Has Important Lessons for SA,” *IOL*, April 3, 2020, <https://www.iol.co.za/news/opinion/covid-19-a-black-swan-hiding-in-plain-sight-has-important-lessons-for-sa-46110460>.
29. Andrew Meldrum, “A Pandemic Atlas: South Africa Acts Quickly, Dodges Disaster,” *Associated Press*, December 16, 2020, <https://apnews.com/article/pandemics-health-johannesburg-coronavirus-pandemic-africa-30ed640d2f115747b2cd32505ecd292b>.
30. S. N. Bye, and M. F. Dutton. “The Inappropriate Use of Traditional Medicines in South Africa,” *Journal of Ethnopharmacology* 34, no. 2-3 (1991): 253–9, [https://doi.org/10.1016/0378-8741\(91\)90044-E](https://doi.org/10.1016/0378-8741(91)90044-E).
31. Humane Society International – Africa has supplied two white papers detailing the link between zoonoses and wildlife consumption and industrial agriculture to the South African government. Neither the Department of Forestry, Fisheries and the Environment nor the Department of Agriculture, Land Reform and Rural Development have acknowledged the research supplied, nor the issues raised therein.
32. Michaelleen Doucleff, “WHO Report: Wildlife Farms, Not Market, Likely Source Of Coronavirus Pandemic,” *NPR*, March 29, 2021, <https://www.npr.org/sections/goatsandsoda/2021/03/29/982272319/who-report-wildlife-farms-not-market-likely-source-of-coronavirus-pandemic>.
33. “Reducing Public Health Risks Associated with the Sale of Live Wild Animals of Mammalian Species in Traditional Food Markets,” *World Health Organization*, April 12, 2021, https://cdn.who.int/media/docs/default-source/food-safety/ig--121-1-food-safety-and-covid-19-guidance-for-traditional-food-markets-2021-04-12-en.pdf?sfvrsn=921ec66d_1&download=true
34. NICD (National Institute for Communicable Diseases), “An Update on the Outbreak of *Listeria monocytogenes*, South Africa,” *Communicable Diseases Communiqué* 17, no. 8 (2018): 4–6, <https://www.nicd.ac.za/wp-content/uploads/2018/08/An-update-on-the-outbreak-of-Listeria-monocytogenes-South-Africa.pdf>.

theories.³⁵ COVID-19 has also highlighted risks of biodiversity loss, climate change, intensive farming, and increased interface with wildlife, leading to calls for change and action from environmental and animal protection NGOs and civic groups and also drawing attention to conservation funding, support for further research, and the mitigation of pandemics.³⁶ An important, related aspect is that conservation and wildlife-based tourism contributes substantially to the South African economy.³⁷ COVID-19 and the associated trade, travel, and tourism restrictions have had a major negative impact on conservation and the wildlife industry, exposing the weaknesses of the current funding and support models and highlighting an urgent need for alternate, more sustainable models and revenue sources.

Many of the wildlife reserves and conservation areas (national, provincial, and privately owned) are surrounded or bordered by large communities. While there are some positive associations between reserves and communities (job creation, schools, clinics, meat supply, etc.), there is also increasing pressure on biodiversity with poaching, snaring, land incursions and claims, etc. Poaching activities vary from basic subsistence snaring for food to well-organized poaching for bushmeat, wildlife products, curios, traditional medicines, and high value products (rhino horn, pangolin, big cat teeth and claws, and ivory).³⁸ Demand for high value wildlife products by the Asian markets is driving both legal and illegal markets, with strongly opposing and actively contested issues around the legal trade and farming of these products, resulting in a both a supply- and demand-driven market.³⁹ South Africa is one of the largest exporters of live wildlife for tourism, display, captive breeding, and farming for derivatives. As one example: several dozen white rhino have been exported to China and Vietnam for breeding and horn harvest.⁴⁰ There is also an international demand for reptiles, amphibians, and parrots, with both legal breeding and export and illegal harvesting from the wild trafficked internationally.⁴¹

Stock theft, poaching, and land grabs are linked to increasing levels of poverty. Commercial and subsistence poaching and stock theft traditionally increase around the Christmas periods with the movement of people from urban to rural areas and time off work. The restriction of interprovincial movements and enforcement at roadblocks led to changes in poaching patterns during the early COVID-19 lockdowns. Localized poaching increased but the reduced ability of informal and illegal trading syndicates to move animals and products impeded commercial poaching efforts.⁴² There has been an increase in the poaching of pangolin, but it is unknown if this is the continuation of a pre-

35. Neelaveni Padayachee and Lisa Claire du Toit, "Debunking 9 Popular Myths Doing the Rounds in Africa About the Coronavirus." *The Conversation*, April 13, 2020, <https://theconversation.com/debunking-9-popular-myths-doing-the-rounds-in-africa-about-the-coronavirus-135580>. See also: "High Level of Misinformation, Fake News About Coronavirus a Concern: Mkhize," SABC News, March 6, 2020, <https://www.sabcnews.com/sabcnews/high-level-of-misinformation-on-social-about-coronavirus-a-concern-mkhize/>.

36. Steven Broad, "Wildlife Trade, COVID-19 and Zoonotic Risks: Shaping the Response," TRAFFIC Briefing Paper, 2020. See also: Ross Harvey, "Covid-19: A 'Black Swan' Hiding in Plain Sight Has Important Lessons for SA," IOL, April 3, 2020, <https://www.iol.co.za/news/opinion/covid-19-a-black-swan-hiding-in-plain-sight-has-important-lessons-for-sa-46110460>. And: Bram Büscher, Giuseppe Feola, Andrew Fischer et al., "Planning for a World Beyond Covid-19: Five Pillars for Post-Neoliberal Development." *World Development* 140 (2021): 105357, <https://doi.org/10.1016/j.worlddev.2020.105357>.

37. Andrew Taylor, Peter Lindsey, and Harriet Davies-Mostert, *An Assessment of the Economic, Social and Conservation Value of the Wildlife Ranching Industry and Its Potential to Support the Green Economy in South Africa* (Johannesburg: The Endangered Wildlife Trust, 2016).

38. A.J. Clarke, and A. Babic, "Wildlife Trafficking Trends in Sub-Saharan Africa," in *Illicit Trade: Converging Criminal Networks* (Paris: OECD Publishing, 2015).

39. T. Nguyen, and D. L. Roberts, "Exploring the Africa-Asia Trade Nexus for Endangered Wildlife Used in Traditional Asian Medicine: Interviews with Traders in South Africa and Vietnam," *Tropical Conservation Science* 13 (2020). See also: Annette Michaela Hübschle, *A Game of Horns: Transnational Flows of Rhino Horn* (Cologne: IMPRS-SPCE, 2016).

40. African News Agency, "Rhino Export to Vietnam under Fire," IOL, Oct 4, 2016, <https://www.iol.co.za/dailynews/news/rhino-export-to-vietnam-under-fire-2075715>.

41. Sheree Bega, "Parrot Breeder Faces Criminal Charges for 'Horrendous' Conditions at Randburg Facility," IOL, March 7, 2020, <https://www.iol.co.za/saturday-star/news/parrot-breeder-faces-criminal-charges-for-and-quot-horrendous-and-quot-conditions-at-randburg-facility-44291374>.

42. Dina Fine Maron, "Poaching Threats Loom as Wildlife Safaris Put on Hold Due to COVID-19," *National Geographic*, April 10, 2020, <https://www.nationalgeographic.com/animals/2020/04/wildlife-safaris-halted-for-covid-boost-poaching-threat/>.

COVID-19 pattern or if it was impacted by lockdown. Elephant poaching in South Africa is relatively low at present, compared to other countries, but has been gradually increasing.⁴³ Formal markets for livestock and venison were allowed and continued during lockdown.

COVID-19 has seen an increase in some types of illegal and illicit wildlife crime and a decrease in others, locally and internationally.⁴⁴ There are indications that COVID-19 may also have increased demand for, and interest in, traditional medicine.⁴⁵ Lockdown restrictions, loss or reduction of income, and restricted movement appear to have increased demand for traditional medicines that are viewed as cheaper and locally accessible.⁴⁶ COVID-19 has also increased demand for bushmeat, with an increase in subsistence and commercially driven organized poaching. Reduced tourism income has contributed to decreased security and anti-poaching activities on game farms and reserves, facilitating an increase in poaching. This trend is also linked to a growing demand for bushmeat, not just as a cheap source of protein, but also from higher income earners as a luxury or social status product.⁴⁷ Stock theft has also been increasing, with links to criminal syndicates, and localized stock theft has increased during the pandemic.⁴⁸ There has been an increase in the harvesting of game meat by reserves and lodges to supply staff and local communities surrounding reserves and an increase in the commercial harvesting of game meat to supplement loss of income from hunting and tourism.⁴⁹

Ongoing, longstanding use and demand for traditional medicines continue and have increased due to positive growth in Asian economies and increased disposable income. New uses of wildlife products as a social status symbol are also growing. South Africa exports both live wild animals and products and derivatives to Asian countries.⁵⁰ Asian immigrant and African expatriate communities in South Africa drive some of the demand and supply, changes in supply chains, and usage patterns.⁵¹ The export of lion and other big cat products (bone, claws, and teeth, etc.) derived from hunting and captive breeding is highly contentious and has potential zoonotic risks.⁵² According to a 2007 study commissioned by the Department of Trade and Industry (DTI), more than 26 million South Africans

43. Matthew Savides, "Rhino Poaching Down, but It's Not Good News for SA's Elephants," Times Live, February 14, 2019, <https://www.timeslive.co.za/news/south-africa/2019-02-14-rhino-poaching-down-but-its-not-good-news-for-elephants/>.

44. Stefano Betti, "Public Health and Organised Crime: Preventing Future Outbreaks," RUSI, March 25, 2020, <https://shoc.rusi.org/blog/public-health-and-organised-crime-preventing-future-outbreaks/>.
See also: GI-TOC (Global Initiative Against Transnational Organized Crime), *Crime and Contagion: The Impact of a Pandemic on Organized Crime* (Geneva: Global Initiative Against Transnational Organized Crime, 2020), <https://globalinitiative.net/wp-content/uploads/2020/03/GI-TOC-Crime-and-Contagion-The-impact-of-a-pandemic-on-organized-crime-1.pdf>.

45. "Coronavirus and Rhino Horn" Save the Rhino, February 18, 2020, <https://www.savetherhino.org/Asia/china/coronavirus-and-rhino-horn/>.

46. Lesogo Makgatho, "Our Herbs Can Help With Covid-19, Say Traditional Healers," IOL, May 11, 2020, <https://www.iol.co.za/news/south-africa/gauteng/our-herbs-can-help-with-covid-19-say-traditional-healers-47793844>.

47. Reuter, Kim. "Eating Wild Animals: Commonplace, Cultural, Complicated." In *Conservation International Blog*. Virginia, USA: Conservation International, 2016

48. Malibongwe Dayimani, "Stock Theft Soars During Lockdown in Eastern Cape, to the Tune of R17m," News24, August 5, 2020, <https://www.news24.com/news24/southafrica/news/stock-theft-soars-during-lockdown-in-eastern-cape-to-the-tune-of-r17m-20200805#:~:text=of%20R17m%20%7C%20News24-,Stock%20theft%20soars%20during%20lockdown%20in%20Eastern,to%20the%20tune%20of%20R17m&text=The%20stolen%20animals%20included%204,411%20cattle%20and%2045%20horses.&text=The%20Eastern%20Cape's%20Safety%20MEC,27%20March%20and%2022%20June>.

49. Lloyd Phillips, "Game Reserves Turn to Meat Sales Amid COVID-19 Tourism Ban," Farmer's Weekly, July 20, 2020, <https://www.farmersweekly.co.za/agri-news/south-africa/game-reserve-turns-to-meat-sales-amid-covid-19-tourism-ban/>.

50. T. Nguyen and D. L. Roberts, "Exploring the Africa-Asia Trade Nexus for Endangered Wildlife Used in Traditional Asian Medicine: Interviews with Traders in South Africa and Vietnam," *Tropical Conservation Science* 13 (2020).

51. Sheree Bega, "Parrot Breeder Faces Criminal Charges for 'Horrendous' Conditions at Randburg Facility," IOL, March 7, 2020, <https://www.iol.co.za/saturday-star/news/parrot-breeder-faces-criminal-charges-for-and-quot-horrendous-and-quot-conditions-at-randburg-facility-44291374>.

52. Jennah Green et al., "African Lions and Zoonotic Diseases: Implications for Commercial Lion Farms in South Africa," *Animals* 10, no. 9 (2020): 1692, <https://doi.org/10.3390/ani10091692>.

use traditional medicine derived from wild plants and some animals.⁵³ The WHO Global Report on Traditional and Complementary Medicine 2019 states that 88% Member States have acknowledged their use of traditional and complementary medicine (T&CM), which corresponds to 170 member states, and that as of 2018, 40 of 47 African member states had national policies on T&CM.⁵⁴ While there has been increased access to conventional medical treatments, this appears to have been combined with an ongoing demand for traditional medicines and treatments. COVID-19, like HIV/AIDS, has increased interest in traditional medicines.⁵⁵ This appears to be relatively widespread in countries with high use of traditional medicines and bushmeat, and not limited to South Africa.⁵⁶

Prior to the COVID-19 lockdowns, the growing middle class was increasing demand for conventional meat products, including red meat and poultry.⁵⁷ Expanding poverty (exacerbated by the impacts of COVID-19) has now also fuelled the demand for cheap protein sources, driving formal and informal livestock markets, as well as practices associated with cheaper standards of production and handling, and thus also increased disease risks.⁵⁸ The financial hardships associated with the COVID-19 economic lockdown have resulted in a decreased ability to care for animals and subsequently increased levels of dumping, abandonment, and inadequate to negligent care of animals (wild, farm, and domestic), as well as increased levels of intentional cruelty and violence.⁵⁹ South Africa also has high levels of gender based and domestic violence, with associated links to animal cruelty.⁶⁰

MARKETS AND SUPPLY CHAINS

South Africa has a very diverse range of animal markets. These include formal, regulated markets in both domestic and wild animal species and a range of informal markets trading in an extensive range of animal species and animal parts. These informal markets are substantially unregulated, and where regulations do exist, enforcement is poor. There is little literature detailing the scope, function, and distribution of informal markets, and more research in this sector of the economy is indicated. The zoonotic disease risks in the informal market sector are similarly unquantified by research, but are not an express subject of regulatory concern.

53. Tony Carnie, "Animal Waste of Use to Muti Trade," Sunday Times: Business Times, October 7, 2018, <https://www.businesslive.co.za/bt/business-and-economy/2018-10-06-animal--waste--of-use-to-muti-trade/?&external>.

54. World Health Organization, *Global Report on Traditional and Complementary Medicine 2019* (Geneva: World Health Organization, 2019).

55. Lesogo Makgatho, "Our Herbs Can Help With Covid-19, Say Traditional Healers," IOL, May 11, 2020, <https://www.iol.co.za/news/south-africa/gauteng/our-herbs-can-help-with-covid-19-say-traditional-healers-47793844>.

See also: Dang Nguyen, "Traditional Medicine and Quest for Covid-19 Cure," YaleGlobal Online, April 28, 2020, <https://archive-yaleglobal.yale.edu/content/traditional-medicine-and-quest-covid-19-cure>.

56. Sheree Bega, "Asian Immigrants in South Africa, Traditional Asian Medicine and Wildlife Trade Hotspots," OSCAP - Outraged South African Citizens Against Rhino Poaching, September 16, 2017, <https://www.oscap.co.za/5595-2/>.

57. Marion Delpont et al., "Evaluating the Demand for Meat in South Africa: An Econometric Estimation of Short-Term Demand Elasticities." *Agrekon* 56, no. 1 (2017): 13–27.

58. CONTRALESA (Congress of Traditional Leaders of South Africa), "Public Hearing Inputs: Stakeholder Consultation on South Africa's Position Towards COP21, in Paris, France," PowerPoint Presentation, Accessed on September 26, 2023, <https://www.google.co.za/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiyhtueuIHuAhUEVRUIHWQkAwMQFJAKegQIBxAC&url=https%3A%2F%2Fpmpg.org.za%2F-files%2F150922CONTRALESA.pptx&usg=AOvVaw2i0IEzbbF9KkGYIWQrbl>.

59. "The COVID-19 Pandemic Leads to Increase in Animal Abuse and Abandonment: Here's Why," The Science Times, May 12, 2020, <https://www.sciencetimes.com/articles/25666/20200512/covid-19-pandemic-leads-increase-animal-abuse-abandonment-heres-why.htm>.

