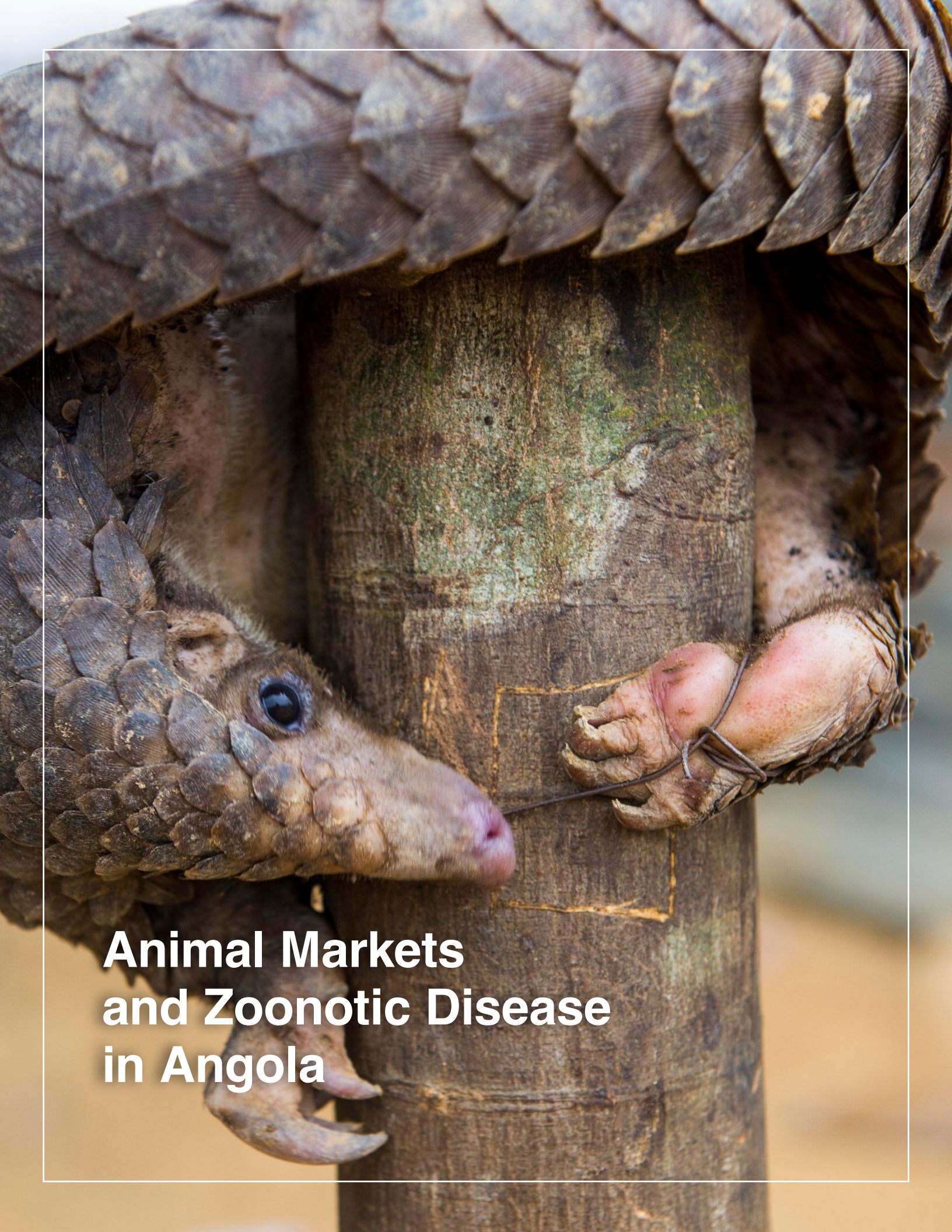

Animal Markets and Zoonotic Disease in Angola

COUNTRY SUMMARY: ANGOLA

CULTURAL CONTEXT

Angola is a biodiversity hotspot, and both a source and transit country of cross-border illegal trade and active in-country illegal trade. Decades of conflict and civil war in Angola have contributed to displacement, poverty, and food insecurity, increasing subsistence hunting of wild meat. Currently, livestock production in Angola is undergoing what appears to be an inevitable, large-scale, and internationally-funded effort to capitalize upon the country's known natural resources and to expand and intensify industrial food systems. And as international petroleum systems and agro-industrial investment in Angola and attendant roadways and infrastructure renovations lead to further deforestation and excavation, the threat of habitat disruption, commonly associated with zoonotic outbreaks, continues to rise. And even as development is bringing foreign and private investment into the country, prized for its arable land and possible agro-industrial potential, millions of Angolans remain food insecure.

ANIMAL MARKETS

Angola presents a potentially dangerous intersection of legal and illegal wildlife use (including wild meat consumption practices) alongside expanding livestock production. Angola's internal illegal wildlife trade proceeds as a thriving wild meat market throughout the country along the main roads and near cities. Wild Meat in all locations is often handled in poor sanitary conditions, with meat laying out in the open without packaging, cooling measures, or disease testing. Angola is connected to an international network of wildlife trade that drives high risk human-animal interactions and zoonotic risk from wildlife.

DRIVERS OF ZOONOTIC DISEASE RISKS

Wildlife, reservoirs for new and emerging infectious diseases, are increasingly being forced into close contact with humans and livestock in Angola. As roads are built, hunters move farther into areas of once protected land in search of wild meat. Cattle and pigs are bred and reared closer to wildlife habitat; the physical space separating wildlife, humans and livestock continues to decrease. There are more touchpoints among them, and shared areas where viruses that persist in the environment can spillover to humans. Many of Angola's public health challenges, including the handling and consuming of wild meat, are rooted in socioeconomic factors. Even where legal, practices related to hunting, selling, and consumption of wild meat across Angola are marked by poor sanitation and a lack of safety precautions when hunting, processing, and selling animals. The risk of zoonotic disease is pronounced and ubiquitous.

RISK MITIGATION AND RELEVANT CHALLENGES

Among Angola's most pressing challenges are the government's attempt to diversify its economy, address climate change, and revitalize its rural economy and agricultural resources in tandem. The Angolan government is undertaking expanded regulatory efforts targeting the illegal wildlife, with particular attention on poaching traffic and wild meat consumption and, more recently, on the connection of the wildlife trade to zoonotic risk, for example, in emphasizing the role of habitat disruption in driving outbreaks. There are existing regulatory laws on controlling zoonotic risks, including the issue of imported wild and livestock animals, which are overseen by the Veterinary Services Institute. Enforcement, laboratory testing and surveillance, however, are limited and insufficient to mitigate risks of zoonotic disease associated with the broad and expanding illegal and legal wild meat trades. Given the promise of Angola's agricultural resources and the very widespread interest in investing in its increasing production, it is urgent that Angolan policymakers and law enforcement as well as global investors consider attendant zoonotic risks associated with land-use change and increased utilization of wildlife.

AUTHORS

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TABLE OF CONTENTS: ANGOLA

CONTEXT

As with all of the countries in this report, Angola is a nation of particular concern regarding zoonoses and spillover risk due to many complex and dynamic drivers of disease and pathogen spread. First and foremost, there has been long-standing international concern regarding Angolan wildlife trade and the wild meat market.[1] Angola is both a source and transit country of cross-border illegal trade and active in-country illegal trade.[2] The Angolan government is undertaking expanded regulatory efforts targeting the illegal wildlife, with particular attention on poaching traffic and wild meat consumption and, more recently, on the connection of the wildlife trade to zoonotic risk, for example in terms of habitat disruption. Even where legal, practices related to hunting, selling and consumption of wild meat across Angola tend to involve poor sanitation, lack of hygiene and general safety precautions when hunting, processing and selling animals.[3] [4] Decades of war and civil war in Angola contributed to displacement, poverty, and food insecurity, increasing subsistent hunting of wild meat.[5] And as international petroleum systems and agro-industrial investment in Angola and attendant roadways and infrastructure renovations lead to further deforestation and excavation, the threat of habitat disruption most commonly associated with novel pandemic outbreaks continues to rise.[6] Currently, livestock production in Angola is undergoing what appears to be an inevitable, large-scale, and internationally funded effort to capitalize upon the country's known natural resources and develop expanded and intensified industrial food systems. Wildlife are reservoirs for new and emerging infectious diseases, and as roads and hunters move further into areas of protected land in search of wild meat, and as cattle and pigs are reared and bred closer to wildlife habitat, the physical space across wildlife, humans and livestock decrease—there are more touchpoints among them, and shared land where viruses that persist in the environment can take hold and spread.

1. See, for example, the 2016 BBC report, "Inside Africa's biggest wild meat market in Angola" for further address of how the country's period of Civil War motivated heavy reliance on wild meat and, more recently, how crackdowns on the illegal wildlife trade have come about: "Inside Africa's Biggest wild meat Market in Angola," BBC News, June 7, 2016, https://www.bbc.com/news/world-africa-36457637.
2. The 2020 Library of Congress report on wet markets worldwide includes the following assessment of Angola: "The meat trade in Angola is regulated by Provincial Decree No. 92 of October 8, 1974. The regulation defines game (caça ou bravio) as wild animal species, whose meat can be legally sold; small game as all birds, rodents and reptiles, amphibians or not, whose hunting is not prohibited; big game as all wild animals not covered by the designation small game whose hunting is not prohibited; game meat (peça de caça) as wild animal after being slaughtered; sanitary license as an indispensable document to assess the operating conditions of the establishment from a hygienic-sanitary point of view, and butchery (talho) as an establishment that is exclusively for the sale of meat." Law Library of Congress, "Regulation of Wild Animal Wet Markets in Selected Jurisdictions," August 2020: 5,https://www.loc.gov/law/help/wet-markets/wild-animal-wet-markets.pdf, and citing: Regulamento do Comércio de Carnes, Decreto Provincial No. 92/74, de 8 de Outubro. https://perma.cc/7XHF-8VRB.
3. Elena Bersacola et al., "Hunted in Angola: Surveying the wild meat Trade," SWARA, January–March 2014, 31–36, https://www.eawildlife.org/DigitalSwaraMagazine/EAWLS_Swara_Magazine_01_2014.pdf.
4. Jose Pedro Agonstinho, Antonio Jose Rafael. Independent Research: Angola Animal Markets. ORBIS Angola and Brooks McCormick Jr., Animal Law & Policy Program, Fall and Winter 2019-2020.
5. See for example Braga-Pereira et al., who note that "[m]any developed and developing countries have succumbed to prolonged civil wars and other armed conflicts throughout modern human history, leaving more than 30 million people displaced in the last 20 years alone. Contemporary wars often result in politically inaccessible areas for resource users, particularly where landmines are widely and unpredictably scattered, severely discouraging human settlements and game hunters, thereby creating potential game refuges as passive 'no-take' areas. However, armed conflicts can induce dramatic direct and indirect impacts on wildlife populations and natural ecosystems. Civil wars can dismantle the 'law-and-order' structure of conservation institutions and vastly increase the availability of automatic weapons and ammunition, which can be used by residents, political refugees and military troops to deplete wild game for subsistence and trade in both military and paramilitary areas." Braga-Pereira et al., "Warfare-induced mammal population declines in SW Africa are mediated by species life history, habitat type and hunter preferences," Scientific Reports 10, Article 15428 (2020): 1, https://www.nature.com/articles/s41598-020-71501-0.
6. Angola is second only to Saudi Arabia as a source for oil to China and is the second largest oil producer in all of Africa after Nigeria. It is forecast to surpass Nigeria. Angola has been known for offshore production to date. "Background Reference: Angola," U.S. Energy Information Administration, last modified January 25, 2021, https://www.eia.gov/international/content/analysis/countries_long/Angola/background.htm. However, upon the news that Angola would open up nature preserves to oil exploration in early 2021 announcements, forecasts for Angola's onshore production are driving rapid and expansive exploration of onshore blocks that "not only represent some of the least explored basins globally, but also appear to grow in size with each new appraisal. According to an evaluation of its oil and gas prospects last November, Angola is estimated to hold up to 57 billion barrels of oil and 27 trillion cubic feet of gas – a substantial increase from previous estimates of 8.2 billion barrels and 13.5 trillion cubic feet – which would afford the country the largest oil reserves on the continent." https://www.africanews.com/2021/04/08/new-discoveries-in-angola-s-prolific-basins-fuel-interest-in-ongoing-bid-round//.

As such, Angola presents a potentially dangerous intersection of known illegal wildlife use and wild meat consumption practices alongside expanding livestock production. Angola's internal illegal wildlife trade proceeds as a thriving wild meat market throughout the country along the main roads and near cities.[7] wild meat in all locations is handled in very poor sanitary conditions, with meat laying out in the open without packaging, cooling measures, or surveillance/testing for disease. The risk of zoonotic disease is pronounced and ubiquitous. There are existing regulatory laws on controlling zoonotic risks, including the issue of imported wild and livestock animals, all overseen by the Veterinary Services Institute (ISV).[8] Enforcement, laboratory testing and surveillance, however, are limited and insufficient to mitigate risks of zoonotic disease associated with the broad and expanding[9] illegal and legal wild meat trades.

Many of Angola's challenges and the practices and behaviors of handling and consuming wild meat are driven by socioeconomic factors; even as development is bringing foreign and private investment into the country, prized for its arable land and possible agro-industrial potential, millions of Angolans are starving. Some have been driven to eating lombi—green leaves that grow in the bushes—even as it sickens some people, especially children, with diarrhea. [10] Some reports indicate that amid drought associated with climate change and decisions to privilege commercial and large-scale farmers and livestock producers over local families and their subsistence farms, poverty is spreading, increasing food insecurity.[11] [12] Many local hunters refer to hunting as a "sacrifice," a hardship, and a dangerous and unrewarding activity, and say they would prefer not to hunt if they had a good alternative to sustain their family. Hunting practices—including trapping wildlife by burning their habitat and leaving out nets and snares that can capture multiple animals at once, including very high-risk species like bats (even if they're not the desired prey),[13] are just a couple examples of potential disease-driving activity.

Angola is not alone in all of these challenges, which in many respects extend beyond its borders. Like many other countries in this report, Angola is connected to an international network of wildlife trade that drives risky behavior. For example, there is a high-end luxury market for wild meat in Europe that is illegal and therefore unregulated; a recent study found that large quantities of wild meat exported out of Angola are directed to this market in Belgium, and the wild meat is often mislabeled. Sable Antelope,

7. Huntley et al. Biodiversity Conservation: History, Protected Areas, and Hotspots. (2019), 505. https://www.repository.utl.pt/bitstream/10400.5/17771/1/REP-CEABN-Biodiversity-978-3-030-03083-4_18.pdf
"One of the immediate causes of population declines and species loss in vertebrates since 1975 has been hunting for wild meat during the war by rural communities faced with starvation and by soldiers seeking to supplement very limited rations." (505) And furthermore, that "[f]ollowing international condemnation of the practice, trading in ivory has been banned in Angola since 2017, but the elephant population is estimated to have decreased by 21% from 2005 to 2015 (Schlossberg et al. 2018)."
A 2020 United Nations Office on Drugs and Crime World Wildlife Crime Report on Trafficking in protected species indicates: "dead elephants detected in aerial surveys gives some indication of the variation in threats faced across the continent, and high shares of dead elephants relative to live elephants in Cameroon (83%), Mozambique (32%), Angola (30%) and the United Republic of Tanzania (26%) show higher mortality risk in these areas. High carcass ratios, possibly indicat[e] high poaching levels." (50) "World Wildlife Crime Report: Trafficking in Protected Species," United Nations Office on Drugs and Crime, July 9, 2020, https://www.unodc.org/documents/data-and-analysis/wildlife/2020/World_Wildlife_Report_2020_9July.pdf.

