**A dissertation submitted to the Department of Environmental Sciences and Policy of Central European University in part fulfilment of the Degree of Doctor of Philosophy**

# Vulture decline in Nigeria: A sociological study of trade in vulture parts for belief-based use

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## ABSTRACT OF DISSERTATION

The problem of illegal wildlife trade is global in scope and is estimated to range from $7 to $23 billion per year including fisheries and timber. In southwest Nigeria, vultures and their body parts are routinely traded in open wildlife markets, a practice which is illegal according to the Nigerian National Wildlife Species Protection Act of 2015. Yet little is known about the socio-cultural factors that influence traders to sell vultures and buyers to buy these threatened species. Old World vultures (African-Eurasian) are among the most threatened group of birds today with a majority of them listed as Critically Endangered; the trade is thought to contribute importantly to their decline in West Africa. Therefore, the aim of this dissertation was to understand how socio-cultural influences have shaped and might be utilized to change the behavioral patterns of traders and buyers of vulture parts for belief-based use. Using Cultural Transmission Theory as a theoretical framework, ethnographic data were collected through semi-structured interviews and non-participant observation of traders and buyers of vultures and their body parts in wildlife markets in Ibadan, Abeokuta, Ijebu-Ode, and Ilorin, southwestern Nigeria. Further, staff of the Federal Ministry of Environment in Abuja, the Federal Capital Territory of Nigeria were purposively interviewed to give context to the study. Results show that, for traders of vulture parts, two socio-cultural factors, namely, cultural transmission (vertical and horizontal transmission) and social support are determinant in shaping behavioral patterns for trade of vulture parts for belief-based use. On the other hand, cultural transmission (vertical and horizontal) was also a determining factor in influencing buyers' behavior to purchase vultures. In both cases of traders and buyers, vertical transmission means transfer of cultural traits from parents to their children while horizontal transmission means transfer of cultural traits to unrelated persons. Socio-demographic attributes were determined for sampled vulture traders in the study area to identify any associated ancillary

factors that could contribute to explaining or changing the behavioral patterns of vulture traders. For example, the mean age of 47 years for vulture traders may suggest that less youth are involved in the trade due to cultural erosion as a result of globalization. Further, the fact that Muslims were the most frequently encountered vulture traders (93.3%; n=30) could be an opportunity to engage them for behavioral change through Muslim opinion leaders. Interviewed Federal Ministry of Environment staff opined that legislative enforcement, awareness campaigns, alternative means of livelihood and research were avenues to stop the illegal trade in vultures. Based on the results of the study and prescriptions from Cultural Transmission Theory, proposals were developed for solving the research problem which entailed: the engagement of religious opinion leaders to bring about cultural change among illegal traders of vulture parts and the role of storytelling in giving rise to new familial values among buyers of vulture parts. Minimizing pressure on vulture populations due to killing for belief-based use could be achieved through demand reduction in southwestern Nigeria through the proposals given in this dissertation complemented by law enforcement.

**Keywords**: illegal wildlife trade, illegal trade in vultures, belief-based use, cultural transmission, cultural change, behavioral change, Nigeria

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# Abbreviations

| | |
|---|---|
| ARC | Alliance of Religions and Conservation |
| CITES | Convention on International Trade in Endangered Species of Wild Fauna and Flora |
| CMS | Convention on the Conservation of Migratory Species of Wild Animals |
| FMenv | Federal Ministry of Environment |
| FWAG | Farming and Wildlife Advisory Group |
| IEC | Information, Education, and Communication methods |
| IUCN | International Union for the Conservation of Nature |
| IWT | Illegal wildlife trade |
| MNCH | Maternal, Newborn, and Child Health |
| MsAP | Multi-species Action Plan to Conserve African-Eurasian Vultures |
| PA | Protected Area |
| SAVE | Saving Asia's Vultures from Extinction |
| TPB | Theory of Planned Behavior |
| WIC | Dutch West India Company |
| WWF | World Wildlife Fund |

# Chapter I. Introduction

## I.1. Background

Illegal wildlife trade (IWT) is a priority conservation issue and is increasing rapidly with significant threats to a variety of wildlife, although there is limited evidence of impact which is mostly restricted to a small number of flagship species (Challender and Macmillan 2014; Milner-Gulland 2018). For example, the impact of the illegal wildlife trade on elephants is evident in the fall in their populations from 1.3 million to 600,000 from 1979 to 1989 due to poaching (Warchol 2004). This study addresses the illegal trade in vulture parts for belief-based use in southwest Nigeria which serves as a hub for business in wildlife parts in the country. With the backdrop of suggestions in the literature that the trade is contributing to vulture declines (Buij *et al*. 2016), the study draws from Cultural Transmission Theory to explain and proffer solutions to the trade from the demand perspective along the vulture parts trade chain. In support of this decision of focusing on the demand sector, Bachmann *et al*. (2019) report in their study of the bushmeat commodity trade chain in Côte d'Ivoire that the most efficacious entry point for intervention along the commodity chain is with the consumer. However, I also retain traders in this study because they could be termed secondary consumers who purchase vulture parts from bulk traders from northern Nigeria in the central market in Ibadan and are relatively more organized and within reach than primary consumers (end users) who are dispersed and affiliated to diverse institutions.

These suggestions in the literature that trade is contributing to vulture declines are compelling due to the magnitude of the trade and the fact that vultures are being sourced from countries outside Nigeria (Nikolaus 2001; Nikolaus 2011; Saidu and Buij 2013). This suggests their scarcity where the trade occurs due to heavy persecution for the trade itself. Study implications include proffering

feasible solutions to minimize the trade to contribute to addressing vulture declines in Nigeria and to some degree in the wider West African sub-region.

## I.2. Problem statement

IWT is a global problem estimated to be worth $7 to $23 billion per year including fisheries and timber (Nellemann *et al.* 2014). What primarily motivates wildlife trade are economic factors, ranging from small-scale local income generation to major profit-oriented business (Nijman 2010). However, cultural factors also drive the illegal trade in wildlife (Nekaris *et al*. 2010). In West and Southern Africa, vultures and their parts are routinely traded for belief-based use (Sodeinde and Soewu 1999; Cocker 2000; Nikolaus 2001; Beilis and Esterhuizen 2005; Saidu and Buij 2013), but are also hunted for food in Nigeria, particularly the hooded vulture (*Necrosyrtes monachus*) (Ogada and Buij 2011). It is illegal to trade vulture parts for belief-based use in Nigeria. For instance, Hooded Vulture is listed in *Schedule 1* of the *National Wildlife Species Protection Act* of 2015 (The National Wildlife Species Protection Act 2015). Nevertheless, Nigeria has been reported as an important focus of the regional trade in raptors in West Africa (Buij *et al*. 2016). Based on their extrapolations, Buij and colleagues (2016) estimate that within West Africa, 73% of raptor carcasses were traded in Nigeria, 21% in Benin and 5% in other countries. The trade in raptors for belief-based use or for food has probably contributed significantly to the precipitous fall in vulture populations (Buij *et al*. 2016). It is common to see vulture parts in open markets in Nigeria and other West African countries where they are used for belief-based purposes and sorcery (Ogada and Buij 2011), and a strong market presence for vulture parts has been observed in both southwest (Awoyemi 2014) and northern Nigeria (Saidu and Buij 2013) (Figures 1-2).

**Figure 1. Man holding captured hooded vulture for sale in a wildlife market in Ibadan, Nigeria**

**Figure 2. Rüppell's and African White-backed Vultures' heads for sale at a wildlife market in Ibadan, Nigeria**

Given this conservation problem, existing literature has yet to utilize sociological theories to explain the trade in vulture parts for belief-based use even though several authors have highlighted the problem (Sodeinde and Soewu 1999; Nikolaus 2001; Beilis and Esterhuizen 2005; Nikolaus 2011; Saidu and Buij 2013; Awoyemi 2014). This study seeks to deepen understanding of this trade and suggest informed solutions for moving forward.