60. D. Kaminer and G. Eagle, *Traumatic Stress in South Africa* (Johannesburg: Wits University Press, 2010).

See also: Jade Weiner, "Covid-19 and Domestic Violence in South Africa," Oxford Human Rights Hub, April 26, 2020, <https://ohrh.law.ox.ac.uk/covid-19-and-domestic-violence-in-south-africa/.2020>. P

See also: Sarah Smit, "There Is Heartbreak Every Day," Mail & Guardian, May 14, 2020, <https://mg.co.za/coronavirus-essentials/2020-05-14-there-is-heartbreak-every-day/>.

See also: Brinda Jegatheesan et al., "Understanding the Link between Animal Cruelty and Family Violence: The Bioecological Systems Model," *International Journal of Environmental Research and Public Health* 17, no. 9 (2020): 3116, <https://doi.org/10.3390/ijerph17093116>.

In some respects, South African animal markets mirror markets in Western democracies (extensive, vertically integrated livestock production controlled by an oligarchy of corporate entities). In addition to formal markets for domestic and wild animals, there are many informal livestock and wildlife markets, with uses and supply chains that vary in length, relative profits, and value of the products.⁶¹ These informal markets vary considerably in the size and composition of the supply chains, numbers of people involved, economic distribution, market share, and relative value of products.⁶² Formal markets will have state-funded infrastructure (hard surfacing, stalls, and maybe some utilities like water and/or electricity, waste removal, etc.), whereas an informal market is one where the traders collectively occupy an open space, often near a transport interchange, and provide their own facilities like tables or racks. Informal markets are not serviced by a branch of government. Informal markets sell a range of goods, typically foodstuffs including animal parts and products, clothing, cell-phone accessories, etc. They are further described as those that “escape effective health and safety regulation, are often untaxed and unlicensed, and where traditional processing, products and prices predominate.”⁶³ Traditional African markets sell products of uniquely indigenous value, such as animals, body parts, and plants for traditional medicine uses.

South Africa is also unique in the scale, complexity, and maturity of its consumptive wildlife industry, as well as in the state support for this element of the ‘Biodiversity Economy.’⁶⁴ The aggressive lobbying by industry stakeholders to recategorize many species of wild animals as domesticated has also facilitated further commercial exploitation.⁶⁵

South Africa does not have the equivalent of the large-scale ‘wet markets’ associated with China and other parts of Asia. Instead, there are some markets where live animals are held for sale, specifically chickens and goats. Chickens are also transported informally, e.g., live chickens in boxes or packets in taxis. Open-air butchers also sell fresh meat along roadsides and markets. In coastal areas, fish markets sell fish and seafood. Due to the variety, extent, and unregulated nature of the informal markets, the exact number and location of all trading locations are difficult to quantify and characterize, and conditions vary considerably. The level of zoonotic risk, monitoring, mitigation, regulation, control, and enforcement also varies wildly, depending on the type of market and supply chain.⁶⁶ The longer the supply chain and the greater the interface between animal and human, the greater the risk. The illegal, illicit, and unregulated supply chains carry higher risks.⁶⁷

There is considerable movement of both people and products, including bushmeat and animal parts for traditional medicine and cultural rituals between urban and rural areas, going in both directions.

61. Jason Bantjes, Leslie Swartz, and Sithembile Cembali, “Our Lifestyle Is a Mix-Match’: Traditional Healers Talk About Suicide and Suicide Prevention in South Africa,” *Transcultural Psychiatry* 55, no. 1 (2018): 73–93.

62. Andrew Taylor, Peter Lindsey, and Harriet Davies-Mostert, *An Assessment of the Economic, Social and Conservation Value of the Wildlife Ranching Industry and Its Potential to Support the Green Economy in South Africa* (Johannesburg: The Endangered Wildlife Trust, 2016).

63. Kristina Roesel and Delia Grace(eds), *Food Safety and Informal Markets: Animal Products in Sub-Saharan Africa* (Abingdon-on-Thames: Routledge, 2014).

64. DEA. “What Is the Biodiversity Economy?” DEA, 2021. [http://thegamechanger.co.za/home/biodiversity/what-is-the-biodiversity-economy/#:~:text=The%20biodiversity%20economy%20\(bio-prospecting%20and%20wildlife\)%20of%20South,contribute%20to%20conservation%20of%20biodiversity%20through%20their%20activities.](http://thegamechanger.co.za/home/biodiversity/what-is-the-biodiversity-economy/#:~:text=The%20biodiversity%20economy%20(bio-prospecting%20and%20wildlife)%20of%20South,contribute%20to%20conservation%20of%20biodiversity%20through%20their%20activities.)

65. Don Pinnock, “SA Reclassifies 33 Wild Species as Farm Animals,” *Daily Maverick*, October 16, 2019, <https://www.dailymaverick.co.za/article/2019-10-16-sa-reclassifies-33-wild-species-as-farm-animals/>.

66. M. Ngcobo et al., “Recommendations for the Development of Regulatory Guidelines for Registration of Traditional Medicines in South Africa,” *African Journal of Traditional, Complementary, and Alternative Medicines* 9, no. 1 (2012): 59–66.

67. K. A. Murray et al., “Emerging Viral Zoonoses from Wildlife Associated with Animal-Based Food Systems: Risks and Opportunities,” in *Food Safety Risks from Wildlife: Challenges in Agriculture, Conservation, and Public Health*, edited by M. Jay-Russell and M. Doyle (Cham: Springer, 2016).

The minivan taxi acts as a major conduit for movement of persons and goods. The traffic of bushmeat and traditional medicine parts is primarily from rural to urban areas. Many city dwellers who still have strong traditional ties and beliefs may return to rural areas to seek out traditional cures and remedies. It is worth noting that the rural-urban land use patterns were strongly influenced by apartheid-era practices, racial residential segregation, and racially-based labour policies, and that the spatial impacts of apartheid persist in the contemporary South African built landscape.⁶⁸ Furthermore, in South Africa, there is a “strong interdependence between rural communities and distant cities, with many rural residents living in urban domains while maintaining family, social and financial ties in rural areas.”⁶⁹ This introduces an important discussion of South Africa’s urban and semi-urban environments.⁷⁰

Cities and towns are typically characterised by low density formal housing suburbs, with free-standing houses, housing estates, or apartments. These areas are inhabited by middle to upper income residents and are usually characterized by good infrastructure and services, with formal trading and/or shopping amenities. Within or adjacent to the cities, small towns and formally proclaimed suburbs are lower income housing developments. These are formally proclaimed settlements, but increasingly exhibit mixed market access and land use patterns typically trending towards informal retail. Some metropolitan areas have growing high-density inner-city slum-type dwellings characterized by overcrowding and limited access to sanitation and services. Consumers living in these areas utilize a combination of formal shopping, trading, and services, with many informal traders supplying goods and services including meat (wild and domestic), and traditional healing needs. Residents in these areas include low-income immigrant communities (legal and illegal) and people who migrate to urban areas either permanently or as weekly or long-haul commuters who work in a town or city and go home to the rural area during long weekends or holidays.

There are also more than 2,700 informal settlements (shanty towns) nationwide. The number of households in these informal settlements increased from 1,170,902 to 1,294,904 between 1995 and 2011.⁷¹ These settlements feature high-density, unplanned, shack-type dwellings, with few services and little to no formal sanitation. Their supply side features a large, informal, unregulated trading sector for slaughter, processing of meat, informal food vendors, and traditional medicine traders. The settlements impose risks and cumulative impacts on the wellbeing and health of the residents.⁷² The government identified informal settlement upgrades as “a key area of focus for human settlement development, with the objective to make these areas habitable and conducive to raising families by prioritising the provision

68. Alan Mabin, “The Impact of Apartheid in Rural Areas of South Africa,” *Antipode* 23, no. 1 (2006): 33–46. DOI:10.1111/j.1467-8330.1991.tb00401.x. Rebecca Fogel, “Informal Housing, Poverty, and Legacies of Apartheid in South Africa,” *Urban@UW*, University of Washington, July 11, 2019, <https://urban.uw.edu/news/informal-housing-poverty-and-legacies-of-apartheid-in-south-africa/>.

Clare T. Romanik, *An Urban-Rural Focus on Food Markets in Africa* (Washington DC: The Urban Institute, 2008), <https://www.urban.org/sites/default/files/publication/31436/411604-An-Urban-Rural-Focus-on-Food-Markets-in-Africa.PDF>.

B. Van Schalkwyk, C. Schoeman, and J. Cilliers, “The Interface Between Rural Communities in South Africa and Their Urban Counterparts: The Significance for Sustainable Rural Community Development in the Vaalharts Area,” *WIT Transactions on Ecology and the Environment* 191 (2014): 453–62, DOI:10.2495/SC140381.

69. B. Van Schalkwyk, C. Schoeman, and J. Cilliers, “The Interface Between Rural Communities in South Africa and Their Urban Counterparts: The Significance for Sustainable Rural Community Development in the Vaalharts Area,” *WIT Transactions on Ecology and the Built Environment* 191 (2014): 453–62, DOI:10.2495/SC140381.

70. Doreen Atkinson, *Rural-Urban Linkages: South Africa Case Study Working Paper Series No. 125*, Working Group: Development with Territorial Cohesion, (Santiago: RIMISP, 2014).

71. “Informal Settlements,” *Parliamentary Monitoring Group*, accessed September 28, 2023, <https://pmg.org.za/page/Informal%20Settlements>.

72. Alexandre Zerbo, Rafael C. Delgado, and Pedro A. González, “Vulnerability and Everyday Health Risks of Urban Informal Settlements in Sub-Saharan Africa,” *Global Health Journal* 4, no. 2 (2020): 46–50, doi:<https://doi.org/10.1016/j.glohj.2020.04.003>.

of basic infrastructure, services and land tenure for informal settlement households.”⁷³

Rural areas include formal agriculture and subsistence agricultural practices. Most rural subsistence communities are poor. Higher income attends more formal agriculture and game farming.⁷⁴ Traditional tribal communities are usually low- to medium-density, with increasing numbers of Western-type brick-built housing. In these areas, subsistence and community farming are served by rural trade posts, bartering, and a high dependence on traditional medicine and healers. There is both legal and illegal hunting and harvesting of wild species for meat and for medicinal and cultural purposes. Some smaller wild species still occur in these rural communities, and these are harvested by hunting dogs, snaring, and trapping. Where these communities border on game reserves and game farms, there is a lot of illegal poaching, snaring, trapping, and dog hunting (including taxi hunts). There is a wide variation in species harvested, and animals and body parts used for both subsistence and commercial trade. Increasingly, poaching syndicates are operating across rural areas, seeking higher value game and products like rhino horn and pangolin.⁷⁵ There are developing mid-to high-density communities along the borders of some of the major game reserves (Kruger Park, Hluhluwe Umfolozi), which translates into increasing impacts on protected areas.

The game ranching industry is formally organized and extensively regulated. The industry manages animals in nature reserves, ranches, captive wildlife centres (for both breeding and/or display and interaction), rehabilitation centers, and sanctuaries through a system of permits that restrict possession and seek to manage the movement of animals. However, the regulations are not comprehensive for all species and in all contexts, and not all market contexts are transparent. There is a local differentiation between wildlife ranching and wildlife farming, with a wide diversity of operations and activities within these two groupings. Wildlife ranching is generally more extensive, in larger areas, with a mix of game species and less direct management or interference with the animals. Wildlife farming is similar to domestic livestock farming and occurs in smaller areas, with mixed or individual species, and is often intensively managed via, for example, the manipulation of breeding for colour variance, etc., the removal of calves/cubs to encourage oestrus, and more frequent breeding. Species interaction and zoonotic disease risks vary considerably according to species, handling, and human interaction levels. Generally, smaller, more intensive operations with higher levels of human interference pose higher zoonotic disease risks (similar to livestock production). The more intensive this game farming becomes, the greater the need for vaccinations and routine use of antibiotics and growth promoters.⁷⁶

Recent proposed amendments to the Meat Safety Act and advancement of the Game Meat Regulations are seeking to regulate the slaughter of wild animals for meat and other products, and these

73. Alexandre Zerbo, Rafael C. Delgado, and Pedro A. González, “Vulnerability and Everyday Health Risks of Urban Informal Settlements in Sub-Saharan Africa,” *Global Health Journal* 4, no. 2 (2020): 46–50, doi:<https://doi.org/10.1016/j.glohj.2020.04.003>.

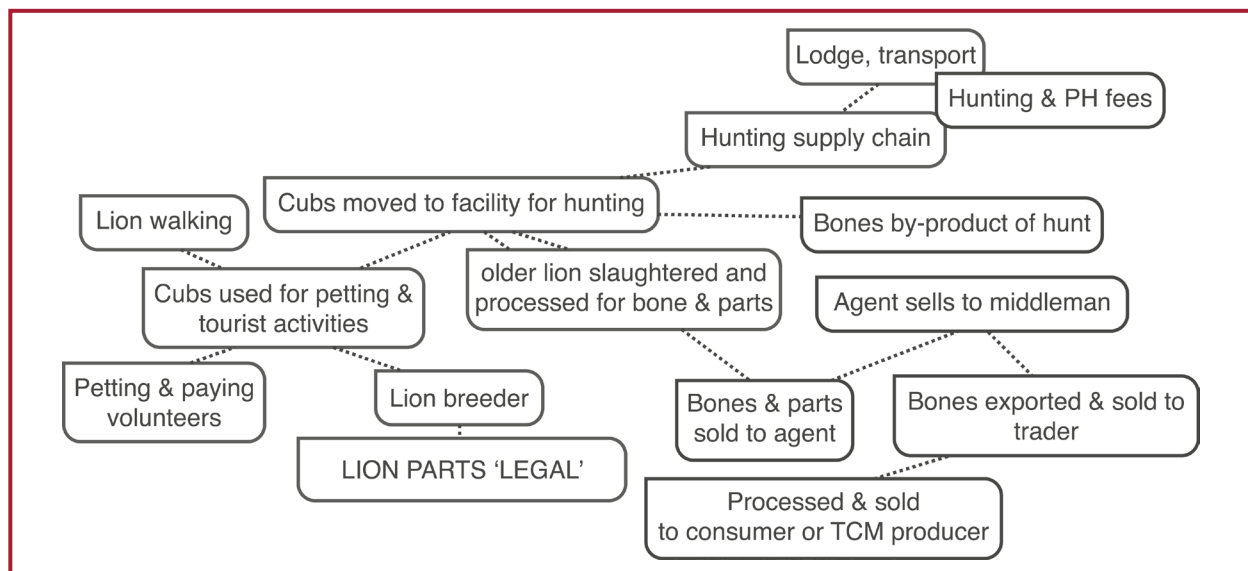
74. Doreen Atkinson, *Rural-Urban Linkages: South Africa Case Study*, Working Paper Series No. 125, Working Group: Development with Territorial Cohesion (Santiago: RIMISP, 2014).

75. Jaime Chambers, “What Drives Illegal Hunting with Dogs? Traditional Practice in Contemporary South Africa,” *Ethnobiology Letters* 11, no. 1 (2020): 25–8, <https://doi.org/10.14237/eb.11.1.2020.1645>.

76. Additional definitions of categories such as breeding camp, extensive wildlife ranching, and intensive breeding in the South African context can be found in Andrew Taylor, Peter Lindsey, and Harriet Davies-Mostert, *An Assessment of the Economic, Social and Conservation Value of the Wildlife Ranching Industry and Its Potential to Support the Green Economy in South Africa* (Johannesburg: The Endangered Wildlife Trust, 2016).

practices and the efforts at regulation of them will impact on zoonotic disease risk.⁷⁷ The Meat Safety Act refers to slaughter and handling for consumption and commercial purposes, and includes a number of wild species. The Animals Improvement Act allows for the manipulation of breeding; a number of wild species are also listed under this Act (the amendments and additions of these species are currently being challenged legally).⁷⁸ The process is still underway and includes animals like the lion, cheetah, and rhino. The Meat Safety Act includes a number of exotic, wild, and domestic species such as water buffalo, goat, pig, wildebeest, porcupine, crocodile, antelope, and so on.⁷⁹ It also applies to all other species, including birds, fish, and reptiles that are slaughtered for human and animal consumption.