8. Law No. 4/04, Art. 22, http://extwprlegs1.fao.org/docs/pdf/ang49571.pdf.

9. Jose Pedro Agonstinho, Antonio Jose Rafael. Independent Research: Angola Animal Markets. ORBIS Angola and Brooks McCormick Jr., Animal Law & Policy Program, Fall and Winter 2019-2020.

10. J. S. von Dacre, "Angola, Commercial Cattle Farming Creates Hunger Crisis for Thousands," InsideOver, November 4, 2019, https://www.insideover.com/society/angola-commercial-cattle-farming-creates-hunger-crisis-for-thousands.html.

11. J. S. von Dacre, "Angola, Commercial Cattle Farming Creates Hunger Crisis for Thousands," InsideOver, November 4, 2019, *https://www.insideover.com/society/angola-commercial-cattle-farming-creates-hunger-crisis-for-thousands.html*.

12. "Angola: Drought and Commercial Cattle Farming Exposes Tens of Thousands to Devastating Hunger," Amnesty International, October 15, 2019, *https://www.amnesty.org/en/latest/press-release/2019/10/angola-drought-and-commercial-cattle-farming-exposes-tens-of-thousands-to-devastating-hunger/#:~:text=Tens%20of%20thousands%20of%20pastoral,published%20by%20Amnesty%20International%20today*.

13. Elena Bersacola et al., "Hunted in Angola: Surveying the wild meat Trade," SWARA, January–March 2014, 31–36, *https://www.researchgate.net/publication/260263589_Hunted_in_Angola_surveying_the_wild meat_trade*.

for example, nearly extinct from overhunting and prized for its flavor, has been written on packages that actually include primate meat[14]--which is very high risk given some of the zoonoses of concern in Angola, namely Ebola and Marburg.

There is nevertheless opportunity, investment, and the beginnings of the kind of transparency and education that are fundamental to a OneHealth approach, particularly regarding recent concerns about mpox outbreaks.[15] In addition, there is research available from other Sub-Saharan countries that bears importantly on diseases such as Marburg, and that may present opportunities for collaboration across borders.[16] Given the promise of Angola's agricultural resources and the very widespread interest in investing in its increasing production, it is urgent that Angolan policymakers and law enforcement as well as global investors give zoonotic disease in Angola the critical attention it merits.

GEOGRAPHICAL, POLITICAL, SOCIOECONOMIC BACKGROUND

Angola is located in southwestern Africa. It is approximately 1.25 million square kilometers, with an estimated 2023 population of 34,031,000. The capital is Luanda, a port city situated on the north coast. Angola is bordered to the west by the Atlantic Ocean, to the northwest by the Republic of Congo, and to the southeast by Zambia, and to the south by Namibia. The Congo River is the border between Angola and the Democratic Republic of the Congo, to the north and northeast. The climate is tropical, including a dry season that, impacted and prolonged by effects of climate change, has led to extreme drought. The country's geography include semidesert, rainforest, highlands, and densely populated towns and cities of the north coast and north-central river valleys. Much of Angola's dense rainforest has been destroyed by agriculture and logging; grasslands have replaced much of the forest. The far southwest is desert. There are many national parks and nature reserves that house wildlife, which bear significantly on Angolans' relationship with animals as well as zoonotic risk. As funding from foreign development aid and private investment increase, including contributions to roads and other infrastructure, access to these remote places and their wildlife—as sources of food, income, and emerging infectious disease—are increasing as well.

Luanda reflects Angola's 21st-century aspirations and tumultuous history, including years of civil war as well as anticolonial struggle from 1961-1975; land mines, malnutrition and crushing poverty are common and also bear on Angolans' relationship with and use of animals and land. The official language is Portuguese. However, generally Angolans speak Bantu languages of the Niger-Congo language family and 20th century attempts to make Portuguese the only spoken language have not been successful; in some areas, only indigenous languages are spoken. Since independence from Portugal in 1975, the government recognizes African languages, though the intended use of them in education has not occurred. There are ongoing efforts in Angola to develop a cohesive national language policy that would

14. Gombeer et al., "Exploring the wild meat Market in Brussels, Belgium: a Clandestine Luxury Business," Biodiversity and Conservation 30, (2021): 55-66, https://link.springer.com/article/10.1007/s10531-020-02074-7.
15. "WHO Supports Strengthening Monkeypox Prevention," World Health Organization, June 23, 2022, *https://www.afro.who.int/countries/angola/news/who-supports-strengthening-monkeypox-prevention*.
16. Brian R. Amman et al., "Isolation of Angola-like Marburg Virus from Egyptian Rousette Bats from West Africa," Nature Communications 11, (2020): Article 510, https://www.nature.com/articles/s41467-020-14327-8.

both preserve indigenous languages and cultural histories as well as provide language instruction in schools, in multiple languages. This fracturing of communication may pose significant challenges when it comes to efficiently educating smallholder, subsistence farmers as well as urban dwellers about health and disease risk.

Angola is a biodiversity hotspot, home to the source of the waters of the Okavango Delta. Angola is still working to build a strong and realistic regulatory regime and enforcement infrastructure, though there is strong wildlife conservation focus on iconic species such as the Giant Sable. Significant efforts have been made to increase protected areas and take strong measures to protect endemic wildlife, as well as to ensure that Angola is not a safe haven for wildlife traffickers. At the same time, a growing population and development needs also impact Angola's resources and prioritization of government resources. Strong leadership, stimuli, and support from several international partner organizations and institutions continue to push Angolan leadership in southern Africa on wildlife conservation. Legislation continues to employ strong anti-trafficking measures coupled with fair treatment of subsistence and livelihood needs for a growing population. In the process, Angola may remain a stronghold of rich biodiversity. In April 1998, the country ratified the Convention on Biological Diversity. To meet its national and international obligations, the country approved its National Biodiversity Strategy and Action Plan, 2019-2025.[17]

Rural populations live in the highlands and in their watershed, along rivers and tributaries. There are still nomads in remote areas of the far south, where traditions of keeping cattle and seeking pasture affected settlement. In the north and center of the country, people live in villages.When Angola gained independence in 1975, 90% of the population was rural. Now about 60% of the population lives in rural communities. Angola's birth rate is among the highest in the world but so is its infant mortality rate. Life expectancy is likewise among the lowest in the world; half its population is younger than 15 years old, and a quarter is between 15 and 29 years old.[18]

During Angola's colonial period and before gaining independence, family-based farming was productive across a variety of crops, but civil war (1975-2002)—primarily a fight for power between two liberation movements—led to collapse of its commercial agricultural production. During the civil war, most small-scale farmers returned to subsistence farming[19] and hunting. While the country is potentially a rich agricultural country, with abundant arable land and suitable climate for a variety of products, only 10% of 35 million hectares are in use.[20] About 80% of Angolan farmers are smallholders, raising chickens, goats, pigs and cattle on small plots with very low productivity. In 1985 the government moved the majority of rural trade into private companies.[21] Urban residents are heavily dependent on imports, and rural residents displaced by war became "completely dependent on food aid from foreign donors." Also in the fallout of war, livestock production declined significantly; production of cattle and pigs fell from 36,500

17. Ricardo Dias, "Angola: Angola Reduces Number of Ministries and Makes Key Changes," United States Department of Agriculture Foreign Agricultural Service, April 3, 2020, https://www.fas.usda.gov/data/angola-angola-reduces-number-ministries-and-makes-key-changes.
18. John Kelly Thornton and William Gervase Clarence-Smith, "Angola," Encyclopædia Britannica, last updated August 27, 2023, www.britanica.com/place/Angola.
19. "Agriculture in Angola," Wikipedia, last modified November 21, 2022, *https://en.wikipedia.org/wiki/Agriculture_in_Angola*.
20. Izabela Leao and Shobha Shetty, "Towards Improved Water and Food Security: Angola's Potential as Future Agriculture Powerhouse of Africa," World Bank, September 7, 2022, *https://blogs.worldbank.org/africacan/towards-improved-water-and-food-security-angolas-potential-future-agriculture-powerhouse*.
21. "Agriculture in Angola," Wikipedia, last modified November 21, 2022, *https://en.wikipedia.org/wiki/Agriculture_in_Angola*.

tons slaughtered in 1973 to 5,000 in the 1980s. This was caused by many factors, including departure of commercial farmers, disruption from the war, and the deterioration of facilities and services, especially vaccinations.[22] The ensuing dependence on imports is behind many new and emerging initiatives—many funded by private investors and development banks—to reinvigorate livestock production both on industrial and smallholder scales.

Amidst this existing and aspirational development, Angola's vulnerability to the effects of climate change has been escalating, including the most severe drought in the last 40 years, seriously impacting agricultural, livestock and fisheries sectors at an estimated damage of over $749 million as of September of 2022. Projections suggest that drought, shorter and more concentrated rainy seasons, higher temperatures and water scarcity will affect crop yields by 4% to 30% by 2050. By that same time, it is estimated that extreme climate will affect some 70% of livestock; it is already currently impacting 40%.[23]

Among Angola's most pressing challenges are the government's attempt to diversify its economy, address climate change, and revitalize its rural economy and agricultural resources in tandem.[24] But these efforts are proving difficult and slow. Landmines prevent cultivation of large areas of land, functional infrastructure in rural areas is limited, and perhaps most significantly, there is little incentive for people to return to farming. Three years into severe drought, hunger is pervasive and farmers are losing livestock; it is considered by some to be a humanitarian and environmental disaster.[25] Many are migrating to Namibia or urban centers. Infrastructure failure and problems with the government's resource distribution and focus have been identified as problems. For example, existing transportation and energy networks needed maintenance and repair, but the government has focused many resources instead on new longer term projects, like large-scale farming initiatives that bypassed the needs of traditional farmers and herders.[26]

ZOONOTIC DISEASES OF CONCERN

There are several zoonotic diseases of concern in Angola. Of particular concern are emerging infectious diseases among wildlife hunted for wild meat that spread both within Angola and over its borders, including the Democratic Republic of Congo (site of a current Ebola outbreak), and countries of destination for the wildlife trade, including correctly and incorrectly labeled wild meat sent to European markets.[27] These emerging infectious diseases are also of significant concern in Angola due to the country's pervasive practice and even cultural and economic dependency upon hunting and consuming

22. "Agriculture in Angola," Wikipedia, last modified November 21, 2022, *https://en.wikipedia.org/wiki/Agriculture_in_Angola*.
23. Izabela Leao and Shobha Shetty, "Towards Improved Water and Food Security: Angola's Potential as Future Agriculture Powerhouse of Africa," World Bank, September 7, 2022, *https://blogs.worldbank.org/africacan/towards-improved-water-and-food-security-angolas-potential-future-agriculture-powerhouse*.
24. Izabela Leao and Shobha Shetty, "Towards Improved Water and Food Security: Angola's Potential as Future Agriculture Powerhouse of Africa," World Bank, September 7, 2022, *https://blogs.worldbank.org/africacan/towards-improved-water-and-food-security-angolas-potential-future-agriculture-powerhouse*.
25. Ruy Llera Blanes, "How Not to Respond to Drought: Lessons from Angola," The Conversation, August 9, 2022, *https://theconversation.com/how-not-to-respond-to-drought-lessons-from-angola-188015*.
26. Ruy Llera Blanes, "How Not to Respond to Drought: Lessons from Angola," The Conversation, August 9, 2022, *https://theconversation.com/how-not-to-respond-to-drought-lessons-from-angola-188015*.
27. Gombeer et al., "Exploring the wild meat Market in Brussels, Belgium: a Clandestine Luxury Business," Biodiversity and Conservation 30, (2021): 55-66, https://link.springer.com/article/10.1007/s10531-020-02074-7.

wild meat, particularly as infrastructure funded by development aid and private investors brings new roads into remote areas like national parks that host wildlife.

Angola has already experienced major spillover events. It is the source of the most lethal strain of Marburg Fever. Rabies is endemic and a major public health concern; however, wildlife (and perhaps local dogs who are reportedly to blame) are not surveilled or monitored. Angola is also rightly concerned about the Ebola outbreak in neighboring Democratic Republic of Congo and Uganda that is not yet under control, and about mpox, which is not yet endemic in Angola. Emerging infectious diseases are also of serious concern in Angola due to its pervasive practice of, and even cultural and economic dependency upon, hunting and consuming wild meat, particularly as infrastructure funded by development aid and private investors brings new roads into remote areas like national parks that host wildlife, and as industrial-scale livestock production increasingly occupies Angola land.

Marburg Fever

Marburg Fever is closely related to Ebola and regionally there have been 12 known outbreaks, with the most recent one in 2017 in Uganda.[28] Marburg was first identified in 1967 among laboratory technicians in Germany working with monkeys imported from Uganda. There have been six recorded outbreaks of the disease since then. Marburg is a hemorrhagic fever that kills its victims from extensive bleeding, internally or from orifices, including eyes and pores.[29] The 2004-2005 Marburg outbreak killed 227 of 252 people infected (90% fatality) in the Angolan province of Uige in 2004-2005.[30] (This compares with a 40% fatality rate of Ebola in the 2014-2016 outbreak in West Africa.[31]) A person infected with the virus may appear healthy for several days, as the incubation period for the virus extends from 10 days to three weeks. At the time of this global outbreak in 2004, Angolans were terrified, making runs on bleach and keeping their children home from school. The Angolan strain of the virus seems to be more virulent than all other strains since and so far identified. There is no known cure or vaccine for Marburg.[32]

Direct spillover from bats in the Marburg outbreak in Angola was not definitively shown.[33] However, in an important 2020 study, this strain as well as other strains were positively detected in 2.5% of Egyptian rousette bats.[34] Myriad and extensive studies had already shown the regional cave-dwelling Egyptian rousette bat is a natural reservoir of Marburg Fever. The virus is shed in saliva and urine, and it can persist for weeks in tissue like the liver, spleen and lymph nodes. This species of fruit bat (and cave-dwelling bat) is found across Africa, the Middle East, the Mediterranean, and the Indian subcontinent.[35]

28. Brian R. Amman et al., "Isolation of Angola-like Marburg Virus from Egyptian Rousette Bats from West Africa," Nature Communications 11, (2020): Article 510, https://www.nature.com/articles/s41467-020-14327-8.
29. Andrew Meldrum, "Africa Strives to Contain Ebola-like Virus After 150 Die in Angola," The Guardian, April 4, 2005, https://www.theguardian.com/science/2005/apr/05/medicineandhealth.lifeandhealth#:~:text=An%20outbreak%20of%20an%20Ebola,to%20contain%20the%20deadly%20disease.
30. Nele Teutloff et al., "Hunting Techniques and Their Harvest as Indicators of Mammal Diversity and Threat in Northern Angola," European Journal of Wildlife Research 67 (2021): 101, https://link.springer.com/article/10.1007/s10344-021-01541-y.
31. "Marburg Virus Found Circulating in Bats in West Africa," Centers for Disease Control and Prevention, last reviewed January 24, 2020, https://www.cdc.gov/media/releases/2020/s0124-marburg-virus.html.
32. Andrew Meldrum, "Africa Strives to Contain Ebola-like Virus After 150 Die in Angola," The Guardian, April 4, 2005, https://www.theguardian.com/science/2005/apr/05/medicineandhealth.lifeandhealth#:~:text=An%20outbreak%20of%20an%20Ebola,to%20contain%20the%20deadly%20disease.
33. "Marburg Virus Found Circulating in Bats in West Africa," Centers for Disease Control and Prevention, January 24, 2020, https://www.cdc.gov/media/releases/2020/s0124-marburg-virus.html.
34. Brian R. Amman et al., "Isolation of Angola-like Marburg Virus from Egyptian Rousette Bats from West Africa," Nature Communications 11, (2020): Article 510, *https://www.nature.com/articles/s41467-020-14327-8*.
35. "Egyptian Fruit Bats: Egyptian Rousette," Animalia, accessed August 29, 2023, https://animalia.bio/egyptian-fruit-batpo.