Why is it important to reverse the decline of vultures? Vultures provide important ecosystem services that are beneficial to humans (Ogada *et al*. 2011; BirdLife International 2016). They help dispose of waste and carrion making them one of the most effective sanitation service providers in nature (BirdLife International 2016). Vultures help clean up carcasses and potentially prevent spread of infectious diseases such as rabies, tuberculosis, and anthrax, protecting the health of humans, domesticated animals, and wildlife (Markandya *et al*. 2008; Ogada *et al*. 2011). Where this ecosystem service is lacking it purportedly leads to increases in other scavengers that are disease reservoirs such as feral dogs (Markandya *et al*. 2008). For instance, the decline of vultures in India has indirectly the cost government $34 billion in treating rabies in humans due to increased feral dogs replacing vultures (Markandya *et al*. 2008). Grilli *et al.* (2019) estimate the removal of about 1000 tons of organic material yearly by the turkey vulture (*Cathartes aura*) which is valued in financial terms to be greater than 500,000 USD per year for only 0.07% of its overall distribution. Vultures, as scavengers, help speed up the decomposition rate of carrion, contributing to the nutrient cycling dynamics of ecosystems (Parmenter and MacMahon 2009).

Vultures are also valued for cultural reasons. In Tibet for example, vultures are used in traditional funeral customs, whereby bodies of the dead are placed on platforms to attract vultures (Pariona 2017). The ingestion of these dead bodies by vultures is believed to be one final good deed the dead human can give another living creature such as the vulture (Pariona 2017). In Nigeria, among

the Yoruba, vultures have several cultural values (Weliange *et al*. 2015). First, vultures are known as *Igun* by the Yoruba, and are forbidden to be killed and eaten because, according to traditional folklore, those who kill them may be harmed (Weliange *et al*. 2015). Second, because vultures gather in a group to eat carcasses, they are believed to be omens of death (Weliange *et al*. 2015). Third, the saying *Igúnugún bà lé òrùlé, ojú tólé ojú tóko* means that "when a vulture perches on the roof it sees everywhere" (Weliange *et al*. 2015: 46) and is used to connote the fact that someone is watching everything. Last, many cultural beliefs are associated with vultures in terms of their perceived utility in curing humans of various diseases and bringing fortune (Saidu and Buij 2013).

To reverse vulture declines in Nigeria, it is important to understand the social dimensions of the trade of vulture parts for belief-based use so that the behavior of traders and buyers alike may be understood and managed towards conservation of threatened vultures. A few studies such as Saidu and Buij (2013) and Awoyemi (2014) have looked at some social aspects of trade in vulture parts for belief-based use, however, none so far has utilized sociological theories in understanding the behavioral patterns driving the practice.

## I.3. Significance of study

This study is relevant to the field of conservation biology and environmental sciences at large for several reasons:

- the study deals with seeking to minimize the activity of illegal trade in vulture parts for belief-based use as it relates to poaching of vultures to satisfy market demand.
- it is timely because African vultures are among the most threatened, rapidly declining birds in the world (Ogada *et al*. 2016; Botha *et al*. 2017). The study contributes to operationalizing objective 4 of the Convention on the Conservation of Migratory Species

of Wild Animals (CMS) Multi-species Action Plan to Conserve African-Eurasian Vultures (Vulture MsAP) which is "To reduce and eventually to halt the trade in vulture parts for belief-based use" (Botha *et al.* 2017:9). During the conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) held in August 2019, West African vultures were discussed for the first time, and it was mandated that a working group be formed that will study the international vulture trade and create and implement policies to conserve vultures (BirdLife International 2019).

- it is significant because vultures in West Africa, and Nigeria in particular, are threatened with extinction (Ogada *et al*. 2016), and vultures potentially provide critical ecosystem services which inter alia benefit humans (Ogada *et al*. 2011, 2012).
- it is especially interesting theoretically because it delves into poorly explored aspects of the field of conservation biology concerning sociological theories and how they can be used to explain human behavior and relationships in trade in flora/fauna for belief-based use.

## I.4. Research aim and questions

The aim of this research is to understand how socio-cultural influences have shaped and might determine the behavioral patterns of traders and buyers of vulture parts for belief-based use. The foregoing will be addressed through the following research questions:

RQ 1. What socio-cultural factors shape the behavioral patterns of traders and buyers of vulture parts for belief-based use, and how?

RQ 2. Based on 1. above, how can the trade in vulture parts be minimized?

**Research question 1**: Cultural Transmission Theory was utilized as a framework to answer this question, through non-participant observation, and qualitative interviews of traders and buyers of vulture parts in four cities (Ibadan, Ilorin, Ijebu-Ode and Abeokuta) in southwestern Nigeria.

**Research question 2**: Cultural Transmission Theory was utilized as a framework to answer this question, through interviews of traders and buyers of vulture parts and an analysis of relevant literature. Staff of the Federal Ministry of Environment (FMenv), Abuja, Nigeria, were purposively interviewed to understand if there are any potential policy responses to the trade in vulture parts for belief-based use and what challenges lie in the way, if any.

## I.5. Structure of this dissertation

This dissertation comprises six chapters. Chapter I gives a background to the study, presents a problem statement for the research, highlighting the significance of the study, and presents its research questions. Chapter II, the literature review, gives an overview of the central issues connected to the research problem through highlighting of the IWT (globally and in Africa), its history and current state. It further discusses belief-based use of wildlife on a global level and in Africa, then theoretical approaches to human-wildlife interactions including the theoretical framework for this study. The chapter then discusses vultures, their biology, threats facing them, and efforts made to save these birds. Chapter III, the methodology, highlights the methods used in carrying out the research including ethical considerations, data collection and analysis. Chapters IV and V are results-based, answering, and discussing RQ1 and RQ2, respectively. Chapter VI concludes the dissertation by looking at the future of illegal trade in vultures and belief-based use in West Africa and the theoretical, practical contributions of the dissertation to the field of conservation social science and policy and avenues for further research. It finally makes a synthesis of key points and major conclusions of the dissertation.

## I.6. Summary

The introductory chapter serves as a point of departure for the dissertation. It provided a brief background to the study and introduced the research problem, stated the relevance of the study to the field of conservation biology and highlights the research aim and questions. Finally, the thematic development of the research was outlined. With this basis, the dissertation will proceed to the literature review in the next chapter.

# Chapter II. Literature review

## II.1. Introduction

In this chapter I develop themes of scholarly information related to the research topic to inform a holistic understanding and give foundation to the study. The literature review is developed to determine the central issues connected to the research problem and to identify gaps in the academic literature.

First, this chapter provides an overview of the IWT and then established theoretical approaches for understanding and resolving human-wildlife interactions. Second, a discussion on the theoretical framework for this study is given. Finally, the chapter provides a review of vulture biology and threats facing this taxonomical group, with associated global and regional efforts for conserving these birds.

## II.2. Global illegal wildlife trade

IWT is an increasing global problem running into billions of US Dollars, next to trafficking in narcotics, weapons, and humans (Guynup *et al.* 2020). It is characterized mainly by demand from rich countries with more disposable income, impacting source countries where biodiversity is rich and target species threatened due to these pressures (van Uhm 2016; WWF 2020). However, it is not in all cases that wildlife is sourced from poor to rich countries. In other instances, wildlife is traded across national borders in the same region to meet the shortfall of a particular wildlife product in a country. For example, wildlife traders in Nigeria source vultures and their body parts from outside the country, going as far as Chad, Niger, Benin, Cameroon, and Sudan (Saidu and Buij 2013). In essence, IWT is defined as the act of illegal obtaining, transporting, and distributing

– internationally and domestically – of wildlife, wildlife parts and their products, in violation of laws, foreign and domestic, and treaties (Wyler and Sheikh 2008).

Although trade in rhino, elephant and tiger products are more widely known, other species are substantially affected, such as those in the taxa of birds, reptiles, fish, insects, fungi, and plants like orchids, aloes and timber-producing trees (‘t Sas-Rolfes *et al.* 2019). Actors that are involved in IWT are in the categories of those that harvest, trade, and use wildlife illicitly (Phelps *et al.* 2016), while mitigation measures are classified into a) supply-side b) transactional and c) demand-side (‘t Sas-Rolfes *et al.* 2019). Supply-side interventions comprise those that focus on the reduction of illicit harvesting and seek to provide legal substitutes (‘t Sas-Rolfes *et al.* 2019). Transactional measures focus along the trade chain between harvesting and end users, while demand-side interventions target final consumers of the wildlife products and aim to facilitate their behavioral change (‘t Sas-Rolfes *et al.* 2019). Based on regular observations, illegal traders have been classified into (i) “small-scale illegal traders”, (ii) “legal traders involved in illegal trade”, and (iii) “criminal organizations” (van Uhm 2016:108).