One of the higher-zoonotic-risk (and controversial) intensive wildlife breeding industries is the captive lion industry, which presents risks throughout the entire chain, from breeding to slaughter, processing, and sale of body parts. Sixty-three pathogens, including bacteria, viruses, and parasites, with the potential to affect both wild and captive lions, were identified, with a study listing eighty-three diseases and clinical symptoms associated with these pathogens.⁸⁰ This industry poses potential health risks to tourists, volunteers, farm workers and their families, and end users of the lion products.⁸¹ A map of the supply chain:



77. See, for example: GAME SA, Game Meat Regulations, April 18, 2018, https://www.gamesa.co.za/_files/ugd/fbc7b7_aba7c4ade4b745b195395fd2c1acb0dd.pdf. And also: Republic of South Africa, "Meat Safety Act (No. 40 of 2000)," Government Gazette, November 1, 2000, https://www.gov.za/sites/default/files/gcis_document/201409/a40-000.pdf. Louwrens C. Hoffman, Monlee Swanepoel, and Alison J. Leslie, "1. African Game Meat and the Safety Pertaining to Free-ranging Wildlife: Example of a Wild Suid in South Africa," in *Game Meat Hygiene: Food Safety and Security*, edited by P. Paulsen, A. Bauer, and F. J. M. Smulders (Wageningen: Wageningen Academic Publishers, 2017), 17–50. Johan L. Bekker, Louw C. Hoffman, and Piet J. Jooste, "Wildlife-associated Zoonotic Diseases in Some Southern African Countries in Relation to Game Meat Safety: A Review," *Onderstepoort Journal of Veterinary Research* 79, no. 1 (2012): E1–E12, <http://dx.doi.org/10.4102/ojvr.v79i1.422>.
78. "Animal Improvement Act, 1998," Centre for Environmental Rights, November 21, 2003, <https://cer.org.za/virtual-library/legislation/animal-improvement-act-62-of-1998>. See also: Don Pinnock, "SA Reclassifies 33 Wild Species as Farm Animals," *Daily Maverick*, October 16, 2019, <https://www.dailymaverick.co.za/article/2019-10-16-sa-reclassifies-33-wild-species-as-farm-animals/>.
79. Full list available at: Republic of South Africa, Department of Agriculture, Forestry and Fisheries, "Publication for Information and for Public Comments," Government Gazette, February 28, 2020, <https://cer.org.za/wp-content/uploads/2020/04/Proposed-Amendment-to-Meat-Safety-Act-Comment-due-by-28-April-2020.pdf>.
80. Jennah Green et al., "African Lions and Zoonotic Diseases: Implications for Commercial Lion Farms in South Africa," *Animals* 10, no. 9 (2020): 1692, doi:10.3390/ani10091692.
81. Jennah Green et al., "African Lions and Zoonotic Diseases: Implications for Commercial Lion Farms in South Africa," *Animals* 10, no. 9 (2020): 1692, doi:10.3390/ani10091692.

The market for lion body parts is perhaps the best understood, since the captive lion breeding industry is a matter of significant public concern and has received widespread public attention. Some 400 commercial facilities breed lions for tourism interaction, hunting, and their body parts, though the identities, exact nature, and scale of these operations are not easily determined. The government does not make this information available, despite the statutory requirement that such facilities be permitted.⁸² As of the time of writing, South Africa has held a parliamentary colloquium on closing the industry, the lion bone export quota has been challenged in court, and the industry has been a key focus of a ministerial high level advisory panel considering management policy for leopards, lions, elephants, and rhinos. Despite this, researchers in the trade in lions and lion body parts acknowledge that current knowledge is inadequate and that further study is required.⁸³ Williams et al. note that, “There is therefore a necessity for information sharing and consolidation, trade monitoring, and risk assessment in all countries. But while this survey identified some trade hotspots and the motives for utilisation and demand, it could not identify all the supply chain participants and their motives.”⁸⁴ Furthermore, the authors indicate the need for a better understanding of the drivers for the supply, suggesting that their survey and the prioritization of countries for immediate attention was a first step towards this.⁸⁵ However, since this paper was published, the industry has pivoted from regarding bone and other parts as a by-product to focusing on producing these as a primary product. This not only has severe consequences for wild lions, but also highlights the shifting and dynamic nature of markets and supply chains for wildlife products in South Africa.⁸⁶

The other markets that trade in animals and animal parts generally lack formal regulation and are significantly less well understood than the formal domestic and wildlife industries. In some cases, more information is available now. For example, there is a growing demand for vulture parts.⁸⁷ The killing of vultures, usually by mass poisoning, and the harvesting of parts for traditional medicine, is prevalent in South Africa and neighbouring countries and is considered a growing and significant threat to vulture populations. Overall, the multiplicity of contexts, products sold, and uses that animals and animal parts are put to speaks to the urgent need for further research, as there is little current reliable information available.

To illustrate the urgency of current demands for such research and to contextualize the varieties of wildlife use in South Africa presenting zoonotic risk, an example of human–animal interactions is the poaching of wildlife with dogs. A warthog is chased and attacked by dogs. Poachers then move in with spears to kill the warthog. The dogs may be injured during the hunt. Poachers’ dogs are usually kept hungry to encourage the chase and hunting instinct. The poor welfare of the hunting dogs increases the risks of disease to dogs and the spread to humans of tick-borne or parasitic diseases. 85% of South Africans cannot afford primary veterinary health care, meaning that most rural dogs are not vaccinated.

82. Andreas Wilson-Spath, “It’s High Time SA Shut Down the Captive Lion Breeding Industry,” *Daily Maverick*, October 12, 2020, <https://www.dailymaverick.co.za/article/2020-10-12-its-high-time-sa-shut-down-the-captive-lion-breeding-industry/>.

83. Vivienne L. Williams et al., “Questionnaire Survey of the Pan-African Trade in Lion Body Parts,” *PLoS ONE* 12, no. 10 (2017): e0187060.

84. Vivienne L. Williams et al., “Questionnaire Survey of the Pan-African Trade in Lion Body Parts,” *PLoS ONE* 12, no. 10 (2017): e0187060.

85. Vivienne L. Williams et al., “Questionnaire Survey of the Pan-African Trade in Lion Body Parts,” *PLoS ONE* 12, no. 10 (2017): e0187060.

86. Sheree Bega, “Bone Trade Huge Threat to Wild Lions,” *IOL*, July 21, 2018, <https://www.iol.co.za/saturday-star/opinion/bone-trade-huge-threat-to-wild-lions-16166056>.

87. María Paula Rubiano A., “Growing Demand for Vulture Heads Threatens Birds’ Survival in Africa,” *Audubon*, April 12, 2021, <https://www.audubon.org/news/growing-demand-vulture-heads-threatens-birds-survival-africa>.

Rabies is thus an additional risk to people and animals alike when dogs encounter infected wildlife.⁸⁸ Warthogs are also asymptomatic carriers of African swine fever, which can then be transmitted to domestic pig stock when the two species are mixed in the field or holding pens or when pigs encounter contaminated meat. And as research suggests, “[a]round 60% of all human pathogens are zoonoses that are equally harboured by domestic and wild animals. And of the emerging infectious diseases, 75% of these are zoonoses predominantly associated with wildlife animals, thus clearly highlighting an increasing threat arising from these animal species.”⁸⁹ Furthermore, both domestic and wild carnivore species are commonly diagnosed with rabies virus (RABV) infection in South Africa.⁹⁰ The Lyssavirus infection was confirmed in two wild dogs (*Lycaon pictus*) and a spotted hyena (*Crocuta crocuta*) in the Madikwe Game Reserve, the northwest province in South Africa, in 2014 and 2015.⁹¹ It was found that the most likely rabies sources were boundary fence contacts between wild carnivores within the park and domestic dogs or cats and/or naturally occurring wild carnivores outside the park. Thus, humans and animals need not physically come into contact; their spatial positioning may be enough to approximate mixing of wild and domestic species.

Livestock Animal Markets

The formal market for producing, distributing and retailing animal products produced for the retail food sector is a vertically integrated corporate food system operating on an international scale. Many aspects of the supply chain are highly regulated, with the regulatory focus on maintaining human health.⁹² Despite widespread publicity and scientific comment on the risk of zoonotic disease from industrial scale animal production, there has not been a formal regulatory response to this identified danger.⁹³ Livestock animal species are raised and traded in the following contexts:

- Formal agricultural livestock farming for meat and produce and associated activities (farms, sale yards, abattoirs; intensive, semi-intensive, extensive, free-range, organic).
- Informal farming systems including small-holder farmers, subsistence farmers, and peri-urban farmers raising a range of species, depending on location. There is often little physical separation between living areas and animal husbandry spaces.
- Animals traded for formal religious and cultural slaughter outside the abattoir system (e.g., *Qurbani*). These animals are usually sourced from sale yards, farms, and small holders (this also includes species like camel).
- Informal/home/domestic slaughter and utilization with local markets, stockyards, and direct personal trading or use.

88. Regarding veterinary healthcare in South Africa, see: SAVA (South African Veterinary Association), accessed September 28, 2023, www.sava.co.za.

89. Kudakwashe Magwedere, “Zoonoses: a Potential Obstacle to the Growing Wildlife Industry of Namibia,” *Infection Ecology & Epidemiology* 2 (2012): 18365, doi:10.3402/iee.v2i0.18365.

90. Claude T. Sabeta et al., “Rabies of Canid Biotype in Wild Dog (*Lycaon pictus*) and Spotted Hyaena (*Crocuta crocuta*) in Madikwe Game Reserve, South Africa in 2014–2015: Diagnosis, Possible Origins and Implications for Control,” *Journal of the South African Veterinary Association* 89 (2018): a1517, <https://doi.org/10.4102/jsava.v89i0.1517>.

91. Claude T. Sabeta et al., “Rabies of Canid Biotype in Wild Dog (*Lycaon pictus*) and Spotted Hyaena (*Crocuta crocuta*) in Madikwe Game Reserve, South Africa in 2014–2015: Diagnosis, Possible Origins and Implications for Control,” *Journal of the South African Veterinary Association* 89 (2018): a1517, <https://doi.org/10.4102/jsava.v89i0.1517>.

92. See for example the Meat Safety Act Regulations, which can be accessed at <https://www.gov.za/documents/meat-safety-act-regulations-red-meat-0>

93. Humane Society International, *An HSI Report: The Connection between Animal Agriculture, Viral Zoonoses, and Global Pandemics* (Avalon: Humane Society International Australia, 2020), <https://hsi.org.au/wp-content/uploads/2022/01/Animal-agriculture-viral-disease-and-pandemics-FINAL-4.pdf>.

- Traditional, religious, and cultural slaughter (at different local scales, from home, village and community) with local markets, stockyards, and direct personal trading or use. This practice is increasingly taking place in urban and semi-urban residential areas and allowed under traditional practices with mixed regulation and controls by local councils and municipalities.
- Illegal trade in farmed animals, including cattle rustling and animal theft (goats and sheep) for personal consumption and processing into formal and informal value chains through backyard slaughter and sale.⁹⁴ This is a growing criminal activity, sometimes linked to criminal syndicates and taxi owners; they are increasingly well organized and this activity may involve a few animals or large-scale stock theft with trucks and removal of entire herds.

Formal trade in animals for food and fiber: South Africa's food supply is dominated by a mature, formalized corporate food system.⁹⁵ It raises, kills, processes, and distributes 1.1 billion farm animals annually. One billion of these are broiler chickens.⁹⁶ The others are predominantly cows, sheep, pigs, and goats.⁹⁷ Only a fraction of the chickens are traded in any formal physical market, and then it is usually only end-of-laying hens sold into informal urban or peri-urban meat markets.⁹⁸ There is also a widely distributed network of farms, stockyards, feedlots, slaughter houses, and auction facilities processing other species of farmed animals. This market for farmed animal products makes provision for formal religious and cultural slaughter practices at abattoirs (e.g., halal and kosher). This intensive network of producing animal products lends itself to the same disease risks that manifest in developing countries, and South Africa has experienced recent outbreaks of listeriosis, African swine fever, and avian flu.⁹⁹

Informal and formal local farming trade and slaughter: In many rural communities in South Africa, small farms still breed, trade, and slaughter domestic animals for local use and to supply a local commercial requirement. This network includes local markets, stockyards, and local abattoirs, as well as traditional, religious, and cultural slaughter (local, domestic, and community). The zoonotic disease risks in this market sector have been identified as material.¹⁰⁰ This may vary from a very informal local trade, with direct purchases between consumer and owner, to monthly village market-type situations with temporary or simple infrastructure and trade from the back of a light delivery vehicle (LDV), to more organized stock- or sale yards.

94. Malibongwe Dayimani, "Stock Theft Soars During Lockdown in Eastern Cape, to the Tune of R17m," News24, August 5, 2020, <https://www.news24.com/news24/southafrica/news/stock-theft-soars-during-lockdown-in-eastern-cape-to-the-tune-of-r17m-20200805#:~:text=of%20R17m%20%7C%20News24-,Stock%20theft%20soars%20during%20lockdown%20in%20Eastern,to%20the%20tune%20of%20R17m&text=The%20stolen%20animals%20included%204,411%20cattle%20and%2045%20horses.&text=The%20Eastern%20Cape's%20Safety%20MEC,27%20March%20and%2022%20June>.

95. The Agri Handbook for South Africa, 6th Edition (Johannesburg: SAHB Publishing [Pty] Ltd, 2018), 133–135.

96. South African Poultry Association, 2018 Industry Profile, 2019: 52

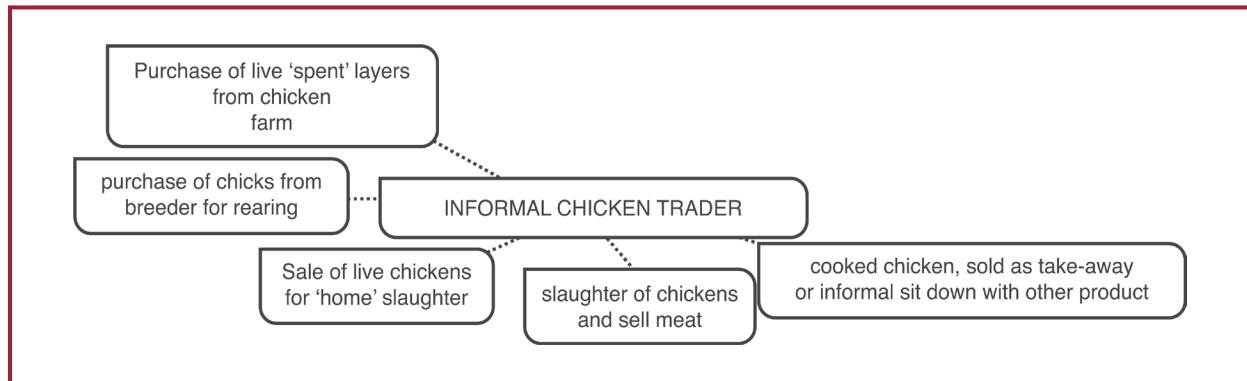
97. Department of Agriculture Land Reform and Rural Development, Livestock Numbers From 1996 to Current, www.dalrrd.gov.za

98. South African Poultry Association: 52

99. NICD (National Institute for Communicable Diseases), "An Update on the Outbreak of *Listeria monocytogenes*, South Africa," Communicable Diseases Communiqué 17, no. 8 (20189): 4–6, <https://www.nicd.ac.za/wp-content/uploads/2018/08/An-update-on-the-outbreak-of-Listeria-monocytogenes-South-Africa.pdf>.

Makgopa, Makoma. "Outbreak of African Swine Fever in South Africa's Eastern Cape Province." United States Department of Agriculture Foreign Agricultural Service, June 2, 2020, https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Outbreak%20of%20African%20Swine%20Fever%20in%20South%20Africa%27s%20Eastern%20Cape%20Province_Pretoria_South%20Africa%20-%20Republic%20of_05-18-2020. Leana Janse van Rensburg et al., "Understanding African Swine Fever Outbreaks in Domestic Pigs in a Sylvatic Endemic Area: The Case of the South African Controlled Area between 1977–2017," *Transboundary and Emerging Diseases* 67, no. 6 (2020): 2753–69. Ziyaad Valley-Omar et al., "Human Surveillance and Phylogeny of Highly Pathogenic Avian Influenza (H5N8) During an Outbreak in Poultry in South Africa, 2017," *Influenza and Other Respiratory Viruses* 14, no. 3 (2020): 266–73.

100. See, for example: Nenene Daniel Qekwana and James Wabwire Oguttu, "Assessment of Food Safety Risks Associated with Preslaughter Activities During the Traditional Slaughter of Goats in Gauteng, South Africa," *Journal of Food Protection* 77, no. 6 (2014): 1031–7.



Home or personal slaughter and consumption of livestock: Domestic animals are still kept in both rural and urban contexts for personal consumption. They are usually slaughtered and consumed on private property. These animals are typically not raised using intensive production methodologies.

Formal religious and cultural slaughter outside abattoir system: This includes religious or cultural slaughter and processing carried out at specific non-formal slaughter sites or domestic situations for religious events, not at established abattoirs, that may or may not be overseen by clerics and/or welfare inspectors, e.g., Qurbani.