They eat many kinds of fruit, including those eaten by humans.[36] In experiments, the virus transmitted directly between bats, and some bats have been shown to be super-shedders.[37] In equatorial Africa, these bats live in large, dense colonies that can number over 100,000 bats and can breed twice a year, producing thousands of susceptible juvenile bats every six months in a single roost. Field studies in Uganda showed 2%-3% of all such bats are infected with Marburg viruses at any given time, and that infection levels spike twice a year, up to 12% on average, in juvenile bats. Further, these spikes are associated with increased risk of human exposure, coinciding with at least 84% of known Marburg virus spillover events.[38] The "clear and unwavering recommendation by the authors of this [study] is for individuals…to avoid these bats."[39]

While not in Angola, the findings of this study were subsequently used in neighboring Sierra Leone to implement evidence-based public health messaging to at-risk communities about spillover risk using a comprehensive One Health communications approach.[40] [41]

Rabies

Rabies is a major zoonotic disease concern in Angola, where it kills nearly 200 people annually.[42] It is endemic, and its spread indicates the level of challenge Angolans face in terms of veterinary care and communication regarding zoonotic risk—particularly the extent to which surveillance and monitoring of both wildlife and domestic animals is needed.[43] In Southern Africa, four genotypes of the lyssavirus (which cause rabies) are endemic, including Genotype 1 (Rabies virus, RABV), Genotype 2 (Lagos bat virus, LBV), Genotype 3 (Mokola virus, MOKV) and Genotype 4 (Duvenhage virus, DUVV). Human infections are mostly due to the canine biotype of RABV.[44] The domestic dog is reported to be the main

36. "Marburg Virus Found Circulating in Bats in West Africa," Centers for Disease Control and Prevention, January 24, 2020, https://www.cdc.gov/media/releases/2020/s0124-marburg-virus.html.
37. Brian R. Amman et al., "Isolation of Angola-like Marburg Virus from Egyptian Rousette Bats from West Africa," Nature Communications 11, (2020): Article 510, https://www.nature.com/articles/s41467-020-14327-8.
38. Brian R. Amman et al., "Isolation of Angola-like Marburg Virus from Egyptian Rousette Bats from West Africa," Nature Communications 11, (2020): Article 510, https://www.nature.com/articles/s41467-020-14327-8.
39. Brian R. Amman et al., "Isolation of Angola-like Marburg Virus from Egyptian Rousette Bats from West Africa," Nature Communications 11, (2020): Article 510, https://www.nature.com/articles/s41467-020-14327-8.
40. Brian R. Amman et al., "Isolation of Angola-like Marburg Virus from Egyptian Rousette Bats from West Africa," Nature Communications 11, (2020): Article 510, https://www.nature.com/articles/s41467-020-14327-8.
41. In neighboring Sierra Leone, this One Health approach leveraged "the human, animal and environmental and emergency health sectors within the Ministries of Health and Sanitation and Agriculture, and Forestry and Food Security, along with other international partners was implemented across national, district, and local community levels." Over a two-week period, documents including Marburg factsheets, preparedness, detection, and response plans were developed and presented at a national conference, resulting in recommendations for public health outreach, with a team comprised of key stakeholders (government health and agricultural units, universities, development partners, and district and local authorities) across the capital city and three of the districts. This outreach team conducted initial information sharing events in each community near the Egyptian rousette bat colonies followed by regular in-person meetings with traditional community leaders and other local stakeholders to provide key messages related to virus exposure risks and methods to reduce contact with bats. Concerns raised by local communities where wild meat consumption brings them in contact with bats for their livelihood were noted and discussed, and local perceptions about bats were explored in developing options for minimizing exposure risks. As an additional national-level public preparedness measure, Marburg Fever has now been included in testing regimens at national laboratories in Sierra Leone. Brian R. Amman et al., "Isolation of Angola-like Marburg Virus from Egyptian Rousette Bats from West Africa," Nature Communications 11, (2020): Article 510, https://www.nature.com/articles/s41467-020-14327-8.
42. "Angola: OIE Donates Rabies Vaccines for Rabies Elimination," World Organisation for Animal Health (founded as OIE), February 12, 2020, *https://rr-africa.woah.org/en/news/angola-oie-donates-rabies-vaccines-for-rabies-elimination/.*
43. "Angola: OIE Donates Rabies Vaccines for Rabies Elimination," World Organisation for Animal Health (founded as OIE), February 12, 2020, *https://rr-africa.woah.org/en/news/angola-oie-donates-rabies-vaccines-for-rabies-elimination/.*
44. Rabies. World Health Organization, African Region. https://www.afro.who.int/health-topics/rabies.

vector for rabies in Angola.[45] [46] Rabies in wildlife is also present, but there is no rabies surveillance of wildlife in Angola.[47]

In 2009, a rabies outbreak in Luanda killed at least 93 children in three months.[48] Due to a shortage of vaccines, doctors were unable to save any children taken to the city's pediatric hospital, though the hospital chief at the time also indicated the children had been brought in too late to save them. The actual number of rabies deaths during this outbreak may have been higher, as over four million people live in crowded conditions in urban slums, and this count was based on a single major hospital. There have been contradictory reports regarding whether the city has acted to vaccinate roaming dogs.[49]

Ebola

An ongoing outbreak of Ebola fever in neighboring DRC has caused more than 2200 victims and is not yet under control.[50] Genomic testing indicates the outbreak is a new spillover from the animal population.[51] Even alongside local attempts to control the border and take precautionary measures via biosecurity and police activity, 2022 field reports indicate that noticeable illegal wild meat hunting and trade is occurring between Congolese and Angolans in Angola, so Ebola is of significant zoonotic concern. In the province of Lunda Norte, Angola shares a 770-km border with the DRC. In 2020 the Lunda Norte government announced increased measures along the border. At that time, the Ebola outbreak had not yet spread to the provinces directly bordering Angola (Kassai, Central, Kassai, and Kwango in the DRC,), but the Lunda Norte governor indicated having sufficient biosecurity material and drugs to prevent contagion, and stated that epidemiological surveillance was being strengthened alongside raising awareness about Ebola, advising citizens along the borders to observe the COVID-19 pandemic prevention measures. Police are reported to have increased activity in border areas to stop passage of Angolan and Congolese citizens.[52]

Mpox

Mpox is not endemic in Angola, though it is across many African countries. The disease is transmitted via direct or indirect contact with blood, body fluids, mucous membranes and possibly even undercooked meat of infected animals. Given Angola's proximity to countries where mpox is endemic and its own practices of hunting, selling, and consuming wild meat, there is reason for concern.

45. Rabies. World Health Organization, African Region. https://www.afro.who.int/health-topics/rabies.
46. Donald G. McNeil Jr., "Rabies Outbreak in Angola, Caused by Roaming Dogs, Kills 93 Children," New York Times, March 16, 2009, *https://www.nytimes.com/2009/03/17/health/17glob.html.*
47. Rabies. World Health Organization, African Region. https://www.afro.who.int/health-topics/rabies.
48. Donald G. McNeil Jr., "Rabies Outbreak in Angola, Caused by Roaming Dogs, Kills 93 Children," New York Times, March 16, 2009, *https://www.nytimes.com/2009/03/17/health/17glob.html.*
49. Donald G. McNeil Jr., "Rabies Outbreak in Angola, Caused by Roaming Dogs, Kills 93 Children," New York Times, March 16, 2009, *https://www.nytimes.com/2009/03/17/health/17glob.html.*
50. Nele Teutloff et al., "Hunting Techniques and Their Harvest as Indicators of Mammal Diversity and Threat in Northern Angola," European Journal of Wildlife Research 67 (2021): 101, https://link.springer.com/article/10.1007/s10344-021-01541-y.
51. "Ebola Virus Disease: Democratic Republic of the Congo," World Health Organization, April 28, 2022, https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON377.
52. "Angola Redoubles Border Surveillance with DRC over Ebola," ReliefWeb, June 5, 2020, https://reliefweb.int/report/angola/angola-redoubles-border-surveillance-drc-over-ebola.

Angola's attention to the virus in the wake of outbreaks in other non-endemic countries is of note because the country's response demonstrates understanding that there is an urgent need for increasing epidemiological surveillance measures and infection control. In Luanda in June 2022, the WHO in partnership with a major hospital held a training session on the virus with health professionals as part of a program designed to reinforce the prevention of hospital infections. The program is being carried out by the National Directorate of Public Health with the support of WHO to educate and increase health professionals' ability to handle possible cases. The training on the mpox virus was a response to a recommendation issued by the Ministry of Health.[53]

African Swine Fever

African swine fever is endemic in Angola among feral swine.[54] [55] [56] While it has not been shown to have caused infection in humans, the virus is nevertheless a major concern, in part due to the production and economic consequences for the swine industry,[57] but also because it may become dangerous for humans,[58] and at least one study identifying ASFV-like sequences in serum and sewage from human patients in the Middle East suggests that human infection may occur.[59]

Among swine, the virus affects all breeds, including domestic pigs, and causes acute hemorrhagic fever with up to 100% mortality. It is transmitted through direct and indirect contact with animals, through uncooked meat, and can persist in the environment in contaminated carcasses, food waste, and vehicles and equipment, making eradication difficult. Ticks are a reservoir.[60] Given its endemicity in Angola, hunting trends that could track the infection from the environment into populated areas, and a commitment to increasing smallholder and larger scale domestic pig production, risk of pathogen spread is significant. According to a recent study,"[p]revention, early detection, prompt reaction, and communication play a crucial role in African swine fever control. Appropriate surveillance capable of early detection of the disease in both domestic and wild animals and the implementation of consolidated contingency plans are currently considered the best means of controlling this disease."[61] Control and eradication measures locally include both active and passive surveillance, epidemiological investigation, pig tracking, eradicating the virus where it has been established, quarantine and biosecurity measures in

53. "WHO Supports Strengthening Monkeypox Prevention," World Health Organization, June 23, 2022, *https://www.afro.who.int/countries/angola/news/who-supports-strengthening-monkeypox-prevention.*
54. World Animal Health Information Department, "African Swine Fever (ASF)," Report No. 47: 2016–2020, World Organisation for Animal Health (OIE), https://www.woah.org/app/uploads/2022/01/asf-situation-report-18062020.pdf.
55. Guberti et al., "African Swine Fever in Wild Boar: Ecology and Biosecurity," FAO Animal Production and Health Manual 22, (2019): FAO, OIE, and EC, *https://www.oie.int/app/uploads/2021/03/en-manual-asfinwildboar-2019-web.pdf.*
56. "23. African Swine Fever I," PigHealth Bytes, accessed August 29, 2023, *http://www.positiveaction.info/emails/PigBytes/PDFs/023_African_Swine_Fever.pdf.*
57. "African Swine Fever: 5 Questions and Answers," Boehringer Ingelheim, accessed August 29, 2023, https://www.boehringer-ingelheim.us/news/news/african-swine-fever-what-you-need-know-5-questions-and-answer.
58. Vladislav Vorotnikov, "ASF Could Become a Human Health Risk," Pig Progress, July 11, 2013, https://www.pigprogress.net/health-nutrition/asf-could-become-a-human-health-risk/.
59. Joy Loh et al., "Detection of Novel Sequences Related to African Swine Fever Virus in Human Serum and Sewage," Journal of Virology 83, no. 24 (December 2009): 13019-25, https://pubmed.ncbi.nlm.nih.gov/19812170/.
60. Maria Luisa Danzetta et al., "African Swine Fever: Lessons to Learn from Past Eradication Experiences. A Systematic Review," Frontiers in Veterinary Science 7 (2020): 296, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7296109/.
61. Maria Luisa Danzetta et al., "African Swine Fever: Lessons to Learn from Past Eradication Experiences. A Systematic Review," Frontiers in Veterinary Science 7 (2020): 296, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7296109/.

domestic pig holdings and animal movement control. Early detection is considered critical and the most complex aspect of surveillance.[62]

New and Emerging Infectious Diseases

Land use changes and climatic changes in Angola may be driving the emergence of novel viruses. Road infrastructure into remote spaces, wild meat hunting and consumption driven by hunger, and the introduction of increasing numbers of cattle, pigs, and poultry into the country can lead to a reduction in the distances between zoonotic pathogens, infected animals, and humans. For example, research in sub-Saharan Africa has emphasized the need to avoid disturbance of bat roosts and dwellings that may precipitate spillover.[63] Angola is challenged by many resource constraints, including a lack of appropriate diagnostics. According to veterinary experts, Angola lacks well-equipped laboratories in which to conduct zoonosis research and diagnoses. But there is a strong possibility that hunting practices and improper handling of livestock and wildlife is enabling anthropozoonosis to evolve into zoonosis. Uíge provincial veterinarian services, for example, indicate that infection rates of brucellosis, tuberculosis and rabies are rising in humans, other primates, and rodents. Capacities for surveillance and early detection of novel viruses are urgently needed. Currently, across Africa, under/misdiagnosis of unfamiliar infections is often accompanied by overdiagnosis of familiar ones.[64]

WILD MEAT

In general, wildlife markets in Angola vary widely, ranging from the largely informal, often temporary or opportunistic roadside sale of wild meat to the well-established meat markets in and around main cities. wild meat, in both the small and large markets along the roads and in the cities, is normally handled in very poor sanitation conditions, in the open, with no form of packaging or cooling measures. The wild meat may be displayed on cloth spread on the ground, in open tubs, on shelves, or hanging on vertical poles. Small scale local sales can also involve women and children holding carcasses in their hands for hours on the roadside. The risk of zoonotic diseases is prominent and obvious.[65] Pathogen spread to humans may occur during handling, processing or consuming the wild meat, and anyone handling animal carcasses in these situations is vulnerable.