In line with mitigating IWT, international donor support is increasing. Between 2010 and 2016, over US $1.3 billion has been donated to tackle IWT in Africa and Asia, with five main donors (Global Environment Facility, Germany, United States, European Commission, and the World Bank Group) together responsible for contributing US $1.1 billion of all the funds (World Bank 2016). Five countries received the highest amount of funds totaling US $328 million: Tanzania (8%), the Democratic Republic of Congo (5%), Mozambique (5%), Gabon (3%) and Bangladesh (3%) (World Bank 2016). Estimates of the proportions in which this funding was targeted are approximately 46% supporting protected area management to prevent poaching, 19% law

enforcement, 15% sustainable utilization and alternative livelihoods, 8% policy and legislation, 6% research and evaluation, and 6% communication and raising awareness (World Bank 2016).

The clandestine nature of IWT makes it difficult to give an accurate estimate of the value of the trade, therefore most estimates have so far been speculative (Wyler and Sheikh 2008). Nonetheless, scientists acknowledge that the illicit trade in wildlife is very lucrative with harmful impacts on biodiversity (Wyler and Sheikh 2008; WWF 2020). Yet local governments give this issue poor attention because of lack of perception of its threat to wildlife and human wellbeing (Toledo *et al.* 2012). However, the current global coronavirus pandemic (Covid-19) might have instigated some level of awakening by governments on the risk of spread of zoonotic diseases and potential public health harm by IWT. For instance, in early 2020, the Chinese government banned farming, trading, and feeding of terrestrial wildlife because of the coronavirus outbreak (Huang *et al.* 2021). But Roe *et al.* (2020) have argued that bans can worsen conservation risks by driving the legal wildlife trade underground. Further, suggested actions to address associated risks of IWT go far ahead of addressing these risks to risking increased poverty, repressing human rights, spoiling conservation incentives, and negatively impacting sustainable development (Roe *et al.* 2020). Therefore, addressing global IWT must properly navigate these social realities by ensuring regulatory mechanisms and behavioral interventions recognize and operate within the socio-economically embedded nature of IWT.

Apart from posing a public health risk, IWT has been reported to fuel armed conflict (Barron 2015). The trade is transferring funds into the purses of militant and terrorist groups and instigating violence that is spreading throughout Africa and spilling across international jurisdictions (Barron 2015). Further, because of the rising value of IWT, highly organized destruction of wildlife is being executed by militant groups involving large-scale killing of wildlife and the control of

biodiversity-rich expanses of land (UN 2013). For example, one group that profits from IWT is the Lord's Resistance Army, a militant rebel group that has a long history of committing heinous crimes in Africa, dating back to the 1980s (Barron 2015). Another terrorist group, the Janjaweed has its operations connected to regional criminal and poacher networks in the Central African Republic and the Democratic Republic of Congo (Barron 2015). To solve this problem, national governments of many source, transit and destination countries are developing and implementing strengthened regulations and laws to combat IWT (Barron 2015).

To get a more in-depth review, I will hereafter focus on the historical origins of IWT, its current state globally, belief-based use of wildlife globally and then narrow down to Africa where I look at IWT in the continent and belief-based use of wildlife therein.

### II.2.1. Historical perspective

Wildlife trade has been traced to origins in ancient civilizations as far back as that of the Egyptian Pharaohs (~3500 - 500 BCE) with ivory suggested as possibly preceding gold as the first globally traded commodity (Naylor 2005; van Uhm 2016). The ancient Egyptians utilized ivory as early as their initial dynasties to make jewelry and carvings and might have instigated the emergence of the world market to meet Egyptian needs (Naylor 2005). Egyptians acquired ivory by plunder, trade or tribute from Nubia, Somalia, and Ethiopia (Naylor 2005). The first African explorer to be known by name in history, Harkhuf, traveled through Nubia from Abu Simbel to Kerma to Lower Nubia, to sell ivory in the 23rd century BCE with the Nile used as a trade passage (Kirwan 1963). Using this trade route, luxury-loving Egyptians obtained ivory and ebony, leopard skins, giraffe tails, and ostrich feathers (Kirwan 1963).

Queen Hatshepsut of Egypt is believed to have established the first recorded zoo, and in the 16th century BCE, is reputed to have possessed a large palace menagerie with monkeys, leopards, birds,

and giraffes (Mason 1999). In those days, royalty saw obtaining and exhibiting exotic flora and fauna as effective avenues to increase prestige or to show imperial dominion over distant lands (Foster 1998).

Following the Egyptian civilizations, the Roman and Greek antiquity (~500 BCE – 500 CE), after 700 BCE, were known to commonly display exotic animals in menageries and gardens (van Uhm 2016). Different types of practices both general and exclusive brought new wildlife to Europe's southern lands in ancient times and most Greek and Roman temples possessed sacred groves that were home to different kinds of animals which included exotic wildlife (Hughes 2003). For example, the ancient Temple of Hera on the Island of Samos contained African wildlife remains all of which were excavated by archaeologists (Hughes 2003). Greeks and Romans caught and domesticated different kinds of wildlife in their homes, including apes, ungulates, and snakes (van Uhm 2016).

The trade in exotic wildlife was significantly heightened with the arrival of Roman amphitheaters (van Uhm 2016). Exotic wildlife was used in the entertainment of many people in a variety of ways (Hughes 2003) and concomitantly the wildlife trade was becoming a profitable business where for instance a leopard cost 4,000 sesterces[1] (35,390 USD), and an African lion cost 600,000 sesterces (5,661,509 USD) (Bomgardner 2000).

In Medieval Europe, the presence of exotic wildlife across the region from the 11th to the 15th century was documented and supported occasionally by archaeological findings (Pluskowski 2004). The Vikings and Arabs were the main traders in wildlife and wildlife products, trading in hide, ivory, and tusks of wildlife from Iceland and northern Greenland (van Uhm 2016). Other

[1] ancient Roman coin and monetary unit

traded commodities were exotic furs which were symbols of power and status of the elite in medieval society (van Uhm 2016). Overall, however, in comparison with the acquisition of exotic wildlife in ancient Rome, the demand for exotic animals was relatively low in the Middle Ages (Hoage and Deiss 1996).

The global wildlife trade increased in the beginning of the modern era (~1500 – 1800 CE) with the arrival of European imperialists (van Uhm 2016). Trade companies were established by Europeans who traversed Africa, Asia, and South America. Examples of such companies were the British East India Company, Dutch East India Company (VOC: *Vereenigde OostIndische Compagnie*) and Dutch West India Company (WIC) all of which traded in exotic wildlife (van Uhm 2016). For example, ivory from African elephants (*Loxodonta africana* and/or *Loxodonta cyclotis*) were obtained from West Africa by the WIC into the Dutch Republic (Rijkelijkhuizen 2009). From 1675 to 1731, WIC carted away a total of 2,955,533 lbs of ivory (2,512,280 guilders[2]) from the Gold Coast, amounting to 10.3% of all the cargo (Rijkelijkhuizen 2009).

Just like in ancient times, exotic wildlife continued to be a status symbol in early modernity with the emergence of European imperialism and the bourgeoise began to widely imitate the elite's fashion preferences, bringing about a larger influx of wildlife to meet this new demand (van Uhm 2016).

From the early nineteenth century onwards, the trade in exotic wildlife persisted with colonies supplying imperialists with a variety of wildlife. These were used in the science of natural history, zoology, and the establishment of zoos (which were different from menageries in that they were not for the elite but for education, entertainment, and recreational purposes of the public) (van

[2] The basic monetary unit used in the Netherlands before the introduction of the Euro in 2002.

Uhm 2016). For example, the London Zoo was established in 1828 and the Amsterdam Zoo in 1838 (van Uhm 2016). By the twentieth century, the possession of a wide variety of non-native wildlife by discrete classes of society had become trendy and one could buy exotic wildlife in a variety of department stores throughout Europe (van Uhm 2016). In the 1960s, coats made from skins of large cats or bears became status symbols in Europe and America, where for example, the US first lady Jackie Kennedy was dressed in a leopard skin coat when visiting the US Ambassador in Rome in 1962 (van Uhm 2016). These role models for many people began to elicit demand for non-native wildlife among the middle classes which caused a rise in demand of wildlife and their corresponding decline (van Uhm 2016). Overall, the 20th and 21st centuries, characterized by a great rise in prosperity and technology, brought about more sophisticated trade in exotic wildlife with growing markets (van Uhm 2016).