High-density urban area and informal settlement markets and traders: Many South African cities have formal and informal housing. The informal settlements are typically unplanned and generally un-serviced, and these communities develop local distribution networks and markets to supply animal products to the residents. This trade is largely unregulated, deals extensively in live animals, and is characterized by the slaughter, processing, and consumption of animals without formal facilities or state oversight. Chickens and other small livestock are the most typical products, but meat, parts, and cooked products from larger animals like cattle are also evident. The conditions in these markets could be likened to the wet markets, with significant animal and human health risks.

Wildlife Markets

There are a variety of wildlife trading environments in South Africa:

1. Formal venison/wildlife product industry. Venison is harvested in the field. The industry includes ranches, game farms, auctions, quarantine facilities, etc.
2. Formal breeding in intensive and semi-intensive operations for live trade, hunting, and derivatives. This includes the captive lion industry, rhino farming (local and export trade), exotic and indigenous bird and reptile breeders, crocodile and ostrich industries.

3. Recreational hunting for venison, biltong, and trophies. Animals for this purpose are increasingly intensively farmed in production-like situations on game or wildlife farms. Animals may also be marketed/traded via live or virtual auctions.
4. Harvesting for venison at lodges and on game reserves (staff, community, and tourist consumption). Game is harvested in small numbers by staff as required.
5. Roadside traders in rural areas and small towns. Wildlife meat, usually illegally harvested/poached, is sold roadside in informal wooden stalls, crates, or LDVs.
6. Bushmeat. This is subsistence hunting, or poaching where it is illegal.
7. Bushmeat and wildlife hunting for commercially traded meat and parts. Taxi-hunts and wildlife/stock theft are increasingly linked and well-organized.
8. Wildlife and traditional markets supplying traditional medicine and healer applications of wildlife and domestic meat and parts. Points of sale vary considerably and range from direct sale from the homestead of a traditional healer in a rural village to roadside trade, taxi-ranks, and markets.
9. Poaching and illegal supply chains for high value animal derivatives like rhino horn and pangolin. Illicit and underground, through well-established networks, they move product from wild areas and reserves to urban areas where dealers and middlemen distribute to couriers for export out of the country, usually to Asian markets.¹⁰¹
10. “Muthi” for traditional medicine/healers (includes shops and private, informal practices for which wildlife products and sometimes live wildlife are traded and utilized). Traditional healers may range from the old-fashioned rural healers to more modern urban healers.¹⁰² Vivienne Williams, an ethnobotanist and ethnozoologist at the University of the Witwatersrand in Johannesburg, states that the wildlife trade for traditional medicine (also called “belief use”) has “a bigger impact than the ivory trade, and the rhino trade, and the lion trade,” and that muthi poses a substantial conservation threat of its own.¹⁰³ According to Williams, more than 147 species of vertebrates, including 17 threatened species, have been found for sale in a major medicine market in Johannesburg.¹⁰⁴
11. Sourcing animal parts for “Witchcraft.”¹⁰⁵ Animal parts are sourced from poached wildlife, domestic stock, and deliberate poisonings of secondary species such as vultures.¹⁰⁶

Taxi-ranks, as they are known in South Africa, are widespread due to the very large microbus taxi industry and poor public transport. The taxi-ranks are in some cases simply informal areas where

101. Jani Hall, “Poaching Animals, Explained,” National Geographic, February 12, 2019, <https://www.nationalgeographic.com/animals/article/poaching-animals>.

102. Sibusiso Mkwanazi, “Can Muthi Fix Your Love Life? Happy Clients are All the Proof This herbalist needs,” Sunday Times, March 7, 2021, <https://www.timeslive.co.za/sunday-times/lifestyle/2021-03-07-can-muthi-fix-your-love-life-happy-clients-are-all-the-proof-this-herbalist-needs/>.

103. Cathleen O’Grady, “Traditional Medicine, Treatments Now Threaten South Africa’s Vultures,” The Wire, October 31, 2019, <https://thewire.in/environment/south-africa-vultures>.

104. Cathleen O’Grady, “Traditional Medicine, Treatments Now Threaten South Africa’s Vultures,” The Wire, October 31, 2019, <https://thewire.in/environment/south-africa-vultures>.

105. Isak Niehaus, “Witchcraft as Subtext: Deep Knowledge and the South African Public Sphere,” *Social Dynamics* 36, no. 1 (2010): 65–77, doi:10.1080/02533950903561247.

106. Joseph Onoja, “Working with Traditional Healers to End Vulture Poaching,” BirdLife International, June 10, 2020, <https://www.birdlife.org/news/2020/06/10/working-with-traditional-healers-to-end-vulture-poaching/>.

“Mass Poisoning Kills at Least 27 Vultures in Zululand,” Vulture Conservation Foundation, June 14, 2019, <https://4vultures.org/blog/mass-poisoning-kills-at-least-27-vultures-in-zululand/>.

“WATCH Critically Endangered Vultures Released After Mass Poisoning in South Africa,” SApeople News, July 1, 2020, <https://www.sapeople.com/2020/07/01/watch-critically-endangered-vultures-released-after-mass-poisoning-in-south-africa/>.

taxis gather while waiting for commuters during quiet times and working hours. This may just be a sand area on the side of the road, with no infrastructure, or may be an officially allocated area in the bigger cities where some services and infrastructure are provided. Street or informal vendors set up stands within the taxi-rank selling a range of items, from food to clothes and, in some cases, bushmeat, domestic meat, live chickens, and plant and animal parts for traditional medicine. Approximately 45% of livestock is marketed through informal channels, and “the cross-over segment between the informal and formal marketing chain and the food safety risk of informally marketed meat is unknown.”¹⁰⁷ Unlike the traditional Western taxis that one hails on demand, with the commuter determining the destination and route, minivan taxis have set (and strongly contested and defended) routes. Thus, the commuter either goes to a taxi-rank or hails the taxi along the established route.

Wildlife Industry (venison and other wildlife products): South Africa has one of the largest and most rapidly growing commercialized and increasingly intensified wildlife industries in the world, incorporating both indigenous and exotic species.¹⁰⁸ A wide range of wildlife species are used for venison meat and hide products, and are typically harvested in the field. A substantial industry network of ranches, game farms, auctions, transport, and quarantine facilities, etc., has sprung up, and the industry has developed intensive and semi-intensive breeding practices to satisfy a wide range of market niches.¹⁰⁹ South Africa also allows for the farming and harvesting of wildlife products to supply international demand for wildlife products, including rhino horn and lion/big cat skeletons and parts.¹¹⁰ While these species are protected by environmental legislation both locally and internationally, the transport, harvesting, slaughter, processing, and handling of the products from a health and zoonotic risk perspective is sometimes unsupervised, with unknown zoonotic risks that are downplayed in the interests of trade, regardless. There is a large grey area of illegal trade, handling, and processing.¹¹¹

The breeding of lions and other large predators for hunting, and/or slaughter for bones and parts is a particularly contentious, potentially high-risk activity from a zoonotic perspective.¹¹² A parallel can be drawn between the captive breeding of large cats in South Africa and the Asian tiger farms’ live trade, hunting, and interaction tourism. The captive lion industry and rhino farming are but two examples of a myriad of wildlife species farmed for profit in South Africa to satisfy local and export trade demand. Other

107. E. L. van Zyl, C. M. E. McCrindle, and D. Grace, “Participatory Risk Assessment for Food Safety in Informal Markets,” 54th International Congress of Meat Science and Technology, August 10–15, 2008, Cape Town, https://digicomst.ie/wp-content/uploads/2020/05/2008_02_25.pdf.

108. Andrew Taylor, Peter Lindsey, and Harriet Davies-Mostert, *An Assessment of the Economic, Social and Conservation Value of the Wildlife Ranching Industry and Its Potential to Support the Green Economy in South Africa* (Johannesburg: The Endangered Wildlife Trust, 2016).

109. Villiers, Charl de. “Game SA: Game Abattoirs and Meat Establishments of South Africa.” GAME SA, <https://www.gamesa.co.za/harvesting-process>.

110. Vivienne Williams et al., *Bones of Contention: An Assessment of the South African Trade in African Lion Panthera leo Bones and Other Body Parts* (Cambridge, UK: TRAFFIC, 2015), https://www.traffic.org/site/assets/files/2474/bones_of_contention_report.pdf.

111. Andrew Taylor, Peter Lindsey, and Harriet Davies-Mostert, *An Assessment of the Economic, Social and Conservation Value of the Wildlife Ranching Industry and Its Potential to Support the Green Economy in South Africa* (Johannesburg: The Endangered Wildlife Trust, 2016).

Jessica Bell Rizzolo, “Effects of Legalization and Wildlife Farming on Conservation,” *Global Ecology and Conservation* 25 (2021): e01390.

Blood Lions Official, “Predator Breeding & Keeping Industry – South Africa,” Conservation Action Trust, accessed September 28, 2023, <https://www.conservationaction.co.za/predator-breeding-keeping-industry-south-africa/>.

Adam Cruise, “Animal Farm: South Africa’s Blind Adherence to Neo-Colonial Wildlife Conservation,” *The Journal of African Elephants*, June 17, 2020, <https://africanelephantjournal.com/animal-farm-south-africas-blind-adherence-to-neo-colonial-wildlife-conservation/>.

112. Chris Alden and Ross Harvey, “South African Proposal to Breed Wildlife for Slaughter Courts Disaster,” *The Conversation*, June 14, 2020, <https://theconversation.com/south-african-proposal-to-breed-wildlife-for-slaughter-courts-disaster-140399>.

Stefano Betti, “Public Health and Organised Crime: Preventing Future Outbreaks,” RUSI, March 25, 2020, <https://shoc.rusi.org/blog/public-health-and-organised-crime-preventing-future-outbreaks/>.

species include exotic and indigenous large mammals, small mammals, birds, and reptiles, such as crocodiles and ostrich.¹¹³ The captive lion industry breeds lions (and other predators, including tigers) for trophy hunting, with bone and lion parts (claws, teeth, skulls etc) as either by-products of the hunt, or slaughtered (under 'euthanasia' permits) to harvest the skeleton and parts.

The husbandry, slaughter, processing, handling, and storage of the carcasses and product is currently unregulated. There are regulations in terms of hunting the lion, such as what permits are required and how long prior to the hunt the captive-bred lion must be released, which vary from province to province. The National Environment Management: Biodiversity Act and the Threatened or Protected Species regulations passed in terms of that act provide some guidance, but there are no official, gazetted regulations, guidelines, or controls on husbandry or on how the animals are kept and managed, slaughtered, or processed.¹¹⁴ Some of the provinces have camp size requirements. SAPA, the South African Predator Breeders Association, is an organization representing the lion and other predator breeders. Membership is voluntary. SAPA has compiled industry generated standards, but these cannot be enforced, are voluntary, and are not officially recognized.¹¹⁵ Theoretically, euthanasia requires that a veterinarian tranquilize the lion and then administer a kill shot or euthanasia drug. This is expensive and requires permits that are currently only issued in one province. Uncontrolled or illegal slaughter, where lions are confined and shot, often under inhumane conditions, has been recorded (and there are pending cruelty cases).¹¹⁶ A lion may be shot with a soft nose bullet in such a manner as not to damage the skull. The processing, storage, packaging, and transport of the lion skeletons and parts are also unregulated and uncontrolled. Lion carcasses are skinned, the organs and most of the meat removed, the skeleton salted and left to dry and then stored or packaged for export. Bones and offal are boiled down to produce a sticky substance that is then shaped into a bar (similar to a bar of soap) and exported as "lion cake" or "tiger cake" (essentially tiger/lion gelatin).¹¹⁷ The lack of regulation is highly controversial and has been part of various public processes, protests, and legal actions, including the NSPCA versus Minister of Environment Lion Bone Judgement and a Parliamentary Portfolio Committee Colloquium.¹¹⁸

The zoonotic risks associated with intensive agriculture, general farming practices, and venison production are known and relatively well-regulated through the relevant meat, health, and safety legislation.¹¹⁹ However, a report about intensive and selective breeding of game species for color variants

113. Pablo Sinovas et al., *Southern Africa's Wildlife Trade. An Analysis of CITES Trade in SADC Countries*, (Cambridge: United Nations Environment Programme, 2016).

114. Republic of South Africa, "No. 10 of 2004: National Environmental Management: Biodiversity Act, 2004," *Government Gazette*, June 7, 2004, 50–2, <https://www.sanbi.org/wp-content/uploads/2018/04/biodiversityact2004pdf.pdf>.
DEAT. (2007). Act 10 of 2004 National Environmental Management: Biodiversity Act, 2004: Threatened or Protected Species Regulations. Pretoria: *Government Gazette* Retrieved from https://www.environment.gov.za/sites/default/files/legislations/nemba_threatenedspecies_regulations_g29657rg8638gon152.pdf.

115. "SAPA Norms and Standards for Hunting Managed Ranch Lions in South Africa," SAPA, accessed September 28, 2023, <https://www.sapedators.co.za/images/photos/SAPANormsAndStandardsForHunting.pdf>.

116. Rachel Fobar, "Exclusive: Inside a Controversial South African Lion Farm," *National Geographic*, November 21, 2019, <https://www.nationalgeographic.com/animals/article/lion-farm-south-africa>.
"NSPCA Lays Animal Cruelty Charges Against North West Lion Farmer," *The Citizen*, May 6, 2019, <https://citizen.co.za/news/south-africa/crime/2126858/nspca-lays-animal-cruelty-charges-against-north-west-lion-farmer/>.

117. Kristin Nowell, *Far From A Cure: The Tiger Trade Revisited* (Cambridge: TRAFFIC International, 2000), https://www.changewildlifeconsumers.org/site/assets/files/1104/far_from_cure.pdf.

118. *National Council of the Society for the Prevention of Cruelty to Animals v. Minister of Environmental Affairs, Director-General of the Department of Environmental Affairs, and South African Predators Association*, Case No. 86515/2017, High Court of South Africa Gauteng Division, Pretoria, Republic of South Africa, <https://nspca.co.za/wp-content/uploads/2021/10/Lion-Bone-Judgment.pdf>.
Department of Forestry, Fisheries and the Environment, "ATC181108: Report on the Portfolio Committee on Environmental Affairs on the Colloquium on Captive Lion Breeding for Hunting in South Africa: Harming or Promoting the Conservation Image of the Country, Held on 21 and 22 August 2018, Dated 8 November 2018," *Parliamentary Monitoring Group*, accessed on September 29, 2023, <https://pmg.org.za/taled-committee-report/3595/>.

119. Jessica Bell Rizzolo, "Effects of Legalization and Wildlife Farming on Conservation," *Global Ecology and Conservation* 25 (2021): e01390.

and intensive venison production noted that natural selection for disease and parasite resistance will almost certainly be compromised by manipulated breeding, necessitating the use of compensatory stock remedies.¹²⁰ With evidence that growth supplements are already being used to increase body and horn size, and with the animals being less robust, a risk to human health exists unless appropriately managed and monitored.¹²¹ Resource constraints, capacity issues, and corruption in this industry may have contributed to a weakening of enforcement, controls, and standards.¹²² There are also concerns about the lack of control where meat is supplied to local communities in circumstances where animals are culled for population control reasons, or as Damage Causing Animals.

Recreational hunting for venison and biltong: The category of wildlife market refers to commercial and/or owner hunting for personal use, and the small-scale sale of venison and biltong to local butchers. It can include game meat shot/hunted for “the pot,” usually by reserve or lodge staff to supply meat for staff and visitor consumption and to supply surrounding communities. It is a short, localized value chain, and the risk of zoonoses is accordingly small.

Traditional formal African wildlife markets: The wide range, diversity, and extent of traditional markets and poor regulation make them hard to quantify. There are two very large, well established traditional markets, one in Johannesburg and one in Durban.¹²³ The Durban market is a complex of smaller, niche product outlets.¹²⁴ Both have a tourist section and a less public traditional section. They sell a wide variety of plant and animal products for traditional, cultural, and ‘tourist’ use. The source of products is diverse: legal harvesting, taxi hunts, illegal trade, and poaching. There were proposals for the formal hunting fraternity to supply by-products of the hunt not used by the hunters to meet this traditional market demand.¹²⁵ Live animals are sometimes kept, sold live, or slaughtered at these markets.¹²⁶

Muthi traditional medicine/traditional healer local markets: Traditional healers operate both in urban and rural areas and may use live wild animals and wildlife products in divination processes or as remedies. Retail locations include inside shops and private, informal practices in villages. There are also muthi shops in both rural and urban settlements. During Apartheid, traditional healers were classified as witchdoctors or witches.¹²⁷ Currently, witchcraft is associated with the darker side of traditional or spiritual

120. Jeanetta Selier et al., An Assessment of the Potential Risks of the Practice of Intensive and Selective Breeding of Game to Biodiversity and the Biodiversity Economy in South Africa (Pretoria: SANBI, 2018).