62. Maria Luisa Danzetta et al., "African Swine Fever: Lessons to Learn from Past Eradication Experiences. A Systematic Review," Frontiers in Veterinary Science 7 (2020): 296, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7296109/.

63. Alison J. Peel et al., "Continent-wide Panmixia of an African Fruit Bat Facilitates Transmission of Potentially Zoonotic Viruses," Nature Communications 4 (2013): 2770, https://www.nature.com/articles/ncomms3770.

64. Benjamin Mubemba et al., "Current Knowledge of Vector-borne Zoonotic Pathogens in Zambia: a Clarion Call to Scaling-up "One Health" Research in the Wake of Emerging and Re-emerging Infectious Diseases," PLoS Neglected Tropical Diseases 16, no. 2 (2022): e0010193, *https://www.proquest.com/docview/2640118843?parentSessionId=X59YFIz1VAs6dxepN1eajHT8KJZ7LIVokqKO3nvvvq4%3D&pq-origsite=primo&accountid=11311.*

65. Bersacola et al. surveyed small and main roads outside Luanda, as well as the Benfica Market, and observed the following: "We encountered wild meat for sale at 13 locations, of which one was in the Gabela region and 12 to the northeast of Luanda. We observed hunters harvesting one Blue duiker and one Yellow backed duiker. The most numerous species found in the wild meat trade were Blue duikers (45.1%), Blue monkeys (11.3%), Bush hyraxes (9.9%) and Yellow backed duikers (8.5%) from a total of 71 individuals recorded (Table 1). For 25 fresh carcasses, the hunting technique was evident. Eighty four percent of these fresh carcasses were hunted with shotguns, 16% were trapped using metal or string snares. All fresh carcasses were killed the same day they were presented for sale; at none of the sites was there an opportunity to store perishable goods, but whatever was not sold would be dried or smoked and presented for sale again. Some vendors said they hunted the animals themselves."
Elena Bersacola et al., "Hunted in Angola: Surveying the wild meat Trade," January, 2014, SWARA, Jan-March 2014, p. 33. *https://www.eawildlife.org/DigitalSwaraMagazine/EAWLS_Swara_Magazine_01_2014.pdf.*

Species Hunted, Traded, and Consumed

The species sold in the markets and consumed locally vary across the country in accordance with respective ecosystems and species abundance. The economic circumstances in Angola have driven more opportunistic consumption. For example, in Malanje, the consumption of monkeys is a new practice. Traditionally, Malanje people consumed small rodents, antelopes, birds, buffalo, and wild boars. They now also hunt and consume monkeys, snakes, wild dogs, jackals, porcupines, mongooses, civets, and wild cats. In Luanda, turtles are increasingly being targeted, another new practice. In Lobito, Benguela province, children are killing flamingos for consumption. This is a new practice resulting mainly from the degraded economic situation in Angola. Northern Angola has always been primarily known for its consumption of monkeys, while Central and Eastern Angola for deer, jackals, wild boars, and various rodents.[66]

Species hunted are sold living, dead, and smoked. According to one field study, among the most frequently harvested and regularly observed across markets are bats, including but not restricted to Egyptian rousette bats (the source of the Angolan strain of Marburg Fever[67]), hammer-headed bats, Angolan fruit bats, and dwarf epauletted fruit bats. Other species commonly hunted and observed across markets include rodents such as forest and woodland mice, squirrels, cane rats, and porcupine; primates of multiple species such as red-tailed monkeys, talapoin monkeys, and Angolan colobus; blue duiker, yellow-backed duiker, and common and bushback antelope; tree pangolin; river pig; gents; mongoose; shrews; forest buffalo; and forest elephants.[68]

Bats are of particular and urgent concern. At the whole-genome level, SARS-Cov-2 is 96% identical to a bat coronavirus detected in Horseshoe Bat, a species belonging to the family of Rhinolophidae in Angola. These bats are regularly hunted and consumed around the province of Uige. These frequently hunted, commodified bats from Uige are known hosts of zoonotic diseases like Ebola (hammer-headed fruit bat) and Marburg virus (Egyptian rousette). And even when they're not being directly hunted for consumption or sale, their roosts can be disturbed in the hunt for other types of wild meat, and they are often accidentally caught. Fishing rods or barriers and bird nets used for hunting, while not specifically made to catch bats, often catch them accidentally.[69]

Trade and Markets

Travelers to Luanda, famous for its meat markets, sensationalize the "meat table" at big markets like the Congolese Market, where all manner of goods are available for sale and swarming crowds come and go all day in 95-degree heat:

66. Jose Pedro Agonstinho, Antonio Jose Rafael. Independent Research: Angola Animal Markets. ORBIS Angola and Brooks McCormick Jr., Animal Law & Policy Program, Fall and Winter 2019-2020.
67. "Marburg (Marburg Virus Disease)," Centers for Disease Control and Prevention, last reviewed June 9, 2023, https://www.cdc.gov/vhf/marburg/index.html.
68. Nele Teutloff et al., "Hunting Techniques and Their Harvest as Indicators of Mammal Diversity and Threat in Northern Angola," European Journal of Wildlife Research 67 (2021): 101, https://link.springer.com/article/10.1007/s10344-021-01541-y.
69. Nele Teutloff et al., "Hunting Techniques and Their Harvest as Indicators of Mammal Diversity and Threat in Northern Angola," European Journal of Wildlife Research 67 (2021): 101, https://link.springer.com/article/10.1007/s10344-021-01541-y.

> On top of the sheets were piles of clothes, not really organised, just thrown down. Other streets were lined with food stalls (by stall I mean a sheet on the ground and the food on top of the sheet—some had tables). There was one in particular that caught my eye: the meat table. A woman was selling various cuts of meat, all quite large. They looked like they had just been hacked off a cow with an axe! I'm not sure what animal it was but there was one bit of meat with the full tail (with skin and hair) hanging off the end of it. The lady stood over the meat with a piece of paper swatting the flies away…And I couldn't help but think that whatever meat wasn't sold on the day would be added to tomorrow's table.[70]

To ensure good business the following day, market sellers keep a container of blood (separate at the time of the kill) which they gradually pour onto the meat such that the meat appears fresh or recently slaughtered.[71]

A thriving illegal wildlife trade exists in Angola, as does a country-wide illegal wild meat trade. Both cross into tourist and other destination markets. In addition to zoonotic risks, wildlife consumption practices also threaten some endangered species, which can be found for sale in such markets.[72] Until 2016, the Benfica artisanal market in Luanda, the Angolan capital, was the largest open market of ivory and other illegal wildlife products in southern Africa, and one of the two or three largest in Africa.[73] Enforcement efforts led by the Ministry of the Environment and the National Police ended ivory trade at the market by 2016.[74] However, wild meat markets prevail throughout Angola along the main roads and near the main cities, and enforcement is limited and insufficient to curb this illegal trade.[75]

Very few countrywide surveys of wild meat markets have been realized so far, and most existing information has been anecdotal, qualitative, and based on stakeholders' informal interviews rather than research and quantitative data collection.[76] However, these studies, and more recent quantitative research, reveals that the demand for wild meat is widespread throughout Angola, common among both rural and urban communities and present among all classes of society. Wild meat is considered a delicacy and a status symbol at social events.[77] This demand intensified during some four decades of armed conflict until 2002, exacerbated by increased access to Protected Areas and other natural habitats

70. Gordon Murphy, "Luanda's Markets," Medium, February 21, 2015, https://medium.com/@gordonmurphy/luanda-s-markets-b45668f96f90.

71. Jose Pedro Agonstinho, Antonio Jose Rafael. Independent Research: Angola Animal Markets. ORBIS Angola and Brooks McCormick Jr., Animal Law & Policy Program, Fall and Winter 2019-2020.

72. "The African Manatee is another globally vulnerable species that is likely on the verge of extinction in Angola, resulting from unsustainable hunting associated with the wild meat trade (Morais et al. 2006a, b; Collins et al. 2011)." Huntley et al. Biodiversity Conservation: History, Protected Areas, and Hotspots. (2019), 505. https://www.repository.utl.pt/bitstream/10400.5/17771/1/REP-CEABN-Biodiversity-978-3-030-03083-4_18.pdf 415.

73. "Luanda has long provided an open market for the illegal trade in wildlife products (Milliken et al. 2006; Svensson et al. 2014) and was described by Martin and Vigne (2014) as the biggest ivory market in Africa." Huntley et al (2019), 505.

74. "Angola Announces Major Push Against Ivory Trade as It Gears Up for World Environment Day," UN Environment Programme, April 18, 2016, https://www.unep.org/news-and-stories/press-release/angola-announces-major-push-against-ivory-trade-it-gears-world.

75. "A notice by the National Institute for Consumer Protection advises the population to avoid the consumption of game meat marketed in informal markets, since such markets may not maintain proper sanitary practices." Library of Congress Report, 5, and in reference to INADEC Proíbe Consumo de Carne de Caça por Ser Prejudicial a Saúde: *https://perma.cc/4U7T-Z38S*.

76. See e.g., Francisco M. P. Gonçalves et al., "A Rapid Assessment of Hunting and Bush Meat Trade Along the Roadside Between Five Angolan Major Towns," Nature Conservation 37 (2019): 151-160, https://natureconservation.pensoft.net/article/37590/.

77. Angola's case is particularly pronounced as a subsistence practice in the wake of prolonged civil war, but a more general assessment of wild meat practices often notes this social function. See for example the recent coverage of wild meat in Jani Hall, "What is wild meat?" National Geographic, June 19, 2019, *https://www.nationalgeographic.com/animals/article/wild meat-explained.*

combined with insufficient control and enforcement after the war ended.[78]

Importantly, wild meat consumption is increasing in Angola.[79] For income and to meet demand for protein and food, more hunters and more offtake per hunter occurs in many areas, the result of easier access to more remote areas due to improved road conditions across the country. Between 2002 and 2017, the Angolan government constructed or rehabilitated on average 1100 km of road per year. New roads have provided better access to and between remote areas and potential markets across the country. In addition, many hunters have greater access to better equipment and improved methods.[80]

Some hunters attest to witnessing the consequences. For example, in Huambo, local hunters revealed that meat offtake and the availability of wild meat prey have dramatically reduced in recent years as a result of increased hunting and also the increase in the number of hunters. They capture fewer and fewer antelopes and carnivores per hunting session than they used to. Currently, they come across more rodents. This suggests a decline in the wildlife population, allowing an increase of rodents due the absence of their natural predators. Noticeably, in recent years, Congolese nationals have been illegally exporting wild meat through the land border with the Democratic Republic of Congo. In some areas, local hunters say that due to traders' high demand for wild meat, in conjunction with the lack of other income opportunities, they and their families have reverted to consuming only animal parts that are not in demand, selling the higher value, more nutritious parts. They use the meager revenues they receive to purchase essential commodities, such as oil, salt, soap, and medicine.

But the wild meat trade in Angola is not merely a local, subsistence phenomenon. In fact, buyers from Luanda, provincial capitals, and some other larger towns ensure the maintenance of the trade. In Malanje, buyers of wild meat who trade it in the larger cities (such as Luanda or Malanje town) are also the main suppliers for gunpowder cartridges used to kill wildlife. This practice has turned into an unending vicious cycle, with boxes of gunpowder cartridges exchanged for wild meat to harvest more wildlife, which in turn gives more access to greater quantities of cartridges in a progressive manner. In Huambo and Benguela, wild meat traders from the urban areas employ groups of villagers, supplying them with shotguns, gunpowder, cartridges, and mobile telephones to conduct the work for them. The revenue for the sale of wild meat resulting from this activity is shared between the employer and the group of villagers who served as the hunters. There is some level of organization amongst the different players. In most cases, the market for wild meat is not regarded as crime but rather as an acceptable livelihood.[81]

To a certain extent, wild meat is also a substitute for other food items that many Angolans cannot buy any longer due to ever-decreasing purchase power. In the last few years, many Angolan families have resorted to wild meat consumption due to severe fish shortages. For instance, 15 kg of Mackerel scad (one of Angola's most basic food products) costs 35,000.00 AOA (US$54.51). Comparatively, 15

78. See again Gonçalves et al. See also: M. Kubelová, J. Mazancová, and P. Široký, "Theileria, Babesia, and Anaplasma Detected by PCR in Ruminant Herds at Bié Province, Angola," Parasite 19, no. 4 (2012): 417-422, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3671455/. See also: L. S. Petracca et al. "Modeling Community Occupancy from the Line Transect Data: a Case Study with Large Mammals in Post-war Angola," Animal Conservation 23, no. 4, (2020): 420-433. https://zslpublications.onlinelibrary.wiley.com/doi/10.1111/acv.12555.

79. J. S. von Dacre, "Angola, Commercial Cattle Farming Creates Hunger Crisis for Thousands," InsideOver, November 4, 2019, https://www.insideover.com/society/angola-commercial-cattle-farming-creates-hunger-crisis-for-thousands.html.

80. Jose Pedro Agonstinho, Antonio Jose Rafael. Independent Research: Angola Animal Markets. ORBIS Angola and Brooks McCormick Jr., Animal Law & Policy Program, Fall and Winter 2019-2020.

81. Jose Pedro Agonstinho, Antonio Jose Rafael. Independent Research: Angola Animal Markets. ORBIS Angola and Brooks McCormick Jr., Animal Law & Policy Program, Fall and Winter 2019-2020.

kg of wild meat cost up to a maximum of 8,000.00 AOA (US$12.46). In a country where the average monthly income per family is 15,454 AOA (US$24.07), rural residents do not have alternatives other than resorting to wild meat. The choice is obvious.[82] The sale of wild meat is also often driven by economic circumstances. In urban settings, and whenever wild meat is sold to an urban resident, it is exchanged for cash. In the rural setting, wild meat is exchanged for sugar, salt, cooking oil, soap, and other consumer products, as well as with shotguns or gunpowder cartridges that perpetuates the trade.