### II.2.2. The current state of illegal wildlife trade globally

The IWT is a global problem in the 21st century with an international network of suppliers, distributors, middlemen, and traffickers who have connections with government officials in source and destination countries (Wilson-Wilde 2010). The demand for wildlife fueling the IWT has risen and is intrinsically related to economic growth and ongoing globalization (Nijman 2010). For example, increasing wealth among the middle class with more disposable income has led to escalating demand for wildlife in Southeast Asia, especially China and Vietnam (Duffy *et al*. 2015). This in turn has led to extensive illegal and unsustainable trade in keystone endangered wildlife that include rhinoceroses, elephants, and big cats, but also pangolins, rosewood trees, and marine species such as sharks and sea turtles (Nijman 2010; UNODC 2016). Rosen and Smith (2010) presented an in-depth description of the IWT using 12 years seizure data documented by TRAFFIC, the wildlife monitoring network. The data revealed that 967 seizures consisted of large

quantities of ivory, tiger skins, live reptiles and other threatened wildlife and wildlife derivatives with most seizures originating from Southeast Asia (Rosen and Smith 2010).

Similarly, in South America, IWT is widespread. For instance, in Brazil, the illegal trade in birds is made up of an extensive trade network that distributes wildlife to all parts of the country (Alves *et al.* 2013). In their study of the sale of live birds in Brazil, Alves and colleagues discovered that at least 295 bird species are illegally traded as pets, with data informed projection of greater than 400 species (23% of extant bird species in Brazil). Of these bird species documented, 2 are classified as "Critically Endangered", 9 as "Endangered", 6 as "Vulnerable", and 19 as "Near Threatened" according to the International Union for the Conservation of Nature (IUCN) Red List (Alves *et al.* 2013). Forty percent of organized crime has been linked to wildlife crime in Brazil and this is increasing, partly because of differences between legal consequences and financial profits when compared to other kinds of crime (Wilson-Wilde 2010). The IWT in South America is also international in scope and has been linked to Asia. For example, confiscation of hundreds of jaguar heads and canines in Central and South America between 2014 and 2018 drew international media attention indicating that illegal wildlife traders are selling jaguar body parts in lieu of tiger parts to meet the need for Asian traditional medicine (Morcatty *et al.* 2020). In reaction to this, a study was conducted to identify the trends in the confiscation of wild cats from 2012 to 2018 (Morcatty *et al.* 2020). Researchers confirmed that 34% (32 of 93) of jaguar-part confiscation reports were associated with China and these seizures comprised fourteen-times more individuals than those meant for local markets (Morcatty *et al.* 2020).

Another characteristic feature of the past decade is that IWT in open markets is moving to or being complemented by online platforms (Nijman *et al.* 2019). Social media platforms such as Facebook, Instagram, WhatsApp, and WeChat have made IWT easier (Guynup *et al.* 2020). For example, the

Critically Endangered ploughshare tortoise (*Astrochelys yniphora*), an endemic species to Madagascar, is now being traded illegally on online platforms and social media in Indonesia (Morgan and Chng 2018). Studies conducted by TRAFFIC of online trade in ploughshare tortoise in Indonesia during 2010-2015 identified 88 advertisements trading 126 ploughshare tortoises from 49 traders (Morgan and Chng 2018). Fifty-six percent of the advertisements were found on virtual retail sites and 43% on social media. Advertisements on social media have increased at a steady pace since 2012, to >90% in 2015 (Morgan and Chng 2018). Scientists report that the virtual world provides Indonesian traders avenues to illegally trade endangered wildlife comparatively safely and easily (Morgan and Chng 2018).

The review of the international dimensions of the IWT is relevant to this dissertation because the illegal vulture trade in southwest Nigeria extends beyond Nigeria into various West African countries (Saidu and Buij 2013) and the evolution of the trade into online platforms is already happening in wildlife markets in southwest Nigeria as well (pers. obs.). This brings the next focus of the chapter to a review of the IWT in Africa.

### II.2.3. Illegal wildlife trade in Africa

In recent years there has been a rapid rise in IWT and the persistent erasure of endangered species has reached an alarming frequency in Africa (Merem *et al.* 2018). Poaching and IWT have put many bird, mammal, and amphibian species at risk of extinction (Merem *et al.* 2018). For instance, due to IWT and habitat loss, Africa's elephant populations have seen massive destruction – from 26 million in 1800 to less than 1 million in 2013 (National Geographic Society 2013). In 2015, the continental population was estimated at 415,000, although with probably an additional 117,000 to 135,000 (IUCN 2016). Illegal killing of elephants at unsustainable levels between 2010 and 2012 peaked at ~ 8% in 2011 which extrapolates to ~ 40,000 elephants destroyed (Wittemyer *et al.*

2014). Yet, ivory is still publicly displayed in open markets with absolute disregard in cities of African nations like Lagos, Nigeria for example (Martin and Vigne 2013). Beyond domestic trade, international demand for elephant ivory and rhino horn in southeast Asia is causing heavy poaching of these wildlife in Africa (Save The Elephants 2021; Save The Rhino 2021a). The value of illegally traded African ivory on the streets of Asia is estimated to be about USD 165 – 188 million in combination with ivory from Asian sources (Nellemann *et al.* 2014). Ninety-four percent of the illegal killing of rhinos takes place in Zimbabwe and South Africa which harbor the last populations and rhino horn as of 2013 was valued to be about USD 63.8 – 192 million (Nellemann *et al.* 2014). Over 1,000 rhinos were killed by poachers each year between 2013 and 2017 in South Africa which holds most of these rhinos (Save The Rhino 2021b). Given IWT's lucrativeness, it attracts global crime syndicates and armed bandits in Africa that become involved in the trade, depleting wildlife due to consumer demand in Asia (Merem *et al.* 2018; Save The Rhino 2021a).

Beyond these iconic species, there are lesser-known wildlife that are illegally traded in Africa. For example, the abalone (*Haliotis midae*) endemic to South Africa is of commercial value and has been overexploited due to illegal trade to meet demand in East Asia (Steinberg 2005; Raemaekers and Britz 2009). Similarly, illegal trade in pangolin (*Manis* sp.) scales for traditional Chinese medicine and its meat as delicacy has led to the pangolin becoming the most trafficked mammal globally (Bale and Fobar 2020). The resulting pangolin decline in Asia is shifting demand increasingly to Africa, where indigenous use may already endanger pangolins (Shepherd *et al.* 2016). Over 128 tons of pangolin scales and meat were seized worldwide in 2019 – a 200% increase from the previous five years (Bale and Fobar 2020). Birds are another taxon under pressure from IWT in Africa. However, there is little information on the extent of how illegal killing, taking and trade impacts wild birds in Sub-Saharan Africa (BirdLife International 2021a).

Despite this, there is data to suggest that certain species are heavily under pressure (BirdLife International 2021a). For instance, 97% of the 41,737 African grey parrots (*Psittacus erithacus*) sold through Singapore between 2005-2014 had their source from Congo, Democratic Republic of the Congo, the Central African Republic, Guinea, Ivory Coast, Cameroon, Liberia, and South Africa, with Democratic Republic of the Congo being the highest exporter (BirdLife International 2021a). Birds are also traded domestically within the continent, driven by food, income, and belief-based use (BirdLife International 2021a). Belief-based use is particularly a threat to large birds such as vultures and African ground hornbills (*Bucorvus* sp.) (BirdLife International 2021a).

The factors driving the IWT in Sub-Saharan Africa are diverse and complicated, differing temporally and spatially or by sector, depending on community and crime involved (Price 2017). In general, the major economic drivers of IWT in Sub-Saharan Africa are rising demand in end user countries in East Asia; poverty in countries where the wildlife originates from; absence of livelihood options and subsistence in source countries; and cultural and imperialist heritages in Sub-Saharan Africa (Price 2017). Further, other factors create an enabling atmosphere for IWT in Sub-Saharan Africa including poor governance, corruption, inadequate regulation, and enforcement (Price 2017). In general, the effects of IWT are a net positive short-term effect on discrete persons and a net negative long-term effect on local people and nations (Price 2017).



### II.2.4. Belief-based use of wildlife – a global overview

Belief-based use of wildlife has existed for millennia and is a common heritage shared by all human communities (Cocker 2000). It encompasses a wide variety of perceived medicinal, spiritual, and ritual practices that involve the killing and consumption of wildlife or their body parts (Gore *et al.* 2020). For instance, ancient Greeks believed that staring directly into the eyes of a stone curlew (*Burhinus oedicnemus*) could cure a patient of jaundice (Cocker 2000). Other

beliefs include consumption of the eyes of an owl would improve eyesight and consuming the tongues of nightingales (*Luscinia megarhynchos*) was expected to improve voice quality. Further, the brains of a crane were considered a strong aphrodisiac and the vulture's liver was deemed the ultimate solution for gout, indigestion, and cataracts (Cocker 2000).