121. Jeanetta Selier et al., An Assessment of the Potential Risks of the Practice of Intensive and Selective Breeding of Game to Biodiversity and the Biodiversity Economy in South Africa (Pretoria: SANBI, 2018).

122. Johan L. Bekker, Louw C. Hoffman, and Piet J. Jooste, “Wildlife-associated Zoonotic Diseases in Some Southern African Countries in Relation to Game Meat Safety: A Review,” *The Onderstepoort Journal of Veterinary Research* 79, no. 1 (2012): E1–E12, <http://dx.doi.org/10.4102/ojvr.v79i1.422>.

123. W. J. P. Carr, “Mai Mai Market - ‘the Place of Healers,’” *The Heritage Portal*, October 16, 2015, <http://www.theheritageportal.co.za/article/mai-mai-market-place-healers>.

124. Amandla. “Traditional Medicine in Durban and Kwamuhle’s ‘Muthi Garden.’” Amandla, <https://amandladurban.org.za/tag/victoria-street-market/>.

125. Tony Carnie, “Animal Waste of Use to Muti Trade,” *Sunday Times: Business Times*, October 7, 2018, <https://www.businesslive.co.za/bt/business-and-economy/2018-10-06-animal--waste--of-use-to-muti-trade/?external>.

126. Susie Neilson, “Mai Mai Market Offers All Kinds of Muti,” *IOL*, April 24, 2014, <https://www.iol.co.za/news/south-africa/gauteng/mai-mai-market-offers-all-kinds-of-muti-1679922>.

W. J. P. Carr, “Mai Mai Market - ‘the Place of Healers,’” *The Heritage Portal*, October 16, 2015, <http://www.theheritageportal.co.za/article/mai-mai-market-place-healers>.

127. Theodore Petrus, “Defining Witchcraft-Related Crime in the Eastern Cape Province of South Africa,” *International Journal of Sociology and Anthropology* 3, no. 1 (2011): 1–8.

Theodore Stephen Petrus, *An Anthropological Study of Witchcraft-Related Crime in the Eastern Cape and Its Implications for Law Enforcement Policy and Practice*, PhD dissertation, Nelson Mandela Metropolitan University, 2009.

practices, utilizing bad spells and animal—and sometimes even human—parts.¹²⁸ African traditional medicine is used to counteract witchcraft.¹²⁹ Poachers use wildlife products as protective talismans. Rhino poachers have been arrested with pangolin scales, believed to protect against bullets. These products are sourced from traditional healers and witchdoctors.¹³⁰

Roadside traders: These outlets typically operate informally, sometimes without fixed premises. Roadside traders sell plant and animal products in rural and urban settings, which may include transport hubs such as taxi ranks and also includes local rural markets. Sources, supply chains, and customers for these traders are variable and not well mapped.

Bushmeat acquired for subsistence: There are two primary drivers of demand for bushmeat. In urban areas and higher income groups, bushmeat is seen as a delicacy, luxury item, and social status symbol.¹³¹ In rural areas that are in proximity to areas where wildlife exists, or that are close to reserves, bushmeat is seen as an inexpensive, readily available source of protein. Subsistence acquisition refers to the local opportunistic acquisition of animals (termed poaching when done illegally), usually by trapping or snaring for subsistence purposes. The supply of animals is very localized, and the poacher typically consumes the take themselves or offers the animal for sale in the local community.

Commercial Bushmeat Markets and Taxi-Hunting With Dogs: The informal but commercial uses of wildlife as food include poaching for sale and the illegal sourcing of wildlife meat through snaring, shooting, and dog- and taxi-hunting.¹³² Poached animal parts may be supplied to traditional medicine markets. Since these practices are almost entirely unregulated, they raise concerns of biodiversity sustainability.¹³³ Supply chains for animal products sourced this way can vary from short, local, and direct supply from poacher to market, to more extensive and longer chains involving other parties and long-distance transport.¹³⁴ In rural communities, poached bushmeat is sold at local markets (essentially an undeveloped communal area), or at roadside traders. Subsistence poaching is usually to supply family and immediate neighbours on a barter system. In many rural communities, Chinese traders have set up trading posts or shops and may act as a market for this product as well.

The use of dogs for hunting wildlife as a source of food is a long-standing traditional practice in South Africa and was once primarily for subsistence. With increasing urbanization, private game

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128. Mary Braid, "Africa: Witchcraft Returns to Haunt New South Africa," *Independent*, January 21, 2008, <https://www.independent.co.uk/news/africa-witchcraft-returns-to-haunt-new-south-africa-1139937.html>.
Rudolf Nkgadima, "WATCH: 'Witchcraft' Is Fuelling Human Trafficking, Says NGO," *IOL*, November 30, 2020, <https://www.iol.co.za/multimedia/videos/watch-witchcraft-is-fuelling-human-trafficking-says-ngo-5bf553fc-bfc1-4ad7-ba20-23411715f8fa>.
129. B. L. Meel, "Witchcraft in Transkei Region of South African: Case Report," *African Health Sciences* 9, no. 1 (2009): 61–4.
Yaseen Ally, "Burn the Witch: The Impact of the Fear of Witchcraft on Social Cohesion in South Africa," *Psychology in Society* 49 (2015): 25–45.
130. Smith, Mic. "Rhino Poachers Use Black Magic." *The Saigon Times* (2015). Published electronically Monday, Jun 1, 2015, 23:18. <https://english.thesaigontimes.vn/41158/Rhino-poachers-use-black-magic.html>.
Sangomas are selected and trained and recognized as part of Zulu T&CM. The term 'witchdoctor' is a European term but in SA, witches and witchcraft are a mix of T&CM and associated with practices that use body parts, etc.
131. Alexandre M. Chausson, et al., "Understanding the Sociocultural Drivers of Urban Bushmeat Consumption for Behavior Change Interventions in Pointe Noire, Republic of Congo," *Human Ecology* 47 (2019): 179–91, <https://doi.org/10.1007/s10745-019-0061-z>.
132. See Annexure 1 Figure 4 for a schematic representation of taxi hunting elements.
133. Peter Andrew Lindsey et al., "The Bushmeat Trade in African Savannas: Impacts, Drivers, and Possible Solutions," *Biological Conservation* 160 (2013): 80–96.
134. V. Martins and C. M. Shackleton, "Bushmeat Use Is Widespread but Under-Researched in Rural Communities of South Africa," *Global Ecology and Conservation* 17 (2019): e00583.

ownership, and conservation legislation, plus a growth in the microbus taxi industry, hunting with dogs changed to become more commercialized and is now associated with betting activities and revenue streams.¹³⁵ The meat and other products harvested are utilized by local communities or moved to other informal markets as bushmeat and as a source of product for traditional medicine. In some instances, the dogs kill the animal and in other instances, the hunters will move in with spears or guns and kill the animal. The quality, condition and breed of dogs used varies between regions, owners and purpose, with some of the taxi owners having high value, specifically-bred animals, while the less commercial hunting will use less valuable mixed-breed dogs. In semi-urban areas, it is becoming increasingly popular for teenagers to hunt with dogs in open areas. This usually involves smaller wildlife species (hare, mongoose, ground nesting birds, small antelope).¹³⁶

Some of the taxi hunters are linked to poaching syndicates and other criminal activities.¹³⁷ A number of taxi owners will load their dogs up and meet at an arranged point on the boundary of a reserve. The dogs are then released, and bets are taken on the fastest or biggest kill.¹³⁸ The taxi hunts have also been linked to higher value game poaching operations; e.g., in Kwazulu-Natal, taxi hunts would be arranged shortly before a planned rhino poaching operation on a reserve. The dogs are released and anti-poaching units (APU) respond. While the APU are occupied, poachers move in for higher value game.¹³⁹ The dog hunting causes considerable losses in game and damage to fences for wildlife farm and reserve owners.

There is a wide variety of markets and distribution chains, which accords with the extreme diversity of South Africa's socioeconomic tiers and regional types, such as first-world cities, shanty towns, and rural traditional communities. For example, taxis (mini-buses) constitute the major form of transport in the country across the spectrum, from very rural areas to high-density cities and informal settlements. The taxi industry has diversified and maximized opportunities, transporting both people and products, including meat and animal products for traditional medicines and markets. Some taxi/minibus owners live in rural areas, hunt with dogs (a combination of betting and traditional dog hunts), and harvest a wide variety of species such as small hare, antelope, birds, warthog, bushpig, etc. The product is transported along the taxi routes to urban and semi-urban areas. The meat and product may then be sold at taxi-ranks and/or informal roadside markets, or in formal traditional markets. Taxi owners will also buy up meat that has been poached from local rural communities and act as the conduit or market.¹⁴⁰ The carcasses, or parts thereof, may be sold straight from the taxi at a taxi-rank to commuters, or to roadside traders and informal butcheries or traditional medicine dealers.

135. Elizabeth Pierson, "South Africans are Using Dogs to Hunt, Even Though it is Illegal," Mashable, July 19, 2015, <https://mashable.com/archive/south-africans-dogs-hunting>.

Jaime Chambers, "What Drives Illegal Hunting with Dogs? Traditional Practice in Contemporary South Africa," *Ethnobiology Letters* 11, no. 1 (2020): 25–8, <https://doi.org/10.14237/ebl.11.1.2020.1645>.

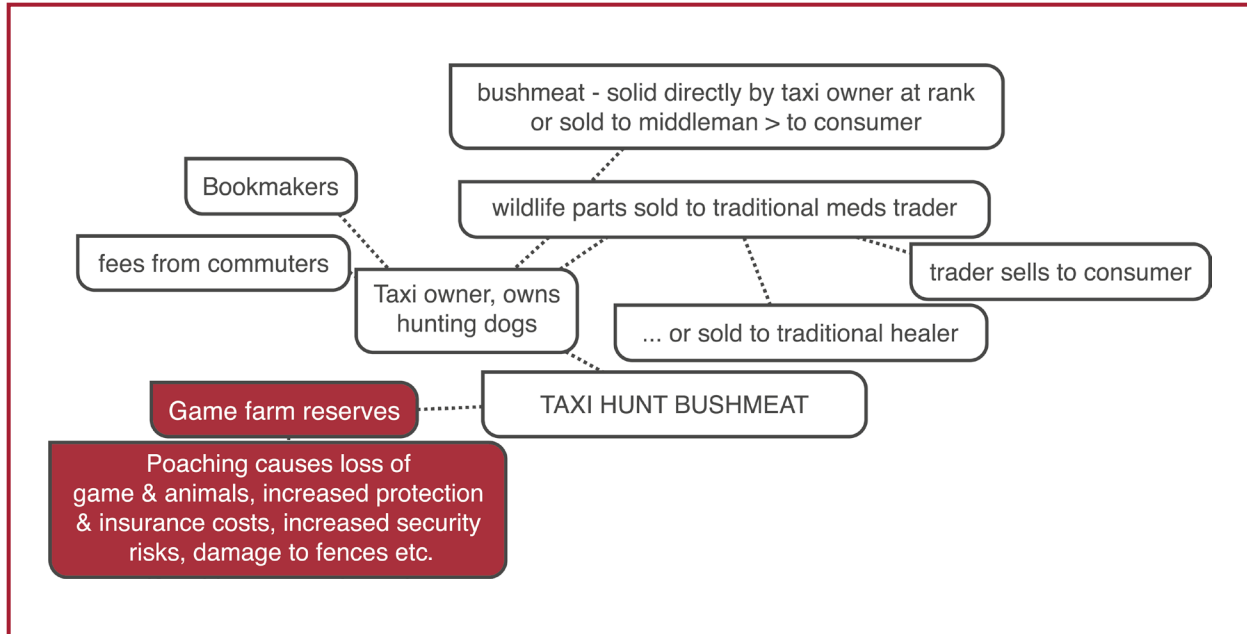
136. Jaime Chambers, "What Drives Illegal Hunting with Dogs? Traditional Practice in Contemporary South Africa," *Ethnobiology Letters* 11, no. 1 (2020): 25–8, <https://doi.org/10.14237/ebl.11.1.2020.1645>.

137. Penny Fourie, "Illegal Dog Hunting and Betting Syndicates Intimidate North Coast Farmers," *The North Coast Courier*, July 29, 2020, <https://northcoastcourier.co.za/156252/illegal-dog-hunting-and-betting-syndicates-intimidate-north-coast-farmers/>.

138. Dave Chambers, "Gambling-Fueled Taxi Hunts Run By Rich and Powerful Are Wiping Out SA's Most Endangered Bokkie," June 26, 2021, <https://www.timeslive.co.za/news/south-africa/2021-06-26-gambling-fuelled-taxi-hunts-run-by-rich-and-powerful-are-wiping-out-sas-most-endangered-bokkie/>

139. Jaime Chambers, "What Drives Illegal Hunting with Dogs? Traditional Practice in Contemporary South Africa," *Ethnobiology Letters* 11, no. 1 (2020): 25–8, <https://doi.org/10.14237/ebl.11.1.2020.1645>.

140. Jaime Chambers, "What Drives Illegal Hunting with Dogs? Traditional Practice in Contemporary South Africa," *Ethnobiology Letters* 11, no. 1 (2020): 25–8, <https://doi.org/10.14237/ebl.11.1.2020.1645>.



Commercial poaching of high value wildlife and illegal international trade in animals and body parts: South Africa suffers from persistent and pervasive commercial poaching of lions, pangolins, elephants, and rhinos. Much of the poaching supplies Asian market demand.¹⁴¹ Poachers often have sophisticated supply chains, sometimes overlapping with other criminal activities.¹⁴² Animals are poached from sanctuaries, ranches, farms, and the wild.

Companion Animal Markets

Breeding and trade of dogs, cats, and other companion animals through pet shops and online is widespread. There are some commercial breeders. In larger cities, welfare organizations work closely with law enforcement and community health services to counter the proliferation of “puppy mills.”¹⁴³ Companion animals (mainly dogs) are also sold roadside and by informal traders. South Africa has a large exotic pet breeding and trade supplying local and international markets, including a large bird and reptile trade associated with high zoonotic risk.¹⁴⁴ The consumption of domestic dogs and cats is not traditionally practiced and the extent of any such practices is unknown, but there are some recorded incidents of dog meat use. Animals Protection Act 71 of 1962 prohibits breeding dogs for slaughter and consumption.¹⁴⁵

141. Trang Nguyen, “The Impact of Traditional Asian Medicine on African Wildlife: The Role of East Asian Immigrants,” PhD thesis, University of Kent, 2019.

142. “Organized Crime & Criminal Syndicates,” Poaching Facts, accessed September 29, 2023, <http://www.poachingfacts.com/faces-of-the-poachers/organized-crime-criminal-syndicates/>.

143. Mariclaire Smit, “Puppy Mills – the Hidden Horror,” Northglenn News, May 28, 2016, <https://northglennnews.co.za/83517/puppy-mills-the-hidden-horror/>.

144. Bruno B. Chomel, Albino Belotto, and François-Xavier Meslin, “Wildlife, Exotic Pets, and Emerging Zoonoses,” *Emerging Infectious Diseases* 13, no. 1 (2007): 6–11.

145. Republic of South Africa, “The Animals Protection Act 71 of 1962,” *Government Gazette Extraordinary*, June 22, 1962, 7–13, https://www.gov.za/sites/default/files/gcis_document/201505/act-71-1962.pdf.

REGULATORY ENVIRONMENT

Legal Framework

The Constitution is the main law under which all other regulations and legislative frameworks operate.¹⁴⁶ Section 2 states: “This Constitution is the supreme law of the Republic; law or conduct inconsistent with it is invalid, and the obligations imposed by it must be fulfilled.”