Stakeholders and Supply Chain

Stakeholders in the wild meat market include the local hunters; middlemen who may be young people with motorcycles; women paid to process and dry large quantities of wild meat, typically in a yard near their home in rural centers or in small urban centers and marginal neighborhoods in big cities; trade networks; small sellers in the markets; and customers, who may be any citizen, both Angolan and foreign nationals. Foreign nationals support the illegal trade of wild meat and other wildlife products by importing and supplying modern shotguns and gunpowder cartridges used in hunting operations. The country-wide trade chain and larger markets are organized, involving syndicates and entities with high status or with high-status connections. However, the identity of entities involved at higher levels of the trade chain have yet to be identified.[83]

Some poachers and middlemen who live in rural villages or in cities nearby engage in poaching, soliciting poaching, and illegal trade as their only or main occupation. These are typically young men that abandon the traditional lifestyle yet have no alternative employment opportunities. Most hunters, however, are typically local community members whose access to other sources of livelihood, income, or education are very limited. In many villages throughout the country, villagers say that every adult and healthy man is involved in hunting for subsistence as well as for small-scale commercial purposes. A local hunter would typically aim to hunt in any hunting session (of one to three nights) one animal for the family consumption and one or two to sell. Most local hunters engage also in other forms of subsistence livelihood, such as household agriculture.[84]

Hunters often refer to hunting as a sacrifice or a hardship, and as a dangerous and unrewarding activity. Most say they would prefer not to hunt if they had a good alternative to sustain their family. Hunters rarely communicate that they would like their children to be hunters. They invariably say that they want their children to receive education and have access to employment. Being a local hunter is not a career choice. Villagers also claim that widespread corruption is a motive for hunting. They insist that, while mineral resources are being used for corruption, there is no fair distribution of the country's income and resources. They feel that the riches of the country are up for grabs, and therefore, they tap into whatever is within their reach, which is often only wildlife.[85]

82. Lars Kamer, "Monthly Income per Person in Angola from March 2018 to February 2019, by Area," Statista, August 1, 2022, *https://www.statista.com/statistics/1134935/monthly-income-per-person-in-angola-by-area/.*

83. Jose Pedro Agonstinho, Antonio Jose Rafael. Independent Research: Angola Animal Markets. ORBIS Angola and Brooks McCormick Jr., Animal Law & Policy Program, Fall and Winter 2019-2020.

84. Jose Pedro Agonstinho, Antonio Jose Rafael. Independent Research: Angola Animal Markets. ORBIS Angola and Brooks McCormick Jr., Animal Law & Policy Program, Fall and Winter 2019-2020.

85. Jose Pedro Agonstinho, Antonio Jose Rafael. Independent Research: Angola Animal Markets. ORBIS Angola and Brooks McCormick Jr., Animal Law & Policy Program, Fall and Winter 2019-2020.

As a result, poaching occurs throughout the country in the open areas and within Protected Areas. It happens wherever wildlife can be found. Poaching is realized mainly with the use of snares, traditional traps, artisanal improvised shotguns, military rifles, and group hunting with dogs. Although trained and equipped park rangers are now deployed in most of the National Parks, their numbers, equipment, funding, and capacity are still insufficient to curb poaching.[86] Despite increased efforts, intelligence and enforcement capacity along the trade chain and in the markets is still limited and insufficient.[87]

Distribution and supply-chain networks vary, depending on the circumstances—some are formalized marketplaces and others are indicative of an informal market for wild meat, built on relationships. Informal exchanges occur both directly and through middlemen. Larger quantities of wild meat in the form of carcasses or dry meat are sold in local markets and in informal markets in the big cities. Vendors and buyers may meet at local markets, as well as at bus and taxi stations. According to local hunters in rural villages throughout the country, networks of traders regularly solicit and buy wild meat in these forms in large markets near the main cities or main roads and junctions. The wild meat is transported from the rural villages to central concentration points mainly by motorbikes, and from there loaded onto trucks.[88] As a norm, the side-of-the-road trader of wild meat sells to incidental buyers. The sale is open and limited to a few carcasses. However, for large quantities and regular supplies, there are prearranged channels for delivering wild meat to regular consumers in the main city centers, distribution hubs, or to local marketplaces. Wild meat arriving in a city or town comes from different locations across the country and is delivered by car, boat, bus, motorcycle, taxi, and truck.[89]

In many cases wild meat is delivered straight to restaurants (subject to pre-arranged orders) or directly to people's homes for family consumption or traded out of individual homes. Reports also exist of employees of large construction, extraction, mining, logging, or other operations soliciting wild meat directly from local hunters.[90]

Whether exchanged through formal or informal channels, it is extremely rare that wild meat is

86. "Angola agreed to hand over management of a national park in the Namib desert to a not-for-profit organization that runs reserves in 11 countries on the continent, as part of a bid to revive its moribund tourism industry." See Pauline Bax, "Angola Signs Deal with African Parks in Bid to Revive Tourism," Bloomberg, January 31, 2020, *https://www.bloomberg.com/news/articles/2020-01-31/angola-signs-deal-with-african-parks-in-bid-to-revive-tourism.*

87. Gonçalves notes, regarding the evolution of regulatory oversight: "Protection of wildlife in Angola was regulated for many years by outdated colonial laws (e.g. Regulamento de Caça, approved by the Diploma Legislativo No. 2873, 11 de Dezembro de 1957), joint legislation between the Ministries of Finance and Agriculture fixed fines for wild animals whose hunting is prohibited in Angola and those whose hunting is permitted only during each hunting season (Decreto Executivo Conjunto No. 201/16, 26 de Abril de 2016). Other recently approved legislation establishes guidelines to ensure the conservation and sustainable use of forests and wildlife and provides a general basis for all activities related to them (Lei de Bases de Florestas e Fauna Selvagem No. 6/17, 24 de Janeiro de 2017)." (152) And as Bersacola et al. note regarding specific hunting regulations and protected species, as well as enforcement data: "In 1999 the Ministry of Agriculture and Rural Development published the Combined Executive Decree No. 37/99 of 27 January 1999. Annex 1 of this document comprises a list of animals that are prohibited from being hunted; these including [sic] giraffes and rhinos as well as all marine turtle and crocodile species. Under Annex 2 animals are listed for which controlled hunting is allowed, including lions, leopards, impalas and porcupines. Whether these laws are enforced by the Angolan authorities is still unclear." (32)

88. Regarding the informal, itinerant economies common to rural Angola, from the 5th 2007-2012 National Report on the Implementation of the Convention on the Biological Diversity (CDB) in Angola: "It is estimated that about 10 million people live in rural areas. This population is in wood, charcoal, bush meat, honey, insects, wild leaves and fruit and fish of inland and coastal waters of their main sources of livelihood and income. Products derived from biodiversity are still the main raw material of construction for most of the rural population." (16) "5th National Report on Biodiversity in Angola 2007–2012," Republic of Angola, March 2014, *https://www.cbd.int/doc/world/ao/ao-nr-05-en.pdf.*

89. Jose Pedro Agonstinho, Antonio Jose Rafael. Independent Research: Angola Animal Markets. ORBIS Angola and Brooks McCormick Jr., Animal Law & Policy Program, Fall and Winter 2019-2020.

90. Certainly, the influx of investment in petroleum exploration attends significant new road work and habitat disruption. There is also some discussion of expatriate food tourism helping to drive at least some of the wild meat trade. Bersacola et al. note, for example, that "[t]he proliferation of new roads into previously remote areas has often been associated with increased hunting," discussing as well the United Nations' Department of Economic and Social Affairs' estimate that "about 87,000 immigrants are currently present in Angola. The majority of these people are Portuguese and Chinese expatriates. The University of Stellenbosch (South Africa) estimated that over 40,000 Chinese immigrants were in Angola in 2007. Most Chinese workers in Angola are employed by Chinese construction companies." This leads Bersacola et al. to propose that "Chinese workers in Angola might therefore be contributing to fueling the demand for wild meat, increasing the wild meat and wildlife trade, as well as the trade in animal products." See Bersacola et al., pp. 35-36.

subject to some form of refrigeration or freezing, at least for the first 16 hours of harvesting, refrigeration usually happens at the point of consumption. Whenever delivery of the wild meat is not expected to be achieved within an acceptable time frame, sellers smoke it to avoid decomposition. The amount of smoked wild meat arriving in the major consumption hubs is greater than the amount of fresh wild meat.[91]

Evolving Hunting Practices

In the past, monkeys were primarily captured in snares, but hunting tactics have been expanded to include shotguns (some imported from Namibia, others manufactured locally). Along a typical drive to Uíge in the north, wild meat traders are likely to be selling monkeys, blue duikers, and live pangolins, all killed by shotguns. Additional hunting methods include ropes, sharp iron-rod traps that pose dangers to humans who inadvertently step on them, locally-made firearms, fire, and water poisoning. Water poisoning is perhaps the most surprising tactic among these. In Huambo, there have been recurring cases of antelopes being poisoned near sources of freshwater. Hunters carefully identify the drinking location for antelopes, block access to the freshwater, and build a small pond nearby that they fill with water contaminated by rat poison. This is done in the evening, so that animal drinking at night can be targeted. In the morning, hunters follow the paths of the targeted animal to try to find it while still alive. In some cases, they find the lifeless animal (having died just a few hours or minutes before they catch it). As soon as the animal is found, hunters process the carcass, and the animal is sold or consumed without regard for the poisoning. There are no reported instances of humans being poisoned to date.[92]

Burning, another method of capturing/hunting wildlife, does have some agricultural function for Angolans. Typically, croplands are burned during the dry season (June-September) each year to get rid of the scrub and clear the land for new crops. This allows farmers to manually plough the land in preparation for the planting season that starts in October. Small game hunting is conducted as part of this burning. But large bush, savannah, and grassland get burned for large game capture. In this practice, fire is set in a way that wildlife is forced to move away from the oncoming fire. Hunters position themselves in a straight line, running hundreds of meters across the field, forming a barrier. As wildlife encroach the human barrier, they are shot. The killing is indiscriminate. Besides gunshot, some wildlife is also killed by the fire. Hunters report that major accidents happen where hunters are killed or seriously injured by friendly fire from other hunters, due to the poor visibility caused by the smoke. Burning for hunting can be devastating to landowners and farmers, too. Vast areas of crops have been destroyed as fires get out of control. Such reports are heard across the country.[93]

Recently, there have been reports of unmanned aerial vehicles (“UAV” or drones, colloquially) used tools to facilitate illegal hunting. UAV are used to scout and track animals, often medium to large-

91. Jose Pedro Agonstinho, Antonio Jose Rafael. Independent Research: Angola Animal Markets. ORBIS Angola and Brooks McCormick Jr., Animal Law & Policy Program, Fall and Winter 2019-2020.

92. Nele Teutloff et al., “Hunting Techniques and Their Harvest as Indicators of Mammal Diversity and Threat in Northern Angola,” European Journal of Wildlife Research 67 (2021): 101, https://link.springer.com/article/10.1007/s10344-021-01541-y.

93. Nele Teutloff et al., “Hunting Techniques and Their Harvest as Indicators of Mammal Diversity and Threat in Northern Angola,” European Journal of Wildlife Research 67 (2021): 101, https://link.springer.com/article/10.1007/s10344-021-01541-y.

sized animals, and particularly those that travel in herds. This practice allows for poachers to follow the precise location of the animals they intended to kill or capture, and suggests a movement towards increasingly sophisticated illegal hunting operations.[94]

Rodents such as grasscutters, rats, mice, rabbits, squirrels, and porcupines are an important food source across Angola and part of the daily diet. In Angola, rodents are hunted mainly by children and women using snares. Hunting happens during the day. Rodents are dug and killed with a hoe or a machete. Invariably, a chase (by dogs) takes place before the kill. And again, in the dry season (June to September), small bushfire hunting is used to scare the hunt out of their hole and expose them. Hunters are unaware of the risk of zoonosis involved in hunting and eating rodents. Children, in particular, are vulnerable to such risks.[95]

PETS AND OTHER WILDLIFE TRADE

Although the Benfica market has officially closed, wildlife trade remains a serious problem in Angola, although enforcement efforts are ramping up to meet the challenge. In the case of rhino horn, Angola is clearly only a transit country, as rhino populations in Angola are extinct and the last reported sighting was during the early 1980s. There are occasional unverified reports on individual rhino presence in south Angola.[96] Since 2015, the enforcement authorities with the Ministry of Environment have verified the presence of illegal wildlife trade syndicates operating in Angola. The ensuing enforcement operations resulted in confiscations of rhino horns, raw and worked ivory, pangolin scales, live apes, and African grey parrots, among other species, and in the arrests of both Angolan and international actors. This has included Vietnamese nationals in Luanda and DRC nationals in Cabinda Province, among others.[97]

Wildlife trade syndicates use Angolan ports and airports for illegal trade. In November 2019, a presentation by the Environmental Investigation Agency (EIA) revealed that recent seizure of wildlife products related to Angola were identified in Vietnam (21%), Namibia (23%), China (18%), Cambodia (10%), France (5%), Kenya (5%), Thailand (8%), and other countries (10%).[98] During the Angolan civil war, hippopotamuses used to be hunted by the military. Soldiers targeted hippos to extract their fat, which was used as an oil substitute for greasing firearms, as well as for fueling oil lamps. This practice ended as Angola achieved peace in 2002, but there are now emerging reports of the demand for hippos having re-emerged with speculation that Asian-market traders buy the hippo fat. The Angolan wildlife market remains a dynamic challenge.

Robust pet markets also exist in Angola, including markets that are served by poaching and that serve illegal wildlife supply chains. Live apes, guenons and other monkeys, small antelopes, African grey

94. Personal interview with Paulo Armindo, Gonga Bandi, Malanje Resident, August 12, 2021.

95. Nele Teutloff et al., "Hunting Techniques and Their Harvest as Indicators of Mammal Diversity and Threat in Northern Angola," European Journal of Wildlife Research 67 (2021): 101, https://link.springer.com/article/10.1007/s10344-021-01541-y.

96. "[T]he illegal trade in wildlife products (ivory, rhino horn and teak) became significant during the war as the leaders of UNITA (União Nacional para a Independência Total de Angola) sought funds to purchase arms (Breytenbach 2015)." Huntley et al. Biodiversity Conservation: History, Protected Areas, and Hotspots. (2019), 505. https://www.repository.utl.pt/bitstream/10400.5/17771/1/REP-CEABN-Biodiversity-978-3-030-03083-4_18.pdf

97. "Despite the recent Ebola outbreak in the neighboring country of Democratic Republic of Congo (DRC), individual animals appear to be obtained directly from hunters and slaughtered without any sanitary measure or observing a quarantine period. This observation is particularly concerning as Uíge province shares an extensive terrestrial border with DRC and the consumption of wildlife in Africa is frequently associated with increased risk of acquiring zoonotic diseases (Ordaz-Nemeth et al. 2017)." Francisco M. P. Gonçalves et al., "A Rapid Assessment of Hunting and Bushmeat Trade Along the Roadside Between Five Angolan Major Towns," Nature Conservation 37 (2019): 153, *https://natureconservation.pensoft.net/article/37590/.*

98. Introduction to Wildlife Crime or Prosecutors Workshop, October 8, 2019. PowerPoint presentation, Cabo Ledo, Luanda, Angola.

parrots and some other birds, and various reptiles, are the main species that were found in the illegal pet trade.[99] African grey parrots and infant chimpanzees are trafficked mainly for cross-border illegal wildlife trade, but there are reportedly around 20 chimpanzees kept in Angola, normally in appalling conditions, and an unknown number of parrots.[100] The authorities are making an effort to confiscate illegally kept apes and transfer them to sanctuaries in neighboring countries, and the Government wishes to establish a chimpanzee sanctuary within Angola. The confiscation of illegally caught parrots was initiated in recent years. A release aviary was constructed and the rehabilitation and the release of the first nine individuals occurred in 2019, by the Maiombe National Park staff in Cabinda Province, and was enabled with the training and help of the World Parrot Trust, Wildlife Impact, and USFWS.