These cultural beliefs associated with wildlife are still prevalent in many societies around the world. Even though many belief-based use of wildlife medicines have been scientifically refuted, there is still widespread use of these medicines (UNODC 2013). In China, according to ancient Chinese traditional medicine texts, rhino horn is used to cure fever, rheumatism, gout, snake bites, hallucinations, typhoid, headaches, carbuncles, vomiting, food poisoning and "devil possession" (Save The Rhino 2021a). These beliefs, which are more than 2,000 years old, still persist in China and Vietnam (Truong *et al*. 2016; Save The Rhino 2021a).

In Cambodia, Khmer medicine practitioners believe slow lorises (*Nycticebus* sp.) cure 100 diseases and women consume a loris rice wine tonic after childbirth (Nekaris *et al.* 2010). Lorises are also used for healing wounds, damaged bones and treatment of venereal diseases and asthma (Nekaris *et al.* 2010). Similarly, in North Sumatra Province, Indonesia, indigenous communities believed that burying lorises beneath the foundations of a house would result in good fortune and that lorises' body parts could be utilized in cursing enemies (Nekaris *et al.* 2010).

In Mexico, 163 animal species of 79 families and 4 taxonomic groups are reported to be for belief-based use (Alonso-Castro 2014). An estimated 46% of these animals are reported to treat multiple illnesses and most folk medicines are given in the form of soups with the use of animal products such as meat, fat, and skin (Alonso-Castro 2014). Traditional healers in rural areas are reported to acquire their healing knowledge by a) self-knowledge, b) dreams or c) instruction from ghosts (Gallardo-Arias 2004). Because these foundations are based on beliefs, they certainly drive the

belief-based use of wildlife among Mexicans. Thirty-five percent of animals used for traditional medicine in Mexico are for magico-religious purposes (Alonso-Castro 2014). For example, Montezuma quail (*Cyrtonyx montezumae*), white-tipped dove (*Leptotila verreauxi*) and cane toad (*Rhinella marina*) are each utilized to heal a disease that is forced on people by ritual and called "mal de ojo" (evil eye) (Alonso-Castro 2014). White-winged dove (*Zenaida asiatica*) is used to heal people of "mal aire", a local terminology which is associated with spirits of those who died violently and then attack other people (Alonso-Castro 2014).

Accordingly, a wide variety of wildlife of different taxa are utilized for medicinal, cultural, and religious purposes. For instance, the belief-based use of canids is widespread and has been documented to occur in 27 countries, mainly in Latin America, Africa, and Asia (Alves *et al.* 2010a). An estimated 28 conditions are believed to be treated by canids, such as asthma, arthritis, backache, bronchial illness, bronchitis, chicken pox, cracks in the sole of the feet, and magico-religious purposes like bringing good fortune and for ritual ceremonies (Alves *et al.* 2010a). Similarly, 30% (n=20 of 67) of primate species are reported as being utilized to treat more than one illness (Alves *et al.* 2010b). There are a variety of ways used to prepare and administer medicines. For example, the bones and fur are in most cases, sun-dried, ground and taken as tea or when feeding (Alves *et al.* 2010b). Meat, brain, oil, fat, and blood can be consumed or utilized as ointment (Alves *et al.* 2010b). It is common occurrence in different countries to observe primates associated with myths and beliefs and their being used for magico-religious purposes (Alves *et al.* 2010b). Documented use of mammals in general span 131 countries of the ~ 200 countries in the world, majorly in Asia, Latin America, and Africa (Alves *et al.* 2020). The whole body of the mammal or mostly body parts or derivatives are used for medicines. These include for example,

ankle, anus, bile, blood, bones, bone marrow, brain, cartilage, claws, dung, ears, and eyes (Alves *et al.* 2020). These mammal products were recorded to treat 371 ailments (Alves *et al.* 2020).

Wildlife and wildlife products are used in treating a variety of diseases and a single disease could be treated by different animal species (Alves and Alves 2011). For instance, 215 animal species have been utilized in the treatment of asthma and 95 for treating rheumatism (Alves and Alves 2011). Alternatively, many species could be used as remedies for multiple ailments. For example, products derived from the teju (*Tupinambis teguixin*) and the boa (*Boa constrictor*) are used to treat 29 and 30 conditions, respectively (Alves and Alves 2011).

However, even though majority of these wildlife medicines used by communities lack a scientific basis, where empirical experimental research was employed, scientists have found pharmaceutical agents in some wildlife. For instance, the venom of the Gila monster (*Heloderma suspectum*) has been used to develop the extenatide polypeptide Byetta® which is used to enhance blood sugar control in type 2 diabetes patients (Cragg and Newman 2013). Further, the poisonous frog (*Epipedobates tricolor*) from whose skin was extracted epibatidine is used in the development of new potential painkillers (Daly *et al.* 2005). Based on the foregoing, scientists can verify or establish the most likely claims by traditional healers of the medicinal value of wildlife and where potential pharmaceutical agents exist, these could be synthetically compounded rather than depend on wild populations which could lead to biodiversity depletion as is the case with the pressure by communities on wildlife for remedies.



**II.2.5. Belief-based use of wildlife in Africa**

Africans depended on traditional healing long before the arrival of orthodox medicine and utilized wildlife and their products in the preparation of curative and preventative medicines (Adeola 1992). Most Africans believe in the magico-religious functions of wildlife products as prescribed

by traditional healers (Adeola 1992). There is also a common belief among many African cultures that illness, success, or ill luck are not chance events but due to the active influence of persons or ancestral spirits (Berglund 1976; Anthony *et al.* 2011). Wildlife products are important for cultural festivals (e.g., masquerades, burial ceremonies and for coronation of traditional rulers), invoking and appeasing ancestral gods and witches (Adeola 1992). Similarly, Sodeinde and Soewu (1999) discovered wildlife in Nigeria is used in making preventive and curative medicines, fertility medicines for women, aphrodisiacs and potency medicines for men, appeasing spirits, and gods and for other conditions.

In South Africa, wildlife is also commonly taken for belief-based use in healing illnesses or for magical purposes such as improving relationships or achieving good luck (Whiting *et al.* 2013). In a study of Tsonga local communities of Limpopo Province, South Africa, 47 faunal taxa were identified as being exploited by these communities with 29 (61.7%) of the taxa directly used for ornamental-religious purposes (Anthony and Bellinger 2007).

Sixty-three traditional healers were interviewed in Sierra Leone on the traditional medicinal use of pangolin parts (Boakye *et al.* 2014). A total of 22 pangolin parts were discovered to be in use to treat a variety of ailments with scales recorded as highest in use and eyes had the greatest level of consensus in terms of what they are used for among traditional healers. Scales are used in treating skin disease, impotence, infertility, broken ribs, stomach diseases, inflammation of the navel, for bullet proofing, cutlass proofing, protection from witchcraft, and spiritual protection among others (Boakye *et al.* 2014). In Accra, Ghana, 20 out of 43 species of animals (47%) were discovered to be utilized to treat ailments while 30 species (70%) were linked to spiritual purposes usually in the form of magical charms (Gbogbo and Daniels 2019). For example, frogs (*Rana spp.*) are used in the treatment of injuries and the oil of the African rock python (*Python sebae*) is used

in the treatment of hearing difficulty (Gbogbo and Daniels 2019). Wildlife used for magico-religious purposes include chameleons which are tied to the hands of children to prevent premature death and hooded vultures burnt and based on incantations prepare the user against spiritual attacks (Gbogbo and Daniels 2019).

Interviews of fetish traders in Togo revealed that the grey parrot was used for medicinal and spiritual purposes such as the head for improving memory, feathers for attracting clients, love and to help with divorce (Assou *et al.* 2021). Further, entire parrot carcasses and parrot heads are also used for good fortune and protection from witchcraft (Assou *et al.* 2021).

Among the Yoruba in southwest Nigeria, the pangolin is used in treating a total of 42 conditions (Soewu and Ayodele 2009). These include but are not limited to infertility, gastro-intestinal disorders, safe delivery in childbearing, stomach ulcers, rheumatism, and fibroid (Soewu and Ayodele 2009). These remedies are also inclusive of magico-religious purposes, such as increasing sales, antidote to sexual poisons, warding off ill luck, appeasing witches, evil forces and for making money rituals (Soewu and Ayodele 2009). Vulture parts are also used to treat epilepsy, mental illness, stroke, safe delivery in women, spiritual protection against witches, evil spirits, good fortune for gambling and competitions, to stimulate walking in little children and to acquire spiritual power (Saidu and Buij 2013). The vulture head is also very important due to the belief by many that it has clairvoyant powers (Saidu and Buij 2013).