South Africa has concurrent national and provincial powers of regulation, administration, and enforcement in the contexts of environment, agriculture, and health.¹⁴⁷ Some elements of regulatory, enforcement, and service provision are assigned to local authorities (municipalities, tribal, and traditional authorities).¹⁴⁸ The national Department of Agriculture, Land Reform and Rural Development (DALRRD) bears responsibility for food safety and security, the management of animal diseases, as well as animal protection and welfare.¹⁴⁹ Primary health care falls under the Department of Health (DOH), which is responsible for the “improvement of the prevention of illness, disease and the promotion of healthy lifestyles, and to consistently improve the health care delivery system by focusing on access, equity, efficiency, quality and sustainability.”¹⁵⁰

Wildlife and environmental issues are managed at the national level by the Department of Forestry, Fisheries and the Environment (DFFE). The principal environmental statutes are the National Environmental Management Act 107 of 1998 (NEMA) and the National Environmental Management: Biodiversity Act 10 of 2014 (NEMBA).¹⁵¹ The Threatened or Protected Species Regulations and various promulgated Norms and Standards provide species specific regulatory frameworks.¹⁵² There is no national policy on sustainable use of biodiversity, although sustainable use is recognized in the environmental rights enshrined in the Constitution and governed under NEMBA and its associated regulations.¹⁵³

General utilization and conservation of wildlife is also concurrently administered by provincial legislation. South Africa has nine provinces, each with their own legislation and ordinances. Regulatory requirements, enforcement, and implementation vary considerably from province to province and some provinces do not implement national regulations. The national environmental legislation is considered good, generally.¹⁵⁴ However, the fragmentation of environmental and wildlife legislation between the national government and the nine provinces, the concurrent national/provincial mandates, the lack of centralized permitting, recording, and administration of wildlife issues and wildlife trade and utilization all

146. The Constitution of the Republic of South Africa 108 of 1996 (RSA, 1996).

147. The Constitution of the Republic of South Africa 108 of 1996, Chapter 2 (RSA, 1996).

148. Warren Beech and Nicholas Veltman, “Environmental Law and Practice in South Africa: Overview,” Thomson Reuters Practical Law, accessed September 29, 2023, [https://uk.practicallaw.thomsonreuters.com/4-502-7865?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://uk.practicallaw.thomsonreuters.com/4-502-7865?transitionType=Default&contextData=(sc.Default)&firstPage=true).

149. “Department of Agriculture, Land Reform and Rural Development (DALRRD),” National Government of South Africa, accessed September 29, 2023, <https://nationalgovernment.co.za/units/view/427/department-of-agriculture-land-reform-and-rural-development-dalrrd>.

150. Reuben Govender, D. Naidoo, and Elna Buys, “Managing Meat Safety at South African Abattoirs,” *International Journal of Biological, Veterinary, Agricultural and Food Engineering* 7 (2013): 124–9.

151. Republic of South Africa, “National Environmental Management Act No. 107 of 1998,” Cape Town: Government Gazette, 1999. Republic of South Africa, “No. 10 of 2014: National Environmental Management: Biodiversity Act, 2014,” *Government Gazette*, June 7, 2014, 50–2, <https://www.sanbi.org/wp-content/uploads/2018/04/biodiversityact2014.pdf>.

152. DEAT. “Act 10 of 2014 National Environmental Management: Biodiversity Act, 2014: Threatened or Protected Species Regulations.” edited by the Department of Environmental Affairs and Tourism. Pretoria: Government Gazette, 2014.

153. The Constitution of the Republic of South Africa 108 of 1996, Section 24 (RSA, 1996).

154. “Pollution & Climate Change: Overview,” Centre for Environmental Rights, accessed September 29, 2023, <https://cer.org.za/programmes/pollution-climate-change>.

result in poor enforcement and extensive illegal activities.¹⁵⁵ One of the major shortcomings in the South African legislative and regulatory framework is the unresolved and ongoing conflict of mandate for the regulation of captive, semi-captive, and managed wildlife. This frequently results not only in conflicting legislation, but also inadequate to absent controls, monitoring, and regulation of activities and practices. Major shortcomings caused by these conflicting mandates include the husbandry and welfare of captive, semi-captive, and managed wildlife.¹⁵⁶

The breeding of wildlife for body parts by the wildlife industry is partially regulated by environmental and agricultural legislation (national and provincial). However, legislation and the regulatory framework have not kept up with the exponential growth of the wildlife industry. The increasing intensification and industrialization of wildlife production exposes major gaps in regulatory frameworks: national policy allows the intensive captive breeding of lions for hunting, tourism, and parts, but does not regulate the conditions under which the animals are bred, slaughtered, and processed, all with largely undocumented and unacknowledged zoonotic risks.¹⁵⁷ There are industry-driven efforts for self-regulation and for a reduction in controls including regulation by environmental legislation for privately owned wildlife to be considered agricultural/production animals. Some of the regulatory gaps have been challenged legally.¹⁵⁸ There are current efforts to develop regulation and species-specific norms and standards, but these are hampered by unresolved mandates, lack of capacity, and political will.

With the growth of the wildlife industry, there has been a growing movement putting increasing pressure on government and international trade organizations to reclassify and regulate farmed, ranched, privately owned, and managed wildlife species as agricultural/production animals.¹⁵⁹ There is strong opposition to the recent listing of a number of wild species under the agricultural Meat Safety Act (MSA) and Animals Improvement Act (AIA). This designation allows for intensive farming, selective breeding and breed modification, and harvesting for commercial consumption.¹⁶⁰ South Africa has large and well-established ostrich and crocodile farming industries already as a result of both species having been reclassified as agricultural species and regulated by agricultural legislation.¹⁶¹

155. Endangered Wildlife Trust, The Lewis Foundation, and Centre for Environmental Rights, *Fair Game? Improving the Well-Being of South African Wildlife: Review of the Legal and Practical Regulation of the Welfare of Wild Animals in South Africa*, 2018 (Johannesburg: CER, EWT and Lewis Foundation, 2018).

156. Endangered Wildlife Trust, The Lewis Foundation, and Centre for Environmental Rights, *Fair Game? Improving the Well-Being of South African Wildlife: Review of the Legal and Practical Regulation of the Welfare of Wild Animals in South Africa*, 2018 (Johannesburg: CER, EWT and Lewis Foundation, 2018); see as well: Chris Alden and Ross Harvey, "South African Proposal to Breed Wildlife for Slaughter Courts Disaster," *The Conversation*, June 14, 2020, <https://theconversation.com/south-african-proposal-to-breed-wildlife-for-slaughter-courts-disaster-140399>.

157. Johan L. Bekker, Louw C. Hoffman, and Piet J. Jooste, "Wildlife-associated Zoonotic Diseases in Some Southern African Countries in Relation to Game Meat Safety: A Review," *The Onderstepoort Journal of Veterinary Research* 79, no. 1 (2012): E1–E12, <http://dx.doi.org/10.4102/ojvr.v79i1.422>. Steven Broad, "Wildlife Trade, COVID-19 and Zoonotic Risks: Shaping the Response," *TRAFFIC Briefing Paper*, 2020.

158. "S.A. Game Ranchers Accept Responsibility for Self-Regulation of Wildlife Species," *Lowvelder*, October 30, 2019, <https://lowvelder.co.za/510622/sa-game-ranchers-accept-responsibility-self-regulation-wildlife-species/>.

159. Nicholas Ashby, "Alarm Over Proposed Changes to Meat Safety Act," *GroundUp*, May 15, 2020, <https://www.groundup.org.za/article/alarm-over-proposed-changes-meat-safety-act-despite-warnings/>.

160. See the following: Republic of South Africa, "Meat Safety Act 40 of 2000," *Government Gazette*, November 1, 2000, https://www.gov.za/sites/default/files/gcis_document/201409/a40-000.pdf.

Department of Agriculture, Forestry and Fisheries, "Government Notice: Publication for Information and for Public Comments," *Government Gazette*, February 28, 2020, <https://cer.org.za/wp-content/uploads/2020/04/Proposed-Amendment-to-Meat-Safety-Act-Comment-due-by-28-April-2020.pdf>

Republic of South Africa, "Animal Improvement Act 62 of 1998," *Government Gazette*, September 28, 1998, https://www.gov.za/sites/default/files/gcis_document/201409/a62-98.pdf.

Adam Cruise, "Animal Farm: South Africa's Blind Adherence to Neo-Colonial Wildlife Conservation," *The Journal of African Elephants*, June 17, 2020, <https://africanelephantjournal.com/animal-farm-south-africas-blind-adherence-to-neo-colonial-wildlife-conservation/>.

Chris Alden and Ross Harvey, "South African Proposal to Breed Wildlife for Slaughter Courts Disaster," *The Conversation*, June 14, 2020, <https://theconversation.com/south-african-proposal-to-breed-wildlife-for-slaughter-courts-disaster-140399>.

161. Warren Beech and Nicholas Veltman, "Environmental Law and Practice in South Africa: Overview," *Thomson Reuters Practical Law*, accessed September 29, 2023, [https://uk.practicallaw.thomsonreuters.com/4-502-7865?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://uk.practicallaw.thomsonreuters.com/4-502-7865?transitionType=Default&contextData=(sc.Default)&firstPage=true).

To modify these listings, the Minister of Agriculture must propose amendments, and they may or may not publish these for public comment in the Government Gazette. Amendments would need to go through various parliamentary and legal processes. This list is difficult to change and the process is long. The new expanded list of species has not yet been published in the Government Gazette, and is therefore not yet effective in law. The Meat Safety Act and Animal Improvement Act schedule amendments were proposed and passed by the Department of Agriculture, Land Reform and Rural Development. Press surrounding these amendments suggest they were in response to pressure from the wildlife/game ranching industry to further commercialize wildlife, maximize utilization, and reduce controls under environmental legislation. The Department of Forestry, Fisheries and the Environment, as the state department ultimately tasked with wildlife conservation, seems not to have been consulted.

The trade and utilization policies and regulations of rhinos, elephants, lions, and leopards are currently being reviewed by the Minister of Environment, Forestry and Fisheries' appointed High Level Advisory Panel (HLP). The HLP was appointed following local and global opposition to the captive breeding of lions for petting, trophy hunting, and export of skeletons, as well as the lack of regulations and the risks posed to South Africa's reputation, biodiversity, and wild lion and other big cat populations.¹⁶²

The regulation of the breeding and trade in exotic species is largely unregulated for practices within South Africa.¹⁶³ This may also vary from province to province. (There are nine provinces, each with their own wildlife conservation ordinances or statutes.) Largely, the keeping and breeding of exotic species is unregulated. Species that may pose a threat to indigenous species may be regulated, nationally or provincially, e.g., ferrets.¹⁶⁴ With regard to the exotic pet trade, some mammals favoured as pets have become invasive through various pet trade releases and escapees.¹⁶⁵ South Africa is one of the largest breeders and exporters of exotic bird species, including African grey parrots.¹⁶⁶ Species that are CITES listed are regulated in terms of the Convention and CITES permits. However, this would only apply to international trade, e.g., African Grey parrots are listed as CITES App 1.¹⁶⁷ Trade in wild-caught African grey parrots is banned, but captive-bred parrots, bred in a Captive Breeding Operation registered by CITES with relevant permits and documentation, is allowed.

The interaction between domestic law and CITES is species-dependent, according to CITES listing and domestic regulatory requirements. For example, lions are indigenous to South Africa and listed under TOPS in terms of NEMBA, and thus their keeping, breeding, trading, and hunting domestically are

162. Department of Forestry, Fisheries and the Environment, "ATC181108: Report on the Portfolio Committee on Environmental Affairs on the Colloquium on Captive Lion Breeding for Hunting in South Africa: Harming or Promoting the Conservation Image of the Country, Held on 21 and 22 August 2018, Dated 8 November 2018," Parliamentary Monitoring Group, accessed on September 29, 2023, <https://pmg.org.za/taled-committee-report/3595/>.

163. Robyn Angela Lowe, An Overview of the Exotic Pet Trade in the Gauteng Province, Master's Dissertation, University of Johannesburg, 2018, <https://ujcontent.uj.ac.za/esploro/outputs/graduate/An-overview-of-the-exotic-pet/9912789307691#file-0>.

164. Ruth Gitonga, "List of Illegal Pets in South Africa and Where to Get Wildlife Permits," Briefly, updated September 1, 2023, <https://briefly.co.za/34280-list-illegal-pets-south-africa.html#:~:text=According%20to%20the%20National%20Environmental%20Management%20Biodiversity%20Act5,specific%20requirements%20and%20obtain%20various%20permits%20before%20purchase>.

165. Ndivhuwo Shivambu Tinyiko C. Shivambu, and Colleen T. Downs, "Non-native Small Mammal Species in the South African Pet Trade," *Management of Biological Invasions* 12, no. 2 (2021): 294–312, <https://doi.org/10.3391/mbi.2021.12.2.06>.

166. Sheree Bega, "Parrot Breeder Faces Criminal Charges for 'Horrendous' Conditions at Randburg Facility," IOL, March 7, 2020, <https://www.iol.co.za/saturday-star/news/parrot-breeder-faces-criminal-charges-for-and-quot-horrendous-and-quot-conditions-at-randburg-facility-44291374>. "South Africa: Register of Captive-Breeding Operations," CITES, accessed September 29, 2023, <https://cites.org/eng/common/reg/cb/ZA>.

167. BirdLife International, "CITES round-up: the world speaks up for African Grey," Ornithology Exchange, October 5, 2016, <https://ornithologyexchange.org/forums/topic/30294-cites-round-up-the-world-speaks-up-for-the-african-grey/>.

regulated by this legislation and relevant permits are required. CITES legislation would only apply when exporting a live animal, parts, or derivatives. In order for a CITES export permit from South Africa to be issued, demonstrated adherence to domestic legislation is required. In contrast, tigers are considered exotic species in South Africa, and the keeping, breeding, and local trade of tigers is not well regulated domestically.¹⁶⁸ There are tigers kept in backyards in urban suburbs in Johannesburg, South Africa, for example. CITES legislation only applies to the export of tiger parts or live animals.

There is a national animal disease surveillance system established by the DALRRD, the Animal Disease Control Act. It is administered through the district veterinarian network, and it dictates a permitting system to control the movement of animals. Monitoring at formal points in the domestic animal value chain is strong, but less robust in the context of wildlife. The monitoring of wildlife trade falls to the South African National Biodiversity Institute, functioning as the delegated South Africa Scientific Authority under the National Environmental Management: Biodiversity Act, but capacity is inadequate and thus there is no routine monitoring of the formal or informal wildlife trade.¹⁶⁹ Monitoring outside of the formal chains is much weaker, with little or no monitoring at informal markets.

The enforcement of wildlife laws falls under the Environmental Management Inspectorate, but inspectors are not empowered to deal with animal disease issues, housing, or husbandry practices. These are the responsibility of district veterinarians reporting to DALRRD, constituting another conflicting mandate issue impacting enforcement.

South Africa has legislation that regulates health care professions and medicines. An interim Traditional Practitioners Council was established in 2013. The Traditional Health Practitioners (THP) Act 22 of 2007, introduced in 2014, aims “to establish the Interim Traditional Health Practitioners Council of South Africa”; “to provide for a regulatory framework to ensure the efficacy, safety, and quality of traditional health care services”; “to provide for the management and control over the registration, training and conduct of practitioners, students, and specified categories in the traditional health practitioner’s profession”; and “to provide for matters connected therewith.”¹⁷⁰ This Act was introduced to provide legitimization of traditional and indigenous practitioners and traditional medicinal products. The regulation of traditional healers and medicines has proved challenging.¹⁷¹ Traditional medicine is only regulated by the Medicines and Related Substances Act 101 of 1965, which is problematic because it does not necessarily give adequate powers and recognition to traditional medicine.¹⁷²

168. Don Pinnock, “Tigers Being Bred in Gauteng Backyards for Petting and Bone Export,” *Daily Maverick*, April 23, 2018, <https://www.dailymaverick.co.za/article/2018-04-23-tigers-being-bred-in-gauteng-backyards-for-petting-and-bone-export/>.

169. Republic of South Africa, “No. 10 of 2004: National Environmental Management: Biodiversity Act, 2004,” *Government Gazette*, June 7, 2004, 50–2, <https://www.sanbi.org/wp-content/uploads/2018/04/biodiversityact2004pdf.pdf>.

170. Republic of South Africa, “Act No. 22 of 2007: Traditional Health Practitioners Act, 2007,” *Government Gazette*, January 10, 2008, <https://www.gov.za/documents/traditional-health-practitioners-act>.

171. GI-TOC (Global Initiative Against Transnational Organized Crime), “Crime and Contagion: The Impact of a Pandemic on Organized Crime” (Geneva: Global Initiative Against Transnational Organized Crime, 2020), <https://globalinitiative.net/wp-content/uploads/2020/03/GI-TOC-Crime-and-Contagion-The-impact-of-a-pandemic-on-organized-crime-1.pdf>.

Renee Street and Christa Rautenbach, “SA Wants to Regulate Traditional Healers—But It’s Not Easy,” *Sowetan Live*, January 25, 2016, <https://www.sowetanlive.co.za/news/2016-01-25-sa-wants-to-regulate-traditional-healers-but-its-not-easy/>.

Renee Anne Street, “Unpacking the New Proposed Regulations for South African Traditional Health Practitioners,” *The South African Medical Journal* 106, no. 4 (2016): 22–3.