LIVESTOCK

Animals raised as livestock in Angola primarily include cattle, pigs, goats and poultry. According to the most recent meat animal production statistics of the Food and Agriculture Organization of the United Nations, Angola in 2019 imported: 621,200 cattle, 1,365,433 goats, 2,094,056 pigs, 298,939 sheep, and 54,483,000 chickens.[101]

Angola's primarily pastoralist human–animal relationship in the livestock sector matches general African trends. Broadly, this suggests common practices such as smaller holdings and less high-volume processing risks but with potentially diverse species populations and intensive human–animal contact. Recent analysis of African pastoralist practices and zoonotic risks suggest that this "lead[s] to a diversity of zoonotic infectious diseases'' and that "[p]astoral communities are at a high risk" due to "their livestock management practices, which include herd mixing and transhumance and the locations they occupy—especially their contact with wildlife—as well as the consumption of wild meat among some pastoral communities."[102] Angola's pastoralists have traditionally had a multi-faceted relationship with livestock, such as the Humbe cattle indigenous to the southern part of Angola, which shows indications of imported breed mixing. Among the purposes these animals serve, besides meat and dairy products, are labor purposes and "social prestige in rural areas."[103]

Angola's rural populations, traditionally, have been defined as small-scale agriculturists. Current estimates by the IFAD suggest that "[t]wo thirds of the population depends on agriculture for food, income and employment, with women providing most of the labour force. An estimated 80 per cent of farmers

99. Beth Hahn prepared an extensive 2013 USDA Forest Service Report, "Angola Biodiversity and Tropical Forests: 118/119 Assessment," noting: "Although unlicensed wild meat trade is illegal in Angola, wild meat is readily available in much of the country and can be bought openly along roadsides. (...) Direct threats to biodiversity include commercial hunting, subsistence poaching and the illegal pet trade (e.g., grey parrot)," (32, 37), *https://usaidgems.org/Documents/FAA&Regs/FAA118119/Angola2013.pdf.* Gonçalves et al. note that, along the major trade road between the provinces of Bengo and Uíge, there are multiple species sold roadside and in informal village sale points. This includes antelopes, monkeys, snakes, and a globally protected species of pangolin (Manis tricuspis). Wading birds and parrots are often sold in pet shops and roadside at Kifangondo, the entry point to Luanda when coming from the north. At fairs and entry points to the main cities, these can be found offered by young boys. The report did not track specific evidence of cross-border trade but did note that "there may be trade of wildlife meat in the informal markets of the principal border posts, due to the intense and unregulated commercial activities between the two countries," (pp. 153–4).

100. Huntley et al. (2019) note that "chimpanzees are likely targeted for the commercial wild meat trade (Ron and Golan 2010), but the scale of this trade is poorly known. Huntley (2017) records that gorilla and chimpanzee were by tradition not included among wild meat species in Cabinda in 1973, while Bersacola et al. (2014) reports on chimpanzees occurring in the pet trade in Angola that were believed to originate from Cabinda. Future studies to assess the distribution and population status of the two great apes in Cabinda, including in- depth investigation on the human-great ape interactions in this region should be considered a priority," (p. 401).

101. Data is for 2019. Retrieved from the FAOSTAT database: *http://www.fao.org/faostat/en/#data/QL*, accessed September 2, 2023.

102. Anthony Egeru, Sintayehu W. Dejene, and Aggrey Siya, "Short Report on Implications of Covid-19 and Emerging Zoonotic Infectious Diseases for Pastoralists and Africa," Pastoralism: Research, Policy and Practice 10, no. 1 (2020):12, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7281698/.

103. "Humbe Cattle: Art of Taste," Slow Food Foundation for Biodiversity, accessed September 2, 2023,https://www.fondazioneslowfood.com/en/ark-of-taste-slow-food/humbe-cattle/.

are smallholders. Their productivity is low and they generally produce little or no surplus."[104] In the south especially, those who have remained in rural communities throughout Angola through the course of the civil war and the post-war period continue existing traditions of livestock husbandry, mainly cattle, goats, and sheep.[105] There are also many communities almost everywhere in the country that raise small-scale livestock for household consumption, mainly goats, sheep, pigs, and poultry. Dogs are kept for protection, herding, and hunting, and some communities, mainly in the south again, also keep donkeys for transporting.[106] In Luanda, there are increasingly more reports of young people eating domestic cats, often encouraged by their peers who claim that cats taste the same as rabbits.

Angolan government strategy for the agricultural sector aims to foster an increase in productivity by promoting the sustainable transformation of subsistence production and the progressive increase of market-oriented production, with a view to achieving food security and fighting hunger and poverty, as well as boosting national agroindustry. Currently in the wake of the civil war, Angola imports more than half of its food, and its livestock market is generally characterized as subsistence production "based on natural pasture grazing."[107] Angola is not considered a livestock export country, but development of the agricultural sector is ongoing.

Currently, Angola's livestock production can best be characterized as an in-development intersection of these traditionally informal, non-industrialized smallholder subsistence modes and emerging, often imposed commercial modes that suggest a turn to larger scales and greater traffic, which has of late made Angola a major interest for international investment and development toward further industrialized systems.

Given the nature of small-scale farming in Angola, the market practices of Angola are fairly unique relative to many other nations that have more pronounced livestock market traffic and active rural sale points. Recent analysis of retail and commercial potential in Angola by the U.S. Department of Commerce International Trade Administration (ITA) makes it clear that meat sales in major cities such as Luanda have been more forcefully regulated to control food quality concerns in recent years. This has included shutting down some of the existing informal spaces as more formal, brand-oriented retail outlets in the urban areas like Luanda take precedence for the populations that have also concentrated dramatically in these urban areas in the wake of the civil war.[108] The ITA also suggests that, although urban Angolan consumers still feel comfortable in informal, open air markets and may prefer such smaller, local options, given the dearth of automobile access or transport infrastructure, "[c]onsumers across income levels are becoming more sophisticated and demanding in terms of variety and quality. In

104. "Angola," International Fund for Agricultural Development, accessed September 2, 2023, https://www.ifad.org/en/web/operations/w/country/angola.

105. Regarding goats: Startup delivery companies created an app for delivering live goats to your door in Angola. See "Angola's Go-to App for Delivering Live Goats to Your Door," The Economist, December 6, 2018, https://www.economist.com/middle-east-and-africa/2018/12/06/angolas-go-to-app-for-delivering-live-goats-to-your-door.

106. Article 10 of Angola's Animal Health Law, regarding the restriction of movement of canine species, states: "Access to canine animals is forbidden in fairs, markets, retention parks, slaughterhouses or other places where cattle are concentrated to avoid the transmission of various infections or infestations." "Lei da Sanidade Animal," Ministério da Agricultura, accessed September 2, 2023, *http://www.saflii.org.za/ao/legis/num_act/ldsa123.pdf.*

107. 2020 U.S. Department of Commerce International Trade Administration U.S. Country Commercial Guides report on Angola (2020 USDC ITA Angola Report), p. 25. Regarding Angola's limited livestock export economy, see for example: https://www.cia.gov/the-world-factbook/countries/angola/#economy.

108. For example, in the 2020 USDC ITA Angola Report, "[t]he government is trying to formalize retail by establishing specific areas for open markets. In Luanda, municipal authorities are forcefully shutting down street vendors with laws that impose fines for both vendors and buyers. Public health concerns are the main reason cited for the closures of informal open markets, as goods are often sold in poor condition, food is kept on the ground, without refrigeration and exposed to the sun, and expired goods are sometimes offered for sale," p. 22.

the past, Angolans were satisfied with small grocers selling dry goods, but now retailers are expected to offer frozen goods as well."[109]

It is difficult to ascertain the precise traffic and market sites of the informal livestock trade in rural areas, but open-air sales occur near all main cities in multi-product markets with meat, electronics, canned food, and any number of other items. Economic factors directly contribute to zoonotic risks in the Angolan informal livestock market. Raising live animals is an expensive activity due to feed costs (1 USD per Kg of compound feed). This is aggravated by the high cost of production, chronic electricity and water supply problems, and dependency on generators. Livestock meat processing is conducted in the informal market under extremely poor sanitary conditions. This poses a severe threat of zoonoses across Angola because animal waste such as blood, bones, intestinal content, tissues, and skin are scattered in large piles around marketplaces. Dogs and other animals feed on this animal waste. Some of these same dogs are also used for hunting.

Slaughter and Abattoirs

In 2014, The Ministry of Agriculture and Forestry launched a project to rehabilitate four regional abattoirs. The overall investment was estimated at US$15 million. By 2018, two abattoirs had been completed: one in Huila (US $2 million) and another in Camabatela (US$13 million). But at present, both abattoirs have been shut down due to a lack of livestock. Now, abattoirs are part of the privatization plans of the Angolan government; however, selling of livestock products in small and convenient formats or in the street remains the norm and accounts for 80% of retail sales.

Angolan government agencies are actively monitoring livestock holdings and production as part of a World Bank-funded, UN FAO-supported pilot national census.[110] Currently under development with the Angolan Government is a major World Bank "Commercial Agriculture Development Project," estimated at US$230 million in 2018. The project is expected to continue until May 2024. The proposed project's development objectives are to promote commercial agriculture development and specifically to increase production and employment within selected value chains in targeted areas in Angola.

As noted, general investment opportunities in Angola have recently received attention within international finance communities. The World Bank/International Finance Corporation, for example, recently published an advisory report on investment in Angola that paid extensive attention to agricultural development.[111] And, according to policy papers authored in collaboration with the Johns Hopkins China Africa Research Initiative, Chinese investment beyond oil production has also focused on developing Angola's agricultural output both for self-sufficiency and for potential export profit.[112] What is generally agreed upon is that Angola's agricultural industry lags behind more rapidly developing industries such as oil. Food security and animal health are primary targets of development programs such as the FAO's Strengthening of Livestock Services in Angola (SANGA) project. A tandem effort of the EU and Angola's

109. 2020 USDC ITA Angola Report, p. 23.

110. 2020 USDC ITA Angola Report, p. 25. The project had been delayed as a result of COVID-19.

111. See, for example, "Creating Markets in Angola: Opportunities for Development Through the Private Sector," International Finance Corporation, World Bank, 2019, https://www.ifc.org/content/dam/ifc/doc/mgrt/201905-cpsd-angola-english-v2.pdf.

112. Zhou Jinyan, "Neither "Friendship Farm" Nor "Land Grab": Chinese Agricultural Engagement in Angola, SAIS China-Africa Research Initiative at Johns Hopkins University Policy Brief No. 07, 2015, *https://static1.squarespace.com/static/5652847de4b033f56d2bdc29/t/568c478fa2bab8d5752045b1/1452033935723/CARI_PolicyBrief_7_Mar2015.pdf.* ee also: *http://www.sais-cari.org.*

Institute of Veterinary Services, SANGA "is looking to narrow that gap regarding livestock services delivery, by addressing animal production and health issues […] utilizing [FAO] experience from other countries to develop a new unprecedented animal health system for Angola, built on a private-public partnership" between the IVS and Animal Health Auxiliaries (private).[113]

There is a critical need for significant change to regulate, monitor, enforce and track livestock and animal husbandry in the coming decade in Angola as it strives to develop across multiple economic fronts. What is especially clear about the Angolan livestock case, as pertains to zoonotic disease risks more broadly, is that it is a significant development increase target across several major industrial and land renovation vectors linked to past outbreaks globally. Whether classified as Indigenous food security and self-sufficiency or supporting international investment exploitations both in and conveniently adjacent to agricultural development, the coming input of the global industrial food system methods and products establish Angola as an emergent agricultural economy with all the attendant, well-known biosecurity threats thrust upon animal markets due to such economic exigencies.

Cattle

Angola also imports 100,000 tons of beef, annually, and the Angolan government has announced a program to offset some of the imports. Beef is noted as the primary agricultural product of Angola, after cassava.[114] Angola does import some live cattle from neighboring countries such as Namibia, where drought conditions have led in the past year to some haste in transporting cattle to slaughter before feed and water shortages result in the death of cattle. This could potentially increase the likelihood of improper or unhygienic traffic, due to economic exigency, and there has been some discussion of increased zoonotic disease management in border security such as more fencing and quarantine zones between the nations. By local estimates, Angola received 2% (521 animals) of Namibia's export under these conditions, alongside COVID-19, in the early 2021 economic quarter.[115]

The program includes a focus on veterinary health, increasing herd production, strengthening slaughterhouse regulations, and building infrastructure capacity through government projects in order to credit private entities.[116]

Private sector investment and involvement in cattle production is increasing. Agro-industrial companies involve Portuguese, Brazilian, and Israeli investors in both independent and joint ventures with the Angolan government. China's role in Angolan agriculture is likewise growing and is backed by

113. "Veterinary Help for Livestock Herders Brings Relief to Angola, Food and Agriculture Organization of the United Nations, accessed September 2, 2023, http://www.fao.org/in-action/veterinary-help-for-livestock-herders-brings-relief-to-angola/en/.

114. 2020 USDC ITA Angola Report, p. 25. Does not include fish under this production category.

115. This information is derived primarily from local news coverage, such as The Namibian, and the Meat Board of Namibia (MBN) is also tracking livestock trends that could potentially—however slightly relative to Namibia's other trends such as export to South Africa (98%) and domestic consumption of meat at the famous kapana stalls—extend to the Angolan context via cross-border traffic. See, for example, "1,4 Million Cattle Sold During Drought… Restocking Hinders Supply of Beef to Markets," The Namibian, May 31, 2021, https://www.namibian.com.na/14-million-cattle-sold-during-drought-restocking-hinders-supply-of-beef-to-markets/.See also the MBN website: *https://www.nammic.com.na/index.php*.

116. "Angola: Agricultural Equipment," International Trade Administration, last updated August 5, 2022, *https://www.trade.gov/knowledge-product/angola-agricultural-equipment*.

financing from the Chinese government. Livestock production equipment and technologies have been identified as the top subsector for investor opportunity.[117]

The Angolan government is engaging with development banks to provide private sector loans including for livestock/cattle, and these projects include funding for commercial/industrial and smallholder operations. Related project loans include funding for infrastructure to connect markets across the Democratic Republic of the Congo, Zambia and Angola.[118]

In 2022, the World Bank approved a US$300 million "Smallholder Agricultural Transformation Project (PROTAF)" to aid Angola's efforts to transition subsistence farmers toward more climate-resistant farming that aims to increase production, increasing food security and reducing dependence on imported food.[119]

Efforts to support commercial and industrial livestock production have not all gone over well among Angolans raising cattle. According to a report by Amnesty International, "tens of thousands" of pastoral farmers have been moved off their grazing land for commercial cattle ranchers, including 46 commercial farms that have been given two-thirds of the "best grazing" land in Angola since 2002[120] without due process.[121] The Amnesty report claims that traditional cattle farmers are being pushed off their land to make room for commercial cattle ranches, creating a hunger crisis for smallholder families raising livestock.[122] In 2002, the Angolan government diverted 67% of grazing land for commercial use, leaving 33% for traditional pastoralists.