The problem of IWT for belief-based use in Nigeria is partly concentrated in southwest Nigeria (Awoyemi 2014). Nikolaus (2001) observes that the sale of traditional medicine throughout Nigeria is done by the Yoruba tribe from the southwest and reports that almost all shops are run by women and that the tradition of fetish selling is handed down within a family (see also Awoyemi 2014). The traditional healer has the prerogative in terms of indicating which birds, herbs or

minerals are needed and how they are to be utilized and sends his/her client to relevant traders of wildlife parts (Nikolaus 2001).

Overall, the examples of belief-based practices from different parts of Africa appear to have a dichotomy of use which are for treating ailments and for magico-religious purposes. Further, some instances of belief-based use of wildlife show a relationship between morphological, behavioral characteristics and choice for belief-based use (Alves *et al.* 2020). For example, it is believed that the long-life span of a vulture can confer long life on a human (Grayson 2000), another reason for consuming vultures for belief-based use.

### II.3. Vultures

Vultures are large obligate scavengers that feed on the carcass of vertebrates (Mundy *et al.* 1992). Two main types of vultures exist: Old World vultures of the Accipitridae family that inhabit Europe, Africa and Asia, and New World vultures of the Cathartidae family, inhabiting North and South America (Del Hoyo *et al.* 1992). Old World vultures are under threat globally apart from Western Europe where most species are recovering (Ogada *et al.* 2011; Botha *et al.* 2017). Nine of all 23 vulture species (39%) in the world are classified by the IUCN as Critically Endangered, with 3 species Endangered, 4 Near Threatened and 7 Least Concern (Buechley and Şekercioğlu 2016). The most rapid vulture population declines have taken place in Asia and Africa (Ogada *et al.* 2011). In India, populations of *Gyps* vultures in a national park have fallen by over 95% between 1988 and 1999 (Prakash 1999). In Africa, in three generations, the bearded vulture's (*Gypaetus barbatus*) population fell by 70% while seven other species fell by 80% or greater (Buechley and Şekercioğlu 2016). Consequently, four African vulture species were listed as Critically Endangered in 2015 (Buechley and Şekercioğlu 2016). Eleven vulture species are found in Africa with 6 restricted to the continent and the remaining occurring elsewhere in Eurasia

(BirdLife International 2021b). Seven vulture species found in the continent are threatened with extinction (BirdLife International 2021b). There are many different threats facing vultures with poisoning and/or human persecution appearing in the list of almost all declining species (Ogada *et al.* 2011). The most significant threats for African vultures are poisoning and trade for belief-based use which combined accounted for 90% of reported deaths (Ogada *et al.* 2016).

### II.3.1. Biology

Fifteen species of Old World vultures out of the total of 16 (Table 2) have been prioritized by the CMS excluding the Palm-nut Vulture (*Gypohierax angolensis*) which is not a migrant and obligate scavenger (it is primarily frugivorous), a reason behind threats other species encounter (especially poisoning) (Botha *et al.* 2017). Technically, most of the other vultures are also not (complete) migrants, apart from Egyptian vulture (*Neophron percnopterus*). They were merely categorized as such under the CMS. The 15 vulture species are medium-sized to large raptors, weighing between 2-10kg and are energy efficient soaring birds (Botha *et al.* 2017). Other adaptive features are broad wings, powerful beaks, and bald heads (Buechley and Şekercioğlu 2016). Vultures eat carcasses of large mammals, with parts such as flesh, offal, intestines, and bones which can be stored in the crop in one meal to serve for several days (Mundy *et al.* 1992). They build their nests on cliffs or trees and some species breed in colonies (Mundy *et al.* 1992).

The *Gyps* genus comprises 8 of these 15 species, while the remaining 7 species are each in their own genus (Botha *et al.* 2017). *Gyps* vultures are characteristically common and many, known erstwhile for representing most of the individual vultures in Africa and Asia (Botha *et al.* 2017). Five of the other 7 species closely resemble *Gyps* in their size, structure, and ecology and together these 13 species have their own taxonomic group (Botha *et al.* 2017). The last two, Egyptian and

Bearded Vulture are relatively different from the other vulture species (and each other) but being obligate scavengers, they are also classified as vultures (Botha *et al.* 2017).

**Table 1. Old World vulture species prioritized by the CMS. Source: Botha *et al*. (2017)**

| Species | Range | Global Threat Level (Red List Category)[1] | Population Estimates |
|---|---|---|---|
| Bearded Vulture *Gypaetus barbatus* | Europe, Asia, Africa | NT | 2,000-10,000 |
| Egyptian Vulture *Neophron percnopterus* | Europe, Asia, Africa | EN | 218,000-570,000 |
| Red-headed Vulture *Sarcogyps calvus* | Asia | CR | 3,500-15,000 |
| White-headed Vulture *Trigonoceps occipitalis* | Africa | CR | 1,893 (Murn *et al*. 2016) |
| Hooded Vulture *Necrosyrtes monachus* | Africa | CR | 197,000 |
| Himalayan Griffon *Gyps himalayensis* | Asia | NT | 66,000-334,000 |
| White-rumped Vulture *Gyps bengalensis* | Asia | CR | 8,000 |
| White-backed Vulture *Gyps africanus* | Africa, (Europe) | CR | 270,000 |
| Indian Vulture *Gyps indicus* | Asia | CR | 12,000 |
| Slender-billed Vulture *Gyps tenuirostris* | Asia | CR | 1,500-3,750 |
| Cape Vulture *Gyps coprotheres* | Africa | EN | 4,700 pairs |
| Rüppell's Vulture *Gyps rueppelli* | Africa, (Europe) | CR | 22,000 |
| Griffon Vulture *Gyps fulvus* | Europe, Asia, Africa | LC | 80,000-120,000 |
| Cinereous Vulture *Aegypius monachus* | Europe, Asia, (Africa) | NT | 15,600-21,000 |
| Lappet-faced Vulture *Torgos tracheliotos* | Africa, Asia | EN | 8,500 |

[1]CR = Critically Endangered; EN = Endangered; NT = Near Threatened; LC = Least Concern.



### II.3.2. Threats

Old World vultures have been described as the most threatened group of birds globally, with poisoning, persecution, increasing food shortage, habitat destruction, and collision with energy infrastructure identified as major threats (Buechley and Şekercioğlu 2016). The CMS Vulture

Multi-Species Action Plan identified the most significant threats to Old World vultures (Botha *et al.* 2017); Table 3.

**Table 2. Threats to Old World Vultures**

| Threat Name | Description of Threat | References |
|---|---|---|
| 1. Poisoning | Poisoning of vultures are of two types, unintentional and targeted poisoning | (Botha *et al*. 2017), (Ogada *et al*. 2011), (Saidu and Buij 2013) |
| 2. Mortality caused by energy infrastructure | Mortality on powerlines is characteristically related to two types of accidents, namely, electrocution and collision | (Gangoso and Palacios 2002), (Botha *et al*. 2017), (Angelov *et al*. 2013), (Boshoff *et al*. 2011) |
| 3. Decline of food availability | Because of the nature of vultures being obligate scavengers, they are vulnerable to decreasing levels of carcass availability | (Margalida and Colomer 2012), (Botha *et al*. 2017) |
| 4. Habitat destruction | Habitat change may lead to food shortages or other ecological implications | (Botha *et al*. 2017), (Zuberogoitia *et al*. 2008), (Thiollay 2006) |

**II.3.2.1. Poisoning**

Among the threats to vultures, poisoning is particularly insidious and has contributed to a precipitous fall in vulture populations in the last 30 years in both South Asia and Africa (Botha *et al.* 2017). Poisoning of wildlife has been executed using organochlorines, organophosphates, carbamates and pyrethroids (Botha *et al.* 2017). As regards vultures, two main types of poisoning exist: unintentional (secondary) poisoning, where vultures are not meant to be killed, and targeted poisoning which involves deliberate killing of vultures (Botha *et al.* 2017).

First, unintentional poisoning happens when vultures feed on poisoned baits made for other animals or when they eat carcasses of animals killed with poison (Botha *et al.* 2017). Environmental pollution from chemical waste can poison food or water for vultures thus bringing about their unintentional killing (Botha *et al.* 2017). Human-wildlife conflict is an example of a source of unintentional poisoning. For instance, farmers who want to control pests who raid their crops (e.g., elephant) and livestock herders bent on killing predators preying on their livestock, sometimes use poison (Ogada *et al.* 2011; Botha *et al.* 2017). The use of pesticides in poison baits is illegal in most of the CMS Range States, although enforcement is poor most of the time (Botha *et al.* 2017). Other sources of intentional poisoning include problem animal control, veterinary medicines, lead poisoning and bioaccumulation (Botha *et al.* 2017).