Andrew Taylor, Peter Lindsey, and Harriet Davies-Mostert, *An Assessment of the Economic, Social and Conservation Value of the Wildlife Ranching Industry and Its Potential to Support the Green Economy in South Africa* (Johannesburg: The Endangered Wildlife Trust, 2016).

172. Amber Louise Abrams et al., “Legislative Landscape for Traditional Health Practitioners in Southern African Development Community Countries: A Scoping Review,” *BMJ Open* 10, no. 1 (2020): e029958.

Enforcement and Compliance

The formal agricultural and wildlife industry operates largely within the recognized legal framework.¹⁷³ The wildlife industry is organized, generally acts collectively, and engages with government, enforcement, and conservation professionals. Various organizations have sought legal reform through “contested illegality” practices centered around trade in wildlife products, and they have pursued legal challenges to restrictions on rhino horn trade (currently, domestic trade is legal and international trade restricted through CITES).¹⁷⁴

There has been an increased focus on improving the regulatory enforcement, prosecution, sentencing, and national and international co-operation on high value, high profile, endangered wildlife and wildlife product (including rhino horn, pangolin, and ivory) crime. However, corruption, a pervasive lack of resources and institutional capacity, and an apparent lack of political will, have weakened the effectiveness of these efforts.¹⁷⁵ Interventions to protect wildlife are hampered by corruption and by ongoing organized criminal activity associated with the operation of animal markets and with the trade in animals and animal products on all levels, from national to local government.¹⁷⁶ In the contexts of poaching and illegal trade, South Africa has persistent problems with the active involvement of law enforcement, anti-poaching personnel and rangers, the wildlife industry, conservation authorities, and wildlife veterinarians in illegal activities.¹⁷⁷ The practice of contested illegality, where the wildlife industry has operationally and legally challenged the regulation and legislation of local and international restrictions on trade in wildlife parts and derivatives, is well documented.¹⁷⁸ Wildlife and environmental crime and animal welfare are still seen as low priority by the judiciary, with leniency toward activities that are considered poverty- or subsistence-driven such as meat poaching or that are considered cultural/traditional, such as hunting with dogs, bushmeat, sourcing leopard skins for traditional dress, etc.¹⁷⁹ Regulatory enforcement on lower value/lower profile and more common species is generally poor, not only regarding field enforcement but also in terms of low prosecution rates, sentencing, and fines. The judiciary tends to be more lenient towards accused persons in cases where traditional use of wildlife and subsistence are factors.¹⁸⁰

There are contradictory and opposing views on the pros and cons of legalized trade in wildlife parts and derivatives within the conservation community. There are several conservation and

173. Warren Beech and Nicholas Veltman, “Environmental Law and Practice in South Africa: Overview,” Thomson Reuters Practical Law, accessed September 29, 2023, [https://uk.practicallaw.thomsonreuters.com/4-502-7865?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://uk.practicallaw.thomsonreuters.com/4-502-7865?transitionType=Default&contextData=(sc.Default)&firstPage=true).

174. Annette Michaela Hübschle, *A Game of Horns: Transnational Flows of Rhino Horn* (Cologne: IMPRS-SPCE, 2016). See, for example, *Kruger and Another v Minister of Water And Environmental Affairs and Others* (57221/12) [2015] ZAGPPHC 1018; [2016] 1 All SA 565 (GP) (28 November 2015), <https://www.saflii.org/za/cases/ZAGPPHC/2015/1018.pdf>.

175. DEA, “Interventions to Address Illegal Killing of Rhinos,” edited by Department of Environmental Affairs. Cape Town: Department of Environmental Affairs, 2018.

176. Mandy De Waal, “The Great Meat Fraud, SA Edition,” *Daily Maverick*, February 27, 2013, <https://www.dailymaverick.co.za/article/2013-02-27-the-great-meat-fraud-sa-edition/>.

177. Annette Michaela Hübschle, *A Game of Horns: Transnational Flows of Rhino Horn* (Cologne: IMPRS-SPCE, 2016). “Enforcement Agencies (SIU, Hawks and NPA) on COVID-19 Corruption Cases,” Parliamentary Monitoring Group, October 20, 2020, <https://pmg.org.za/committee-meeting/31236/>.

178. Annette Michaela Hübschle, *A Game of Horns: Transnational Flows of Rhino Horn* (Cologne: IMPRS-SPCE, 2016). GI-TOC (Global Initiative Against Transnational Organized Crime), “Crime and Contagion: The Impact of a Pandemic on Organized Crime” (Geneva: Global Initiative Against Transnational Organized Crime, 2020), <https://globalinitiative.net/wp-content/uploads/2020/03/GI-TOC-Crime-and-Contagion-The-impact-of-a-pandemic-on-organized-crime-1.pdf>.

179. Megan Griffiths, “Heritage Lost: The Cultural Impact of Wildlife Crime in South Africa,” *SA Crime Quarterly* No. 60 (2017): 45–50.

180. Melanie Wellsmith, “Wildlife Crime: The Problems of Enforcement.” *European Journal on Criminal Policy and Research* 17, no. 2 (2011): 125–48.

environmental groups supporting community projects with traditional and cultural components, e.g., growing and sustainable harvesting of medicinal fauna.¹⁸¹ Wildlife protection and welfare groups are concerned about and oppose some of the activities and markets that have poor welfare practices and may be cruel and/or considered inhumane and unsustainable.¹⁸² Animal rights groups oppose the use of both domestic and wild animals for consumptive purposes. There is growing opposition from some cultural and traditional leaders and opposition political parties to the intensification and commodification of wildlife, especially of species that have cultural value and significance.¹⁸³

The informal trade and many of the local animal markets operate largely outside the law. There are inadequate resources and capacity to oversee the operation of these markets, and thus ineffectual enforcement results in a widespread lack of compliance with the various wildlife and health regulations. This applies to both wildlife and domestic livestock markets. Furthermore, even in the case where environmental and conservation legislation may prohibit or regulate certain uses of wildlife and wildlife parts, but such use is pursued for traditional or cultural purposes, political sensitivities have resulted in legislation not being enforced.¹⁸⁴ There is broad support at public, government, and community levels for traditional and local community markets and practices, supported by facilitating legislation and structures.¹⁸⁵

Traditional healing and cultural practices were opposed and even criminalized over extended periods by both European colonizers and later by the apartheid government.¹⁸⁶ Since the advent of a constitutional democracy in South Africa, there has been a strong commitment and moves by the African National Congress government to recognize and formalize traditional and cultural practices. Various statutes, government structures, and organizations were established to this end, and actions were taken to incorporate traditional healing and cultural practices into mainstream health and medical systems. The blending, crossover, and diversity of markets and supply chains that includes legal, illegal, and illicit components, and the size and extent of traditional medicine and cultural uses, make it difficult to regulate. Coupled with this, there is inadequate enforcement, with implications for other areas of policy and regulation, e.g., the Medical Schemes Act, 131 of 1998, the Basic Conditions of Employment Act, 75 of 1997, the National Health Act, 61 of 2003, the National Environmental Management: Biodiversity Act, 10 of 2004, and the Patents Amendment Act, 58 of 2005. Traditional healers, medicines, and cultural matters fall under the Minister of Co-operative Governance and respective provincial health departments

181. Kate Whittington and Jonathan Trinastic, "Legalising Trade in Endangered Species Products - Morally Bankrupt or a Conservation Aid?" Scitable by Nature Education, October 25, 2013, https://www.nature.com/scitable/blog/eyes-on-environment/legalising_trade_in_endangered_species/. Biores, "Navigating the Wildlife Trade Debate," Global Initiative Against Transnational Organized Crime, March 28, 2014, <https://globalinitiative.net/analysis/navigating-the-wildlife-trade-debate/>.

182. Michele Pickover, "A Looming Crisis – the Captive Big Cat Industry, COVID-19 and Government Culpability," EMS Foundation, accessed September 30, 2023, https://emsfoundation.org.za/a-looming-crisis-the-captive-big-cat-industry-covid_19-and-government-culpability/.

183. D. N. Qekwana et al., "Animal Welfare in Africa: Strength of Cultural Traditions, Challenges and Perspectives," in Sophie Hild and Louis Schweitzer (Eds.), *Animal Welfare: From Science to Law* (Paris: La Fondation Droit Animal, Éthique et Sciences, 2019), 103–7.

184. D. N. Qekwana et al., "Animal Welfare in Africa: Strength of Cultural Traditions, Challenges and Perspectives," in Sophie Hild and Louis Schweitzer (Eds.), *Animal Welfare: From Science to Law* (Paris: La Fondation Droit Animal, Éthique et Sciences, 2019), 103–7.

See also: Amber Louise Abrams et al., "Legislative Landscape for Traditional Health Practitioners in Southern African Development Community Countries: A Scoping Review," *BMJ Open* 10, no. 1 (2020): e029958.

185. Renee Street and Christa Rautenbach, "SA Wants to Regulate Traditional Healers—But It's Not Easy," *Sowetan Live*, January 25, 2016, <https://www.sowetanlive.co.za/news/2016-01-25-sa-wants-to-regulate-traditional-healers-but-its-not-easy/>.

Renee Anne Street, "Unpacking the New Proposed Regulations for South African Traditional Health Practitioners," *The South African Medical Journal* 106, no. 4 (2016): 22–3.

Andrew Taylor, Peter Lindsey, and Harriet Davies-Mostert, *An Assessment of the Economic, Social and Conservation Value of the Wildlife Ranching Industry and Its Potential to Support the Green Economy in South Africa* (Johannesburg: The Endangered Wildlife Trust, 2016).

186. "Apartheid and Reactions to It," SAHO: South African History Online, updated August 27, 2019, <https://www.sahistory.org.za/article/apartheid-and-reactions-it>.

and national legislation relevant to health and medicine control, including the Allied Health Professionals Association. CONTRALESA, the Congress of Traditional Leaders of South Africa, plays an important representative role and liaisons with the government with wide representation and areas of concern.¹⁸⁷ The need for traditional healers and cultural practices to be regulated, formalized, and developed has been highlighted and made more urgent by COVID-19.¹⁸⁸

Animal Law Jurisprudence

The Equality clause of the Bill of Rights provides that no person may “unfairly discriminate directly or indirectly against anyone on one or more grounds, including race, gender, sex, pregnancy, marital status, ethnic or social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language and birth.” The state is under the same obligation to prohibit unfair discrimination. Section 15 (Freedom of religion, belief and opinion) provides that everyone has the right to freedom of conscience, religion, thought, belief, and opinion. It is clear that personal and cultural beliefs enjoy significant protection under the constitution, even in the case where such beliefs may be harmful to animals and in apparent contravention of the anti-cruelty provisions of the Animals Protection Act. This was tested in a 2009 case in which an animal rights organisation sought to stop a ritual killing of a bull as part of the Zulu Ukweshwama ritual, which serves in part to ensure the Zulu nation has a strong army to protect the Zulu king.¹⁸⁹ The court rejected the argument that the political circumstances of a modern constitutional democracy no longer require a Zulu army to protect a ceremonial provincial monarch, and that the provisions of the Animal Protection Act should prevail. Instead, the court found that interdicting the killing of the bull would have an impact on the symbolic power of the King, and that such considerations, premised on the constitutional protection of culture and personal belief, should trump considerations of animal cruelty.

The Constitutional Court has recently been more receptive to considering animal interests, as in a landmark, oft-cited 2016 judgement.¹⁹⁰ This judgment held that “...[c]onstitutional values dictate a more caring attitude towards fellow humans, animals and the environment in general...[t]his obligation was especially pertinent because of our history,” and furthermore, that “the rationale behind protecting animal welfare has shifted from merely safeguarding the moral status of humans to placing intrinsic value on animals as individuals.” The decision goes on to state that “Cameron JA’s minority judgment in *Openshaw* recognized that animals are worthy of protection not only because of the reflection that this has on human values, but because animals ‘are sentient beings that are capable of suffering and of experiencing pain.’”¹⁹¹ This judgment has yet to manifest significant changes in executive government policy, though the courts have recognized the judgment and determined that animal welfare needs to be considered in executive decision-making.¹⁹²

187. Padraig O'Malley, “Congress of Traditional Leaders of South Africa (Contralesa),” O'Malley: The Heart of Hope, accessed September 30, 2023, <https://omalley.nelsonmandela.org/omalley/index.php/site/q/03lv02424/04lv02730/05lv02898.htm>.

188. Mmamoshedi Mothibe and Mncengeli Sibanda, “African Traditional Medicine: South African Perspective,” in *Traditional and Complementary Medicine*, ed. Cengiz Mordeniz (London: South Africa: IntechOpen, 2019).

189. *Smit NO and Others v King Goodwill Zwelithini Kabhekuzulu and Others* (10237/2009) [2009] ZAKZPHC 75 (4 December 2009).

190. *National Society for the Prevention of Cruelty to Animals v Minister of Justice and Constitutional Development and Another* 2016 ZA SACC 46.

191. *National Society for the Prevention of Cruelty to Animals v Minister of Justice and Constitutional Development and Another* 2016 ZA SACC 46.

192. *National Council of The Society for Prevention of Cruelty to Animals v Minister of Environmental Affairs and Others* (86515/2017) [2019] ZAGPPHC 367; [2019] 4 All SA 193 (GP) (26 August 2019).

PROSPECTIVE REFORM

South Africa could be considered to be at high risk for zoonotic disease outbreaks and epidemics.¹⁹³ Reasons include socioeconomic conditions, constitutionally supported utilization of wildlife, traditional and cultural practices that use animals but are inadequately regulated, poor law enforcement, high levels of crime (specifically wildlife crimes), and corruption.¹⁹⁴ The South African government has made no formal statement recognizing the link between wildlife trade, live animal markets, and zoonoses. Despite a plethora of information being made available to the Ministries of Health, Environment, and Agriculture highlighting the risk of further zoonotic disease events from wildlife trade, live markets, and intensive animal agricultural practices, government policy remains supportive of aggressive instances of the consumptive use of wildlife like captive breeding of wildlife and the trade in body parts, close confinement farm animal production, and long distance transport of live animals.¹⁹⁵

The Minister of Environment, Forestry, and Fisheries seems oblivious to the scientific consensus in this regard, choosing instead to characterise the risk of zoonotic disease as originating from "... human encroachment into new areas of pristine habitat (mostly in tropical forest areas) resulting in novel contact with previously unexposed populations of wild animals."¹⁹⁶ The Minister notes further that risk derives from:

Harvesting and consumption of certain high risk taxa (notably bats, primates, and certain rodents) for food and live capture of animals and mass confinement in unhygienic marketplaces where they are exposed to other species, including domestic ones, with which they may exchange pathogens (sic). The above conditions do not generally apply in South Africa, in which the consumption of wild (game) meat has a deep cultural history, with generally well-established and safe harvesting, sale and distribution practices, and relatively limited concern of zoonotic disease.¹⁹⁷

During the COVID-19 lockdown, DALRRD published draft amendments to the Meat Safety Act for comment, which make provisions for the slaughter of all species of wild animal for food, including those identified as threatened or protected species. Although the amendments are ostensibly intended to ensure human health standards by regulating the slaughter and processing of animals by including all wild animals in the regulations, the Department has sent a strong signal that it intends to continue with the commodification of wild animal species and their conversion to a state-sanctioned source of food.¹⁹⁸

The most pressing reform would thus seem to be, with respect, that the Ministers of Environment, Agriculture and Health revisit both the science and history of zoonotic diseases, as well as the

193. Bianca Wernecke et al., "Preventing the Next Pandemic" - A 2020 UNEP Frontier Series Report on Zoonotic Diseases with Reflections for South Africa," *South African Journal of Science* 116, no. 7–8 (2020).

194. "Enforcement Agencies (SIU, Hawks and NPA) on COVID-19 Corruption Cases," Parliamentary Monitoring Group, October 20, 2020, <https://pmg.org.za/committee-meeting/31236/>.

195. Humane Society International – Africa has supplied white papers on the risks of live animal markets, wildlife trade, and intensive animal agriculture to the offices of the Ministers concerned. There has been no formal response or engagement with this literature.

196. Letter from the Minister of Forestry, Fisheries and the Environment to Cullinan and Associates Inc., June 9, 2020, Ref. EDMS MCE193396MCE193559.

197. Letter from the Minister of Forestry, Fisheries and the Environment to Cullinan and Associates Inc., June 9, 2020, Ref. EDMS MCE193396MCE193559.

198. In 2019, the Department amended the Animal Improvement Act; those amendments expressly recognized 32 species of wild animals as domestic animals, thus paving the way for those species to be bred, traded, and slaughtered in the same manner as sheep, cows, and pigs.

circumstances of the wild animal trade in South Africa, reconciling the scientific consensus with state policy regarding the use of and trade in animals. Minister Creecy’s framing of the issue ignores entirely the informal markets of all types operating in the country and mischaracterizes the formal markets as safe, when the risks of, for example, tuberculosis in captive-bred lions are well known.