Poultry

The Angolan government is significantly investing in poultry production as part of its aim to diversify the economy and reduce dependence on oil.[123] [124] This investment comes despite challenges including lack of animal feed, lack of veterinary medicine and lack of infrastructure.[125] Production is mainly concentrated on backyard chickens and a few commercial farms.[126] In 2020, 404 family producers of chicken declared 4610 chickens, or 11 chickens per household. 160 commercial producers

117. "Angola: Agricultural Equipment," International Trade Administration, last updated August 5, 2022, *https://www.trade.gov/knowledge-product/angola-agricultural-equipment.*

118. "Angola: Agricultural Equipment," International Trade Administration, last updated August 5, 2022, *https://www.trade.gov/knowledge-product/angola-agricultural-equipment.*

119. Izabela Leao, "Angola's Agricultural Sector Could Become Africa's Powerhouse. Here's Why," World Economic Forum, September 13, 2022, https://www.weforum.org/agenda/2022/09/angola-agricultural-sector-powerhouse-of-africa/.

120. "Angola: Drought and Commercial Cattle Farming Exposes Tens of Thousands to Devastating Hunger," Amnesty International, October 15, 2019, *https://www.amnesty.org/en/latest/press-release/2019/10/angola-drought-and-commercial-cattle-farming-exposes-tens-of-thousands-to-devastating-hunger/#:~:text=Tens%20of%20thousands%20of%20pastoral,published%20by%20Amnesty%20International%20today*.

121. "Angola: Drought and Commercial Cattle Farming Exposes Tens of Thousands to Devastating Hunger," Amnesty International, October 15, 2019, *https://www.amnesty.org/en/latest/press-release/2019/10/angola-drought-and-commercial-cattle-farming-exposes-tens-of-thousands-to-devastating-hunger/#:~:text=Tens%20of%20thousands%20of%20pastoral,published%20by%20Amnesty%20International%20today*.

122. J. S. von Dacre, "Angola, Commercial Cattle Farming Creates Hunger Crisis for Thousands," InsideOver, November 4, 2019, *https://www.insideover.com/society/angola-commercial-cattle-farming-creates-hunger-crisis-for-thousands.html.*

123. Natalie Kinsley, "Angola Remains Reliant on Poultry Imports," Poultry World, November 12, 2021, *https://www.poultryworld.net/home/angola-remains-reliant-on-poultry-imports/.*

124. "Angola's Poultry Production Expected to Rise by 17% in 2023 on Improved Economic Environment," Food Business Africa, October 7, 2022, *https://www.foodbusinessafrica.com/angolas-poultry-production-expected-to-rise-by-17-in-2023-on-improved-economic-environment/.*

125. "Angola's Poultry Production Expected to Rise by 17% in 2023 on Improved Economic Environment," Food Business Africa, October 7, 2022, *https://www.foodbusinessafrica.com/angolas-poultry-production-expected-to-rise-by-17-in-2023-on-improved-economic-environment/.*

126. Natalie Kinsley, "Angola Remains Reliant on Poultry Imports," Poultry World, November 12, 2021, *https://www.poultryworld.net/home/angola-remains-reliant-on-poultry-imports/.*

reported 121,821 chickens, an average of 761 chickens per producer.[127] Most of Angola's poultry supply comes frozen from the United States. Within the country, supply comes from laying hens who are slaughtered after 80 weeks.[128]

As an example or glimpse of poultry production in the years ahead, the Kikuxi layer farm advertises itself as a successful model for the future of poultry and egg production in Angola. The vertically integrated poultry processing plant includes eight layer houses that hold 1,050,000 birds and two pullet houses containing 372,000 birds. The poultry processing plant advertises that it is "fully automatic and operates at a high level of biosecurity." The plant has the capacity to slaughter 2500 chickens an hour, or 100 tons of chicken meat each month.[129]

Pigs

Angola's Ministry of Agriculture and Forestry has stated the country currently has around 2,996,289 pigs, and that annual pig production is about 26,000 tons per year.[130]

The Angolan government has launched an initiative to restore regional self-sufficiency in pork production. The initiative distributed pigs across 500 families in 10 municipalities in an aim to improve local farming and reduce dependence on imports. In Luanda-Norte, 150 pigs were distributed across 40 breeding cooperatives and pig-farming training was included. The government also distributed 14 motorcycles to the provincial department of the Institute of Agrarian Development to ensure technical assistance would be available to local producers.[131]

The Portuguese Federation of Associations of pig farmers is also offering training to Angolan pig farmers. In a first provincial forum on pig farming in the Angolan province of Benguela, it was stated that Angola has all the conditions needed to raise pigs, but that it needs grain production and centers for artificial insemination to make small producers competitive.[132]

REGULATIONS & RECOMMENDATIONS

Wildlife supply chains operate both fully within Angola and across Angola's borders, serving demand for wild meat, exotic pets, and high-value wildlife specimens. As it currently stands, Angola's legislation reflects a patchwork approach to regulation of these supply chains, particularly with respect to the sourcing of animals. However, as opportunities arise, legislative reforms continue to build out the regulatory and enforcement framework to match the scale of live animal handling and trade that occurs

127. Natalie Kinsley, "Angola Remains Reliant on Poultry Imports," Poultry World, November 12, 2021, *https://www.poultryworld.net/home/angola-remains-reliant-on-poultry-imports/.*

128. Natalie Kinsley, "Angola Relies on Poultry Imports as Demand Increases," Poultry World, November 1, 2022, *https://www.poultryworld.net/the-industrymarkets/market-trends-analysis-the-industrymarkets-2/angola-relies-on-poultry-imports-as-demand-increases/#:~:text=Angola%20relies%20on%20non%2DGM%20imports%20of%20poultry%20feed&text=The%20country's%20grain%20and%20oilseed,of%20some%20crops%20in%202021*.

129. "Angola's Kikuxi Farm Can Serve as a Model for Large African Poultry Projects," Agrotop, August 10, 2021, https://agrotop.co.il/angola-kikuxi-farm-can-serve-as-a-model-for-large-african-poultry-projects/.

130. LUSA, "Portuguese Pig Farmers Available to Train Angolan Pig Producers," Macau News Agency, October 15, 2018, "*https://www.macaubusiness.com/angola-portuguese-pig-farmers-available-to-train-angolan-pig-producers/.*

131. "Angola Initiates Livestock Promotion Program to Restore Self-sustainability in Pork Production," Food Business Africa, January 31, 2023, *https://www.foodbusinessafrica.com/angola-initiates-livestock-promotion-program-to-restore-self-sustainability-in-pork-production/.*

132. LUSA, "Portuguese Pig Farmers Available to Train Angolan Pig Producers," Macau News Agency, October 15, 2018, *https://www.macaubusiness.com/angola-portuguese-pig-farmers-available-to-train-angolan-pig-producers/.*

in Angola and recognize that these supply chains serve subsistence needs, luxury markets, and foreign consumption habits.

A holistic approach that would identify all key drivers and address all aspects and all links of the wildlife crime trade chain was developed for the Ministry of Environment of Angola in 2011, based on a multi-sectoral approach as well as on regional and international collaboration. A comprehensive awareness campaign is needed that aims to reduce the demand for wildlife crime products. Criminal aspects of wildlife crime must also be addressed through adequate legislation, deterrent penalization, and sufficient enforcement. Angola combined agricultural and forestry oversight under one Ministry, and as of April 2020 this now also includes fisheries regulation.[133]

Hunting

Hunting for wild animal markets and human consumption occurs across Angola, in both protected areas and outside of such areas, and hunting includes species that are common in Angola, as well as those that are highly protected species. The legislation relevant to hunting in Angola has been developed to reflect these variables—namely, where the hunting takes place and whether the species hunted is specially protected.

In 2006, in an effort to reverse wildlife population declines, a joint executive decree placed a 10-year hunting and logging moratorium throughout Angola. Commercially valuable fish and timber species as well as fur seals (*Arctocephalus pusillus*) were exempt from the moratorium. Fur seals, although protected under Angolan law, are considered to be overabundant (estimated by the Ministry of Fisheries and Seas to have a population between 50,000 and 60,000 individuals) and deemed commercially valuable, justifying an (annual?) export quota of 400 fur seals for export. The moratorium did not make an exception for subsistence harvest or hunting, but enforcement discretion was exercised such that communities relying on subsistence wild meat were not targeted. Since the expiration of the moratorium, hunting in protected areas is now regulated by a newly adopted law, the Law of Conservation Areas.[134] In general, the law prohibits commercial hunting in protected areas but carves out exceptions for pre-existing local communities and certain types of protected areas. The law considers a minimum of five different types of protected areas, including (1) Natural Reserves, (2) National Parks, (3) National Monuments, (4) Sites for the Management of Habitat or Species, and (5) Protected Landscapes.[135] Of the five types of protected areas, Natural Reserves, National Parks, and Natural Monuments are subject to explicit prohibitions or restrictions on hunting.[136]

The diversity of conservation areas could complicate enforcement efforts if designations are not coupled with strong public awareness campaigns. For example, even among what constitutes a Natural Reserve, a range of hunting rules apply. Natural Reserves may be wholly protected, partially protected, or specially protected. Within wholly protected Natural Reserves, only permit hunting for scientific

133. Jose Pedro Agonstinho, Antonio Jose Rafael. Independent Research: Angola Animal Markets. ORBIS Angola and Brooks McCormick Jr., Animal Law & Policy Program, Fall and Winter 2019-2020.

134. Law No. 8/20 of 16 April 2020 (Law of Conservation Areas).

135. Law No. 8/20 of 16 April 2020 (Law of Conservation Areas)at art. 10.

136. Law No. 8/20 of 16 April 2020 (Law of Conservation Areas)at art. 13-15.

purposes is allowed; subsistence hunting is prohibited.[137] However, both scientific and subsistence hunting is allowed, so long as it is authorized in advance in partially protected and specially protected reserves.[138]

Outside of protected areas, the Law on Wildlife and Forestry regulates hunting. This law establishes a regulatory regime for subsistence and non-subsistence hunting.[139] When hunting for non-subsistence purposes, only certain species may be hunted, during certain seasons, and upon payment of a fee. These species are identified in a Joint Executive Decree and include several antelope species and various other mammal species, several reptile species, and several bird species, including the highly valuable and endangered African grey parrot (*Psitticus erithacus*).[140] The same Joint Executive Decree identifies species that may not be hunted, including most large mammals found in Angola and several bird species, as well as tortoises and crocodiles. While this regulation is important in that it identifies with specificity which animals warrant strict protections in Angola, it only applies outside of protected areas. Ironically, this means that certain species enjoy greater protection outside of certain protected areas.

Subsistence hunting outside of protected areas falls into two categories. First, noncommercial subsistence rights exist when the wildlife is used for personal or family consumption.[141] Commercialization of any animal product obtained through exercise of this right is strictly prohibited, and subsistence hunting is limited to "small game."[142] Second, communal subsistence rights exist when in accordance with the customs of certain rural communities. The exercise of these communal rights includes the harvest of animal products for food, medicines, and other cultural purposes.[143] No clear prohibition as to commercialization exists.

Layered on top of these two regulatory regimes are additional hunting restrictions based on the conservation status of the species. For example, according to Executive Decree 469/15 of July 13, 2015, all species listed on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) are prohibited for hunting, regardless of whether they are found in a protected area or outside of a protected area.[144]

Despite these provisions, uncontrolled and unrestricted hunting occurs under the guise of "subsistence" hunting. Although much wild meat is consumed as a subsistence source of protein, subsistence hunting has also become a cover for illegal hunting. Because hunting and wildlife protection laws are not well disseminated and enforced through all layers of the government and state administrative chain, enforcement is challenging. Additionally, excessive bureaucracy at the national level disrupts actions at provincial and municipal levels. For example, stealth fishing activity resulted in the capture of more than 1,000 swordfish and marlins in one week at "Praia Bebé" beach in the municipality of Catumbela, 24 km north of Benguela. The local authorities had to wait for a week for a delegation to

137. Law No. 8/20 of 16 April 2020 (Law of Conservation Areas)at art. 13(5).

138. Law No. 8/20 of 16 April 2020 (Law of Conservation Areas)at art. 13(11), (12).

139. Law No. 6/17 of 24 January 2017 (Forest and Wildlife Basic Legislation).

140. Joint Executive Decree No. 201/16 of 26 April 2016 (approving the taxes to be paid for issuing hunting licenses).

141. Law No. 6/17 of 24 January 2017, art. 65.

142. Law No. 6/17 of 24 January 2017at art. 98.

143. Law No. 6/17 of 24 January 2017at art. 66.

144. Executive Decree 469/15 of July 13, 2015 (prohibiting hunting activity and logging within the country of all protected species of wild fauna and flora).

arrive from Luanda before anything could be done, despite multiple denunciations. In some cases, the cover of subsistence hunting is used to supply wildlife to foreigners. In Lobito, local fishermen never used to catch billfish because of the sheer size and strength of the fish, which often resulted in losses of equipment. However, special nets and fishing instructions were given to the local fisherman by Chinese nationals in order to provide a supply of the coveted fish. Also in Lobito, locals sell seahorses to Vietnamese nationals. The conflict between economic expediency and legal enforcement is clear in such cases.

As already noted, when it comes to wild meat trade and consumption, slaughter and processing occurs in informal, unregulated settings. The new Penal Code in Angola contains provisions that address "clandestine slaughter."[145] Clandestine animal slaughter is outlawed if it "takes place without the appropriate sanitary inspection, takes place outside of slaughterhouses or places licensed for that purpose, and the meat is not normally used for human consumption in the country."[146] The penal code does not further clarify what constitutes meat "not normally used for human consumption," so it is unclear whether this would cover any and all wild meat trade, given that wild meat consumption is relatively commonplace. However, a further provision indicates that meat derived from animals subject to a hunting activity and then slaughtered without a sanitary inspection would be considered "clandestine slaughter" and outlawed.[147]

These provisions in the Penal Code indicate a real concern for the safety of stakeholders along animal product supply chains, from individuals involved in the processing of meat to the consumers of such meat. From a public health perspective, if enforced, these provisions are potentially invaluable—reducing informal, unregulated contact between people and animals for gray and black markets is crucial. That said, the activities of the women and children described in this report (selling wild meat on the roadside for hours, hunting with snares, drying large quantities of wild meat) are likely criminal activities, yet given the crush of poverty and lack of incentive or opportunity otherwise, it is clear that these people are acting out of desperate need to both earn a living and feed both their families and other families by supplying necessary protein. Education, public awareness, and some enforcement and prosecutorial discretion is necessary for the most effective use of these provisions.

The Wildlife Marketplace

The commercialization of wildlife harvested or hunted for subsistence purposes is prohibited by both the Law of Wildlife and Forestry (outside of protected areas) and the Law of Conservation Areas (inside protected areas). In addition to the prohibition of commercial use of wildlife taken for subsistence purposes, outside of protected areas, as noted above, certain species may be hunted or harvested for commercial use, but others may not. Given this regulatory regime, very few wild-sourced animals are permitted entry to a legal marketplace in Angola.