Second, for targeted poisoning, belief-based use of vultures and their trade is partly possible through the rising use of pesticides to kill vultures (Botha *et al.* 2017). For example, between September 2019 and March 2020, over 2000 Critically Endangered hooded vultures were killed in Guinea-Bissau (Henrique *et al.* 2020). These vultures were deliberately poisoned to get their heads for belief-based use (Henrique *et al.* 2020). A carbamate pesticide was confirmed as instrumental in the killing of these vultures (Henrique *et al.* 2020). In northern Nigeria, agricultural chemicals were reported as one of the agents used in killing the vultures sold in surveyed markets. Other agents are tobacco powder, shotguns, and traps (Saidu and Buij 2013). Belief-based use of wildlife is particularly widespread in Africa with documented accounts especially in West Africa and, to a lesser but still important, degree in southern Africa, and rising instances in East Africa (Botha *et al.* 2017).

Vultures killed through poisoning or other means are traded for belief-based use in southwest Nigeria and sourced from the north and neighboring countries including Niger, Benin, Sudan, Cameroun, and Chad (Saidu and Buij 2013; Awoyemi 2014). Occasionally, Hausa traders come from the north to Ibadan in the southwest to offload vultures or their parts for sale to traders from different parts of the southwest who will then return to their towns or cities to sell. Ibadan is therefore a clearing house for vultures or their parts in southwest Nigeria (R. Alase, pers. comm; see also Nikolaus 2011). There is a trade chain that makes up the entire process (Figure 4).

Human poisoning or shooting of vulture

Vulture purchased by a bulk trader of vulture parts (wholesaler) or a retailer directly

Vultures and/or their parts from northern Nigeria sold to retailers in Ibadan (south-western Nigeria)

Retailers take vultures and/or their parts to open markets in their towns to sell

Buyers buy vultures and/or their parts for use

End users get vulture parts and take to herbalists.

**Figure 3. Flow diagram showing trade chain for trade of vulture parts for traditional medicine in southwestern Nigeria**



Another kind of targeted poisoning is sentinel poisoning which involves the deliberate poisoning of carcasses of animals such as elephants killed by poachers to prevent vultures from bringing attention to the crime scene, a practice which may not be connected to any use of the vultures

themselves (Buechley and Şekercioğlu 2016; UNEP-WCMC 2021). Records from the African wildlife poisoning database show that sentinel poisoning is far more prevalent in southern and eastern Africa than it is in West Africa, although the database is thought to be incomplete or biased towards regions where poisoning incidents have a greater possibility of being documented (Santangeli *et al.* 2019).

### II.3.3. Global and regional vulture conservation efforts

Vultures are a great conservation challenge for the 21st century (Perrig *et al.* 2019). Catastrophic declines of vultures in South Asia (due to unintentional poisoning from the veterinary diclofenac) since the 1990s, where species such as the white-rumped vulture declined by 99.9% in less than 20 years, led to active collaboration between scientists, regional and international conservation organizations, government, donors, and the media to save vultures from extinction (Ogada *et al.* 2011; Bowden 2017). An instrumental platform to achieving this ambition was the creation of the Saving Asia's Vultures from Extinction (SAVE), a consortium of 20 partners (now 24), established in February 2011 (Bowden 2017). SAVE partners work "together to implement agreed priority actions listed in the annually reviewed blueprint for the recovery of Asia's globally threatened vultures" (SAVE undated), and its model has been recommended for possible adaptation to solve Africa's own vulture crisis (Bowden 2017).

In Europe, there has been a classical demonstration that vulture conservation is possible on a large scale (Safford *et al.* 2019). For instance, griffon vulture populations in Western Europe have increased by more than 200% in 12 years, with Spain alone holding over 20,000 pairs, and cinereous vulture populations increasing by 50% in 20 years with successful reintroductions of bearded vulture to parts of its former range, particularly Andalucía, Spain (Safford *et al.* 2019). These breakthroughs are mainly because of proven and evidence-based conservation approaches,

effective legislation, and availability of significant funding to carry out projects (approximately 80 million Euro was put into vulture conservation in 15 years) (Safford *et al.* 2019).

For Africa, scientists agree that there is a great difference between Asia and Africa's vulture crisis because Africa's significant threats are many and varying by region (Ogada *et al.* 2011). Vulture conservation efforts in the continent have hitherto been relatively few (Ogada *et al.* 2011). However, this seems likely to change as broad scale international engagement of all CMS Range States with their respective governments has been instigated through the Vulture MsAP under the CMS (Safford *et al.* 2019). The MsAP is meant to provide an extensive conservation action plan that covers the Range States of all 15 Old World vulture migrants (Table 1) and to facilitate international collaboration towards the reversal of vulture declines to acceptable levels by 2029 (Botha *et al.* 2017). The plan is an outcome of considerable discussion with parties and scientists and has the following aims: "rapidly halt current population declines in all species covered by the Vulture MsAP; reverse recent population trends to bring the conservation status of each species back to a favorable level; and provide conservation management guidelines applicable to all Range States covered by the Vulture MsAP" (Botha *et al.* 2017: 9). The 12-year vulture MsAP is made up of 125 actions under 12 objectives which focus on research and monitoring, policy and legislation, education and awareness and direct conservation action (Botha *et al.* 2017). Efforts are ongoing to domesticate the MsAP with national action plans such as has been done by Greece, South Africa, and the Balearic Islands (Safford *et al.* 2019) and current efforts by the newly formed West Africa Working Group of the IUCN Species Survival Commission Vulture Specialist Group is working on a conservation plan for vultures in the sub-region. During the 18th meeting of the Conference of the Parties to CITES in 2019, the West African countries Burkina Faso, Niger and Senegal submitted a document to CITES titled "West African Vulture Trade and Conservation

Management" (CITES 2019). The countries indicated, in submitting the document, that an investigation of the conservation impact of the West African vulture trade needs further consideration within CITES (CITES 2019). Among the directives to the CITES secretariat was: "The CITES Secretariat shall liaise with the Secretariat of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) to assist in the implementation of the Vulture Multispecies Action Plan, subject to the availability of resources, including sharing information based on the work of the Animals Committee".

However, there is need for more concrete action on the ground in West Africa. The Nigerian Conservation Foundation is one such organization in Nigeria working with traditional healers on plant-based alternatives to vulture body parts (BirdLife International 2020). Overall, in the best-case scenario, it is imaginable that to reverse population declines of vultures across Africa, where the threats seem to be more intractable, it will take several years (Safford *et al.* 2019).

## II.4. Theoretical approaches to human-wildlife interactions

Because of the inter-disciplinary nature of human-wildlife interactions, social science theories are increasingly recognized as necessary approaches to explain and solve problems associated with humans and their interactions with wildlife (Mascia *et al.* 2003; Lischka *et al.* 2018). Scientists agree that conservation is primarily about human behavior and therefore the social sciences must become the principal discipline for conservation science and practice (Mascia *et al.* 2003). However, the mainstreaming of social science into conservation biology and practice is weak and the discipline of conservation social science is still emerging (Bennett *et al.* 2017a; Manfredo *et al.* 2020; Dayer *et al.* 2020). The social sciences are yet to attain a similar stature of popularity in conservation science, practitioner and policy circles compared to the natural sciences (Bennett *et al.* 2017b).

Although relatively few social science theories have been used in conservation science (St John *et al.* 2010), there are some that have utility to explain human wildlife interactions: those that look at how wildlife is illegally harvested (Eliason 1999; Eliason 2012) and wildlife use and demand reduction possibilities (Greenfield and Verıssimo 2019; Doughty *et al.* 2021). Overall, these theories are a rich basis or source of how to manage human related wildlife challenges. The two most used theories in conservation will be considered, especially those that focus on behavioral change interventions, with a highlight of their main strengths and limitations.