Following the release of the World Health Organization (WHO) guidelines highlighting the zoonotic risks of wildlife farming, there was no official statement from either the Minister of Agriculture nor the Minister of Environment regarding the zoonotic risks of wildlife farming, despite sharing a sign-on letter and HSI White paper with the respective departments.¹⁹⁹ However, in the High-Level Panel report released by the Minister in May 2021, the report records that “South Africa has an established cooperation strategy with the WHO, which may influence its future policy responses to zoonotic disease risk in the wake of the COVID-19 public health crisis.”²⁰⁰ Furthermore, the report acknowledges and embraces the “One Welfare” approach, referencing the recent COVID-19 pandemic as a perfect example of why such an approach is necessary.²⁰¹ This view expressed by Minister Creecy is consistent with formal government communications to date. There has been no recognition of the zoonotic risks of the various markets and practices, both prior to and post-COVID-19. Reform in this regard would recognize the need for ‘qualified and quantified’ risk assessments, mitigation measures, and improved regulations.²⁰² The potential economic benefits, risks to biodiversity, and associated risks with some of the intensive production, commercialization, and agriculturalization of wildlife need to be carefully considered and balanced against the roles these practices may play in poverty mitigation.²⁰³

Further policy reforms to mitigate zoonoses risk should include a review of the practice of expressly intensifying wildlife production. The intensive farming of wild species (both exotic and indigenous) has associated risks, regulatory challenges, and ‘grey areas’ concerning zoonotic and other disease risks, e.g., Clostridial outbreaks in farmed rhino and the development of pathogenic strains of theileriosis in sable antelope.²⁰⁴ Recent published research highlights the potential zoonotic risks associated with the captive breeding of, interaction with, and product use of lions and big cat species. The occurrence of COVID-19 in lions and tigers in zoos, believed to have been contracted from human caretakers, highlights the potential zoonotic risks in human–animal and animal–human transference and the development of potential disease reservoirs.²⁰⁵ South Africa has an estimated

199. “Reducing Public Health Risks Associated with the Sale of Live Wild Animals of Mammalian Species in Traditional Food Markets: Interim Guidance,” World Organisation for Animal Health (OIE), World Health Organization (WHO), and United National Environment Programme (UNEP), April 12, 2021, <http://www.indiaenvironmentportal.org.in/files/file/interim-guidance-wet-markets-WHO.pdf>.

“On World Health Day, Governments Around the World are Urged to Heed the Coronavirus ‘Tipping Point’ and Ban Wildlife Trade to Reduce Risk of Future Pandemics,” Humane Society International, April 7, 2020, <https://www.hsi.org/news-media/world-health-day-ban-wildlife-trade-to-reduce-pandemics/>.

Ronald Orenstein, *Wildlife Markets and COVID-19* (Washington DC: Humane Society International, 2020), <https://www.hsi.org/wp-content/uploads/2020/04/Wildlife-Markets-and-COVID-19-White-Paper.pdf>

200. The High-Level Panel of Experts for the Review of Policies, Legislation and Practices on Matters of Elephant, Lion, Leopard and Rhinoceros Management, Breeding, Hunting, Trade and Handling, High-Level Panel Report For Submission to the Minister of Environment, Forestry and Fisheries, December 15, 2020, https://www.dffe.gov.za/sites/default/files/reports/2020-12-22_high-levelpanel_report.pdf.

201. “About One Welfare,” One Welfare, accessed September 30, 2023, <https://www.onewelfareworld.org/about.html>.

202. Johan L. Bekker, Louw C. Hoffman, and Piet J. Jooste, “Wildlife-associated Zoonotic Diseases in Some Southern African Countries in Relation to Game Meat Safety: A Review,” *The Onderstepoort Journal of Veterinary Research* 79, no. 1 (2012): E1–E12, <http://dx.doi.org/10.4102/ojvr.v79i1.422>.

203. Quest, “Zoonosis: Pathogens That Jump the Species Barrier,” *Quest: Science for South Africa*, 2020.

204. Steven Broad, “Wildlife Trade, COVID-19 and Zoonotic Risks: Shaping the Response,” *TRAFFIC Briefing Paper*, 2020.

Jessica Bell Rizzolo, “Effects of Legalization and Wildlife Farming on Conservation,” *Global Ecology and Conservation* 25 (2021): e01390.

205. Melissa Kennedy et al., “Detection of Feline Coronavirus in Captive Felidae in the USA,” *Journal of Veterinary Diagnostic Investigation* 14, no. 6 (2002): 520–22.

8,000-11,000 lions (and other large cats) in captive breeding facilities.²⁰⁶ The zoonotic risks of intensive breeding are further highlighted by the mink farming situation with human–animal transmission and the recent discovery of the same SARS-CoV-2 strain in wild mink.²⁰⁷ Practices like intensive breeding of wildlife for parts, e.g., captive lion and other big cat breeding that have high and underacknowledged, underquantified zoonotic risks need to be regulated or, preferably, discontinued entirely.²⁰⁸ Wildlife utilization with lower and manageable risks that can contribute to economic development, food security and transformation, e.g., venison production, should be promoted but properly regulated.²⁰⁹

The formalization, enactment, and implementation of the relevant regulations and statutes need to take place with training, accreditation, and associated controls and standards. Traditional medicine should be recognized and utilized for the role that it could play in mitigating risks, addressing COVID-19, and preventing future zoonotic outbreaks. The role played by traditional healers and leaders needs to be more actively incorporated into tackling the pandemic. Illegal and high-risk practices should be identified, with appropriate actions taken to reduce these activities. A One Health approach, recognizing the integral and interdependent relationship between human, animal, and environmental health and wellbeing, should be promoted and should underpin future policy.²¹⁰ In 2014, a One Health Program through the South African Regional Global Disease Detection Centre (SARGDDC), in partnership with the National Institute for Communicable Diseases (NICD) and supported by the CDC's International Emerging Infections Program, was initiated in South Africa, with a major focus on zoonotic disease surveillance.²¹¹

The United Nations Environment Programme has recommended 10 practical steps that governments can take to prevent future zoonotic outbreaks.²¹² These are: 1. Investing in interdisciplinary approaches, including One Health; 2. Expanding scientific enquiry into zoonotic diseases; 3. Improving cost-benefit analyses of interventions to include full-cost accounting of societal impacts of disease; 4. Raising awareness of zoonotic diseases; 5. Strengthening monitoring and regulation practices associated with zoonotic diseases, including food systems; 6. Incentivizing sustainable land management practices and developing alternatives for food security and livelihoods that do not rely on the destruction of habitats and biodiversity; 7. Improving biosecurity and control, identifying key drivers of emerging diseases in animal husbandry, and encouraging proven management and zoonotic disease control measures; 8. Supporting the sustainable management of landscapes and seascapes that enhance sustainable co-existence of agriculture and wildlife; 9. Strengthening capacities among health stakeholders in all countries; 10. Operationalizing the One Health approach in land-use and sustainable development planning, implementation, and monitoring, among other fields.

Research for this project indicates that there are inadequate data on most of the informal, illegal,

206. Department of Forestry, Fisheries and the Environment, "ATC181108: Report on the Portfolio Committee on Environmental Affairs on the Colloquium on Captive Lion Breeding for Hunting in South Africa: Harming or Promoting the Conservation Image of the Country, Held on 21 and 22 August 2018, Dated 8 November 2018," Parliamentary Monitoring Group, accessed on September 29, 2023, <https://pmg.org.za/tailed-committee-report/3595/>.

207. Steven Broad, "Wildlife Trade, COVID-19 and Zoonotic Risks: Shaping the Response," TRAFFIC Briefing Paper, 2020.

208. Steven Broad, "Wildlife Trade, COVID-19 and Zoonotic Risks: Shaping the Response," TRAFFIC Briefing Paper, 2020.

209. Steven Broad, "Wildlife Trade, COVID-19 and Zoonotic Risks: Shaping the Response," TRAFFIC Briefing Paper, 2020. See also: Jessica Bell Rizzolo, "Effects of Legalization and Wildlife Farming on Conservation," *Global Ecology and Conservation* 25 (2021): e01390.

210. Camilla T. O. Benfield et al., "We Must Take a One Health Approach to Improve Human Pandemic Infection Control," *The BMJ Opinion*, September 30, 2020, <https://blogs.bmj.com/bmj/2020/09/30/we-must-take-a-one-health-approach-to-improve-human-pandemic-infection-control/>.

211. "One Health Program: South Africa Regional Global Disease Detection Center." Centers for Disease Control and Prevention, accessed September 30, 2023, https://archive.cdc.gov/#/details?url=https://www.cdc.gov/globalhealth/countries/southafrica/what/one_health.htm.

212. Delia Grace Randolph et al., *Preventing the Next Pandemic: Zoonotic Diseases and How to Break the Chain of Transmission* (Nairobi: United Nations Environment Programme, 2020). See also: Quest, "Zoonosis", 2020.

and traditional markets and supply chains, and also inadequate regulation and enforcement, and that inadequate attention has been given to zoonotic risks by lawmakers and administrative departments. Other than existing regulations and systems, and the lockdowns associated with COVID-19 precautionary and preventive measures to prevent human–human spread, no significant additional measures to reduce risks of transference have been implemented with regard to wildlife and informal markets. Given that many of the drivers of zoonotic diseases exist in South Africa, there is an urgent need for more in-depth research, data collection, and intensified focus, and for identification and quantification of risks, to identify and implement mitigating measures and reforms to legislation, regulation, enforcement, and management across a wide range of markets, supply chains, and activities.²¹³

The following further reforms are presented as proposals: 1. Acknowledgment of the risks of zoonosis and causal and contributory factors and implementation of appropriate awareness and education programs; 2. In depth, science-based data collection, collation, and evaluation on zoonotic risks, pressure points, and mitigating preventative measures identified and implemented; 3. Improvement of regulatory framework and enforcement; 4. Identification of high-risk activities – mitigation measures implemented, reduction or cessation where risk cannot be mitigated; 5. Improved infrastructure to support the prior; 6. Poverty alleviation; 7. Alternate, less harmful and extractive, uses of wildlife to supersede the current consumptive use model; 8. A transition to restorative agricultural practices and the reduction or cessation of intensive practices such as commodification and domestication of game through intensive breeding; 9. Stronger enforcement addressing the criminal component, and reducing corruption would allow the informal sector to operate and grow.

In addition: Informal markets must become more formalized, which must be supported through infrastructure, environment, and regulatory frameworks via set-up funding, training, and skills development. The supply of legal, safe, and humanely procured products (meat and parts) would reduce disease risks, as would the provision of training, education, and awareness around zoonotic disease risks, hygiene, sanitation, and so on at a community level.

Conflicting mandates between national Departments of Agriculture and Environment must be resolved. Standards and regulations on captive, managed, and farmed wildlife must be developed. Activities that are considered high risk from a human health, biodiversity, and welfare perspective should be reduced or restricted. Also, all animals, including free range wildlife, are included under current animal welfare legislation, but the wildlife ranching industry resists implementing welfare provisions required by the courts. The NSPCA is responsible for enforcing and promoting animal welfare, but it is a nonprofit organization with limited statutory powers. The NPSCA reports to the DALRRD Minister in a clear conflict of interest: DALRRD is focused on expanding animal production. This conflict needs to be addressed, alongside recognition of animal welfare standards as a component of mitigating zoonotic disease risks. The NSPCA's work needs to be properly enabled by public funds.

The South African wildlife model, with agriculturalization and intensification of wildlife production, and the application and interpretation of 'sustainable utilization,' needs to be reconsidered. The associated risks must be assessed and acknowledged. Activities with a genuine biodiversity and conservation basis that are sustainable, ethical, and equitable should be supported by appropriate

213. Delia Grace Randolph et al., *Preventing the Next Pandemic: Zoonotic Diseases and How to Break the Chain of Transmission* (Nairobi: United Nations Environment Programme, 2020). See also: Quest, "Zoonosis", 2020.

regulation and enforcement, and enabling factors implemented.²¹⁴ High risk and potentially harmful practices should be phased out.

Traditional, religious, and cultural practices are protected constitutionally and fulfil important roles and functions in society. These functions should be maintained and supported.²¹⁵ However, these practices' zoonotic risk should be identified, and corresponding changes in behaviour and practice sought through engagement, education, and regulation. Awareness and education on zoonotic disease (and the risk of future pandemics), with improved public health, and food safety and production, is critical. So is a decreased dependence on and a phase-out of 'cheap' animal proteins and harmful, inhumane farming and production methods that increase and contribute to zoonotic risks. Efforts to phase in a One Health approach, restorative agriculture, and decreased meat consumption would all contribute positively to a reduction in zoonotic health risks.²¹⁶ The reforms needed to reduce zoonotic disease risks would need to include widespread socioeconomic improvement of living conditions, health, employment, and educational standards, and the reduction of crime and corruption.²¹⁷

CONCLUSION

UNEP Executive Director Inger Andersen has said:

The science is clear that if we keep exploiting wildlife and destroying our ecosystems, then we can expect to see a steady stream of these diseases jumping from animals to humans in the years ahead ... Pandemics are devastating to our lives and our economies, and as we have seen over the past months, it is the poorest and the most vulnerable who suffer the most. To prevent future outbreaks, we must become much more deliberate about protecting our natural environment.²¹⁸

South Africa demonstrates many risk factors for the emergence and transmission of zoonoses: the production of large numbers of animals and animal products in circumstances where animal health is systemically compromised; different species are kept in close proximity; live animals are transported long distances; and animals are slaughtered and consumed in unsanitary conditions. Many of these conditions exist in South Africa's industrialized food chain, though extensive regulation does exist in this market to protect human health. However, many risk factors also exist in the state-supported wildlife economy, the extent and sophistication of which is unique to South Africa. Informal markets trading in companion, domestic, and wildlife species also exist in many different contexts, and the conditions

214. Andrew Taylor, Peter Lindsey, and Harriet Davies-Mostert, *An Assessment of the Economic, Social and Conservation Value of the Wildlife Ranching Industry and Its Potential to Support the Green Economy in South Africa* (Johannesburg: The Endangered Wildlife Trust, 2016).

215. Thembelihle Zuma et al., "The Role of Traditional Health Practitioners in Rural Kwazulu-Natal, South Africa: Generic or Mode Specific?" *BMC Complementary and Alternative Medicine* 16, no. 1 (2016): 304.

216. Thembelihle Zuma et al., "The Role of Traditional Health Practitioners in Rural Kwazulu-Natal, South Africa: Generic or Mode Specific?" *BMC Complementary and Alternative Medicine* 16, no. 1 (2016): 304. See also:

217. Johan L. Bekker, Louw C. Hoffman, and Piet J. Jooste, "Wildlife-associated Zoonotic Diseases in Some Southern African Countries in Relation to Game Meat Safety: A Review," *The Onderstepoort Journal of Veterinary Research* 79, no. 1 (2012): E1–E12, <http://dx.doi.org/10.4102/ojvr.v79i1.422>.

Douglas Broom, "This Is How We Prevent Future Pandemics, Say 22 Leading Scientists," *World Economic Forum*, November 27, 2020, <https://www.weforum.org/agenda/2020/11/covid-19-pandemics-nature-scientists/>.

Bram Büscher et al., "Planning for a World Beyond COVID-19: Five Pillars for Post-Neoliberal Development," *World Development* 140 (2021): 105357.

218. Bianca Wernecke et al., "Preventing the Next Pandemic" - A 2020 UNEP Frontier Series Report on Zoonotic Diseases with Reflections for South Africa," *South African Journal of Science* 116, no. 7–8 (2020).

these animals endure are poorly understood and functionally unregulated. The state is yet to formally recognize any of these systemic risks, and despite the significant impacts of COVID-19, it continues to promote the further commodification and trade in animals, especially wild animal species. The precarious socioeconomic circumstances of many South Africans is expected to progressively worsen in the short-term due to the impacts of COVID-19 lockdowns, forcing people to source alternative sources of food and income. This trend can reasonably be expected to increase risk of zoonotic disease, as people increasingly turn to wild animals as a resource in contexts where there is no practical enforcement of health protocols.

Many of the required state responses to reduce the risk of zoonoses can be achieved in the short and medium term changes to policy, such as improving regulation and enforcement. However, other problems, such as persistent poverty, poor public health systems, increasing unemployment, rapid urbanization and overcrowding, and inadequate infrastructure, hygiene, and sanitation, all require sustained systemic interventions over a prolonged period.