When wildlife does enter the marketplace illegally, the newly revised Penal Code applies. In a new provision, it is now a criminally punishable offense to "acquire, dispose of, transport, or otherwise

145. Republic of Angola, Law No. 179, November 11, 2020 (Official Organ of the Republic of Angola).

146. Republic of Angola, Law No. 179, November 11, 2020 at art. 445(3)(a)-(c).

147. Republic of Angola, Law No. 179, November 11, 2020 at art. 447(c).

retain legally protected species of fauna or flora" when these activities are prohibited in law.[148] These same offenses may be charged now either under the regulatory law as administrative offenses, or under the Penal Code as criminal offenses. This allows important prosecutorial deference for the purpose of distinguishing between violators who are serving localized, subsistence and those who are supplying international markets with high-value wildlife products, such as rhino horn, ivory, and pangolin scales.

With regard to sanitary measures, as noted in the 2020 Library of Congress report on Regulation of Wild Animal Markets, Provincial Decree No. 92 of October 8, 1974 specifies operating conditions and "sets forth the requirements butcheries need to follow to obtain a license to operate in the country, including sanitary standards."[149] Regarding the oversight of sanitary conditions at Angolan butchery sites and wild meat markets, the ongoing challenge of a formal, data-based study of Angolan wet markets noted in this report, as well as by the Library of Congress report, complicates a thorough assessment of public responses since the COVID-19 outbreak. However, the Angolan government's National Institute for Consumer Protection (INADEC) "advise[d] the population to avoid the consumption of game meat marketed in informal markets, since such markets may not maintain proper sanitary practices."[150]

In general, the regulatory parameters for sanitary game meat sales are in place via the 1974 Provincial Decree, including specific language prohibiting proximity to contaminating fumes or dust, requiring conditions such as proper ventilation, adequate lighting, and mosquito netting, and outlining construction materials, spatial dimensions, and other aspects according to the ability to properly wash the spaces. Adequate running water is also a requirement.[151] Additional considerations not noted specifically by the Library of Congress report include electric saws for processing bones and, perhaps most noteworthy, "one or more refrigeration rooms, well-lit and ventilated, and easily cleaned and maintained, with a total capacity of at least double the daily licensed sales."[152] In general, descriptions of sales do not suggest widespread adherence to or enforcement of these standards.

International Trade

As part of its push to build out a stronger regulatory regime and enhanced enforcement opportunities, Angola recently adopted regulations that implement its obligations under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). These regulations establish a broadly applicable export moratorium for wild-sourced fauna and flora, indicating the seriousness with which Angola is working to protect its wildlife. Unfortunately, however, illegal import and export as such are not subject to criminal penalty. Instead, under the new Penal Code, prosecutors will have to use the prohibition of possession of a legally required species, or when relevant, transport of a legally protected species, to charge a criminal offense. In addition, prosecutors can hold perpetrators of wildlife crime responsible for a range of criminal acts, including money laundering and other financial

148. Republic of Angola, Law No. 179, November 11, 2020 at art. 282.

149. Eduardo Soares, "Angola," in Regulation of Wild Animal Wet Markets in Selected Jurisdictions, Library of Congress, August 2020, 5, *https://www.loc.gov/law/help/wet-markets/wild-animal-wet-markets.pdf.*

150. Eduardo Soares, "Angola," in Regulation of Wild Animal Wet Markets in Selected Jurisdictions, Library of Congress, August 2020, 5, https://www.loc.gov/law/help/wet-markets/wild-animal-wet-markets.pdf. See also: *https://perma.cc/4U7T-Z38S.*

151. All of these details were also noted by the 2020 Library of Congress report, pp. 7-8. What was not specifically indicated therein was any requirement for cold storage capacity or electricity. In fact, the netting requirement is specifically in the case that there is not air conditioning available.

152. Provincial Decree No. 92 of October 8, 1974, Annex I.1, pars. n & r, 1469-70, *https://perma.cc/7XHF-8VRB, translated by Ted Geier.*

crimes, illegal possession or use of firearms, trespass, forgery of documents, customs violations, conspiracy, and corruption (as provided in the Practical Guide for Wildlife Crimes).[153]

Livestock Regulation & Public Health Protocols

As noted earlier, in April of 2020, Angola merged several key ministries, reducing regulatory bodies from 28 to 21 and consolidating the Ministry of Fisheries and the Ministry of Agriculture and Forestry.[154] This Ministry has broad responsibilities, with veterinary health oversight via the ISV on live animal imports, for example, and a separate National Food Quality Control Service that oversees general food safety including food sold in traditional markets. In June 2020, "[i]n the context of World Food Safety Day celebrations in Angola, FAO - together with WHO, the Ministry of Agriculture and Fisheries, and the Ministry of Social Action, Family and Women Empowerment - launched an awareness campaign about food safety."[155] As part of this initiative, publicity was focused on the Asa Branca Market, "a formal market at Cazenga municipality in Luanda, and a good example of a clean and organized market."[156] According to existing regulatory organization under the prior Ministries, the ISV had formal authority over all animal health regulation and licensing and, per decree 70/08 of August 11, 2008, is "the body directly responsible for the application of sanitary measures under the Ministry of Agriculture and Forestry. The ISV is responsible for the issuance of several certificates, namely: Hygiene and Sanitary Certificate, Livestock Exploitation License, Sanitary license to import products and by-products of animal origin, Zoosanitary License to import pets."[157] There are also updated Import Regulations as of January 14, 2019, pertaining to all meat. All animals and animal products require an Import Permit from ISV.[158] Exported animals and animal products also require a Veterinary Health Certificate issued by ISV.[159]

CONCLUSION

Despite Angola's riches and considerable economic progress since the end of the war in 2002, the country faces various and some very significant humanitarian challenges. Angola's agricultural resources remain underutilized, and the country is exposed to various risks related to climate change. Food insecurity and malnutrition also remain serious public health problems. These are driven by a range

153. Launched by the Ministry of Environment and the EPI in Nov 2019.

154. "Angola: Angola Reduces Number of Ministries and Makes Key Changes," U.S. Department of Agriculture Foreign Agricultural Service, April 3, 2020, *https://www.fas.usda.gov/data/angola-angola-reduces-number-ministries-and-makes-key-changes.*

155. Food and Agriculture Organization of the United Nations/World Health Organization, "Angola Launches an Information Campaign About Food Safety," Codex Alimentarius International Food Standards, June 17, 2020, http://www.fao.org/fao-who-codexalimentarius/news-and-events/news-details/en/c/1293996/.

156. Food and Agriculture Organization of the United Nations/World Health Organization, "Angola Launches an Information Campaign About Food Safety," Codex Alimentarius International Food Standards, June 17, 2020, http://www.fao.org/fao-who-codexalimentarius/news-and-events/news-details/en/c/1293996/.

157. USDA Foreign Agricultural Service GAIN Report on Angola, including Food and Agricultural Import Regulations and Standards Report, and FAIRS Export Certificate Report, Section I, April 30, 2019, https://agriexchange.apeda.gov.in/IR_Standards/Import_Regulation/FoodandAgriculturalImportRegulationsandStandardsReportLuandaAngola4302019.pdf.

158. USDA Foreign Agricultural Service GAIN Report on Angola, including Food and Agricultural Import Regulations and Stardards Report, and FAIRS Export Certificate Report, Tables 5-6, April 30, 2019, https://agriexchange.apeda.gov.in/IR_Standards/Import_Regulation/FoodandAgriculturalImportRegulationsandStandardsReportLuandaAngola4302019.pdf.

159. USDA Foreign Agricultural Service GAIN Report on Angola, including Food and Agricultural Import Regulations and Standards Report, and FAIRS Export Certificate Report, Table 1, April 30, 2019, https://agriexchange.apeda.gov.in/IR_Standards/Import_Regulation/FoodandAgriculturalImportRegulationsandStandardsReportLuandaAngola4302129.pdf.

of factors including poverty, limited dietary diversity, poor sanitation and hygiene conditions, and gender inequality. The food security situation has been further exacerbated and is currently worsening due to the socioeconomic impact of COVID-19, as well as by the drought across the country in 2019.

The planned expansion and modernization of agricultural production in Angola suggests that existing livestock management and regulatory infrastructures may see even further reorganizations, perhaps returning some Ministries to more explicitly dedicated responsibilities or increasing bureaucratic divisions within existing bodies. Recent public action suggests an active attention to general hygiene risks, at least in the central city markets, alongside consumer demand and awareness of practices such as cold storage, fresh produce sources, and the like. Given that current evaluations, as noted, consider 90% of Angola's agricultural land to be out of use at present, the existing regulatory bodies and oversight mechanisms could accordingly be considered appropriate, perhaps, for only 10% of projected capacity as well. Angola's livestock sector may confront major challenges and shifts in the very near future, if recent investment and development paces are any indication, and will thus at least require an active and vigilant attention to improved hygiene standards and regulation befitting increased production and circulation trends.

Although wildlife crime, and in particular wild meat poaching and illegal trade, is extensive throughout Angola, behavioral change can be induced at all levels to enable significant reduction in wildlife crime in the country. A holistic approach is required, identifying all key drivers and addressing all links of the trade chain. Such a holistic program for wildlife crime action was developed for the Ministry of Environment of Angola in 2011 based on a multi-sectoral approach as well as on regional and international collaboration. Several aspects of this program have been implemented since 2015, with ongoing dynamic adaptation, while other aspects are still in the planning phase.[160] Substantial support for local communities throughout the country is essential, and in particular, in and around the Protected Areas and other ecologically sensitive areas and ecological corridors. This support should focus on extensive participatory consultations and on the development of sustainable alternative livelihoods and economic activities, mitigation of human-wildlife-conflict issues, integrated land use planning, and significantly improved access to education and employment opportunities.

In parallel, a strategically planned awareness campaign is needed, aimed at reducing demand for wildlife crime products at all levels. Specifically, an inclusive, extensive, and intensive countrywide effort to reduce demand for wild meat is of special importance. Such a campaign should focus mainly on the urban demand for wild meat, rather than on consumption by rural communities. A main objective of this campaign would be to change the perception of wild meat consumption among urban societies from a status symbol to socially unacceptable. The link of the wild meat trade and urban consumption to both health hazards and threats to the national and global biodiversity should be stressed. Some efforts toward a holistic program for wildlife crime action in Angola include such an anti-wild meat campaign, launched in 2019, that is largely based on partnerships with the national and local media and on the use of social networks to transfer a simple message: "I protect the biodiversity of Angola; I protect my health and my family; I do not eat wild meat." This program includes the recruitment of national and

160. Measures taken by the Angolan government include: prohibited hunting/trade species lists; hunting season regulation of certain species; financial penalties. See again Gonçalves et al.

local celebrities and change agents as ambassadors to spread the message. However, as of 2021, the campaign appears limited to a video on the MoE's Facebook page with no practical actions of note in force.

Specially designed campaigns addressed at identified critical target-groups are also an essential component. For example, raising awareness of the armed forces in Angola was initiated through an intensive campaign in Cabinda Province in 2003-2004. This campaign has resulted in hundreds of soldiers who were previously involved in poaching joining 'clubs of friends of nature' and pledging to protect wildlife, to avoid wild meat consumption, and to help educate the public. Since then, collaboration between the Ministry of Environment and the army (FAA) has strengthened, and currently the army provides significant support to wildlife protection and enforcement in Angola. The National Parks' rangers are also recruited among demobilized soldiers through this collaboration.

In addition, the National Parks' rangers and staff are engaged in stakeholders' education and in raising awareness at the Provincial and local levels. The Ministry of Environment is also developing both formal and informal environmental education programs, in collaboration with the Ministry of Education and with other relevant line Ministries and departments, as well as through collaboration with the Provincial Governments, local administration, and traditional leadership.

Support for the engagement of rural communities in biodiversity conservation and sustainable management of natural resources, and country-wide awareness campaigns and education, are essential in reducing wildlife crime at both the demand and supply ends. At the same time, the criminal aspects of wildlife crime must be addressed, including adequate legislation, deterrent penalization, and sufficient enforcement. The Angolan legislation was strengthened in this respect, through several decrees since 2005 and the new law for Conservation Areas that was adopted in 2020.[161] International Environmental Law Project (IELP), through a project supported by USFWS and Wildlife Impact, has provided an in-depth analysis of existing legislation with recommendations for improved legislation requirements.

Strengthening enforcement, investigation, and intelligence capacity is also essential, at the local, provincial, and national levels. Considering that wildlife crime is driven by regionally and globally operated crime syndicates, enforcement and intelligence efforts must focus on the criminal level of middlemen and kingpins and must be based on multi-sectoral inter-agency collaboration, as well as on regional and international coordination and cooperation.[162]

Finally, there is an urgent need for surveillance of emerging and re-emerging zoonotic diseases in Angola, including policies supporting laboratory services that would provide diagnosis and routine screening/research. Awareness among health care practitioners is a critical first step, and Angola has begun to undertake these steps in the context of certain zoonotic risks, such as mpox and Ebola. Information and research sharing with neighboring countries is likewise critical to help determine knowledge gaps and plan coordinated interventions where possible.[163]

161. As noted by Joshua Rapp Learn, "[I]n Angola, despite the national park protection in 2011, humans remain present in the parks. Though illegal, killing animals for bush meat or traditional medicine is widespread in the national parks, partly due to limited funding and resources for protection." Joshua Rapp Learn, "TWS2020: Angola Mammals Avoid Humans After 30-year Civil War," The Wildlife Society, September 25, 2020, https://wildlife.org/tws2020-angola-mammals-avoid-humans-after-30-year-civil-war/.

162. Gonçalves et al. indicated no police intervention to control wild meat sales along roadsides and a generally unregulated hunting practice. Ultimately, they call for updated legislation and increased enforcement (157).

163. Benjamin Mubemba et al., "Current Knowledge of Vector-borne Zoonotic Pathogens in Zambia: A Clarion Call to Scaling-up 'One Health' Research in the Wake of Emerging and Re-emerging Infectious Diseases," PLoS Neglected Tropical Diseases,16, no. 2, 2022:e0010193, https://www.proquest.com/docview/2640118843?parentSessionId=X59YFlz1VAs6dxepN1eajHT8KJZ7LIVokqKO3nvvvq4%3D&pq-origsite=primo&accountid=11311.

IMAGES

Rodent bushmeat roadside sale. Benguela, Angola. Photo by Tadeu Bastos.

Rodents bushmeat for Sale. Luanda to Malanje Road. Photo by Jose Agostinho.

Monkeys and duiker wild meat for sale. Uige Province, Angola. Photo by Jose Agostinho.

Child prepares wild meat. Uige Province, Angola. Photo by Jose Agostinho.

As noted by Joshua Rapp Learn, "[I]n Angola, despite the national park protection in 2011, humans remain present in the parks. Though illegal, killing animals for bush meat or traditional medicine is widespread in the national parks, partly due to limited funding and resources for protection." Joshua Rapp Learn, "TWS2020: Angola Mammals Avoid Humans After 30-year Civil War," The Wildlife Society, September 25, 2020, https://wildlife.org/tws2020-angola-mammals-avoid-humans-after-30-year-civil-war/.

Pangolin for sale. Uige, Angola. Photo by Jose Agostinho.

Monkeys and smoked wild meat for sale. Bengo Province (on the road to Uige), Angola. Photo by Jose Agostinho.