### II.4.1. Theory of planned behavior

The Theory of Planned Behavior (TPB) which is an extension of the Theory of Reasoned Action (Fishbein and Ajzen 1975; Ajzen 1991) has been the most widespread model used by social scientists in understanding and managing human behavior for decades (St John *et al.* 2010; Sniehotta *et al.* 2014; Yuriev *et al.* 2020). The main thesis of this theory is that an individual performs a behavior based on intention, and the higher this intention, the stronger the likelihood for engaging in the behavior (Ajzen 1991). The TPB covers three kinds of possibilities according to human actions: beliefs about the likely result of the behavior (behavioral beliefs), beliefs about the prescriptive expectations of others (normative beliefs) and beliefs about factors that may advance or hold back performance of the behavior (control beliefs) (Figure 3; Hrubes *et al*. 2001). In each of their combinations, behavioral beliefs produce advantageous or disadvantageous attitudes toward the behavior; normative beliefs give rise to perceived social compulsion or subjective norm and control beliefs result in perceived behavioral control, the adjudged effortlessness or hardship of accomplishing the behavior (Hrubes *et al*. 2001). Altogether, attitude toward the behavior, subjective norm, and perception of behavioral control influence the shaping of a behavioral intention (Hrubes *et al*. 2001). As a rule, the more favorable the attitude and

subjective norm, and the higher the level of perceived control, the more effective should be the person's intention to execute the related behavior (Hrubes *et al*. 2001).

Such social-psychological models like the TPB have been used in conservation science. For example, Beedell and Rehman (2000) analyzed data from a survey of 100 Bedfordshire farmers to find the drivers of behavior and to understand farmers' attitudes. Results reveal that the more environmentally conscious farmer members of the Farming and Wildlife Advisory Group (FWAG) were less driven by farm management concerns and more by conservation impacts of their behavior than less environmentally conscious farmers (Beedell and Rehman 2000). The FWAG farmers' subjective norm elicited from referent organizations, especially FWAG and the country council, was higher than for the other farmers (Beedell and Rehman 2000).

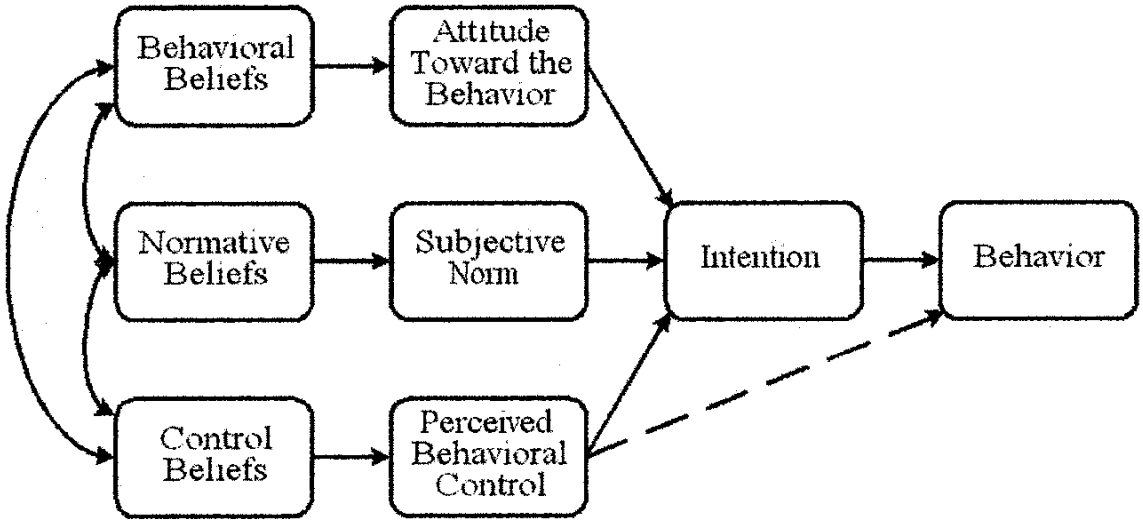



**Figure 4. The Theory of Planned Behavior (Source: Hrubes et al. 2001)**

In a survey of 124 farmers in Dera Ismail Khan district in Pakistan, the TPB was applied, revealing that: 1) farmers' willingness to plant trees on their farms is based on attitudes towards the favorable

and unfavorable aspects of growing trees, and on 2) subjective norms that encourage and discourage tree growing in the farm (Zubair and Garforth 2006). The significant predictors of tree growing in the farm were availableness of barren land, absence of markets, absence of nurseries and destruction by animals and humans (Zubair and Garforth 2006). Beyond this conventional use of TPB, because of its flexible model, the theory can be extended to include additional variables such as moral norm (Lopez-Mosquera *et al.* 2014), "awareness of the consequences and the need" (Macovei 2015) and others, to increase the explanatory power of the original model. For example, the influence on the willingness to pay by moral obligation and the variables of the TPB of 190 park visitors for conservation purposes in Spain was determined (Lopez-Mosquera *et al.* 2014). Results reveal that moral norm was the main variable in predicting behavioral intention, in turn with attitude (Lopez-Mosquera *et al.* 2014). The proportion of explained variance reveal that the addition of moral norm improves the explanatory strength of the original model of the TPB by 32-40% (Lopez-Mosquera *et al.* 2014). By way of definition, the moral norm is the perception of an individual's moral rightness or wrongness of a particular behavior (Ajzen 1991). Another study was carried out to discover the underlying influencers of farmers' intention to conserve biodiversity, whereby the TPB was applied to understand the intention of 274 Iranian farmers in relation to on-farm biodiversity conservation (Maleksaeidi and Keshavarz 2019). Similarly, in this study, the theoretical model of the TPB was extended to improve its predictive power and variables such as knowledge, moral norm and perceived problems of increased agriculture were integrated into the model (Maleksaeidi and Keshavarz 2019). Results revealed farmers have an average level of knowledge about biodiversity conservation approaches and their value, and an advantageous attitude towards biodiversity conservation (Maleksaeidi and Keshavarz 2019). However, their perceived behavioral control of practicing biodiversity conservation is inadequate (Maleksaeidi

and Keshavarz 2019). Further, results show that attitude, perceived problems of increased agriculture, knowledge, social norms, and moral norms are the factors of highest importance influencing farmers behavioral intentions towards biodiversity conservation (Maleksaeidi and Keshavarz 2019).

Overall, these highlights indicate that TPB has its strengths and limitations, as outlined by Yuriev *et al.* (2020). First for strengths: 1) researchers can identify beliefs about targeted behaviors and consecutively evaluate their significance for a specific population. To achieve this, the following method is used: direct predictors (attitude, subjective norm, and perceived behavioral control; Figure 3) are determined through a set of predetermined and authenticated statements (Ajzen 2002). Following this, indirect predictors (behavioral, normative and control beliefs; Figure 3) are evaluated using a qualitative investigation of elements that shape a behavior as beliefs differ depending on the given situation (Ajzen 2015). To assess the significance of each belief that has been identified as associated with a given behavior, statistical analysis should be employed. These analyses normally have three components: evaluation of factors that shape behavior; assessment of direct prognosticators of intention; and evaluation of indirect prognosticators (beliefs) for important direct prognosticators (Ajzen 2002). The foregoing methodological steps permit exploration of similar behaviors in different contexts and enable results to be easily interpreted and compared. 2) TPB is thought to be one of the most efficacious models for building behavioral change interventions. Riebl *et al.* (2015) examined the outcomes of TPB-based interventions aimed at harmful feeding habits in youth and confirmed that all interventions had advantageous results in terms of changing unhealthy behaviors. However, there are few accounts of interventions made with the TPB framework with a goal to heighten the probability of pro-environmental behaviors. Timm and Deal (2016) report the only example of such an intervention in testing some

procedures for transforming energy behaviors in college campuses within Illinois. They report significant energy savings of up to 50% but recorded a non-trivial positive longitudinal impact of this intervention. 3) The theory is flexible and can be extended to accommodate other variables to strengthen its predictive or explanatory capacities. TPB can incorporate additional variables for the application of an extended theory such as past behavior (Richetin *et al.* 2012), moral norm (Wan *et al.* 2017), and self-identity (Mannetti *et al.* 2004).

Second, for limitations: 1) The theory is only useful for targeting one behavior on occasion. While it is advantageous to spot certain factors that impact an action due to specific beneficial (e.g., exercise, recycling, energy-saving) or deleterious (e.g., drug abuse, smoking, alcohol consumption) behaviors, the use of TPB misses the complexity of broader issues. For example, organizational environmental achievement relies on diverse behaviors of a variety of workers, and single TPB-based research can rarely produce an intervention that will accommodate the multiplicity of workers and their roles. 2) The result arising from the TPB framework is rarely generalized because survey instruments are bespoke for the target population. This situation requires the crafting of new questionnaires as respondents from various cultures, societies, and organizations are usually impacted by different types of beliefs. 3) Lack of certainty of the legitimacy of the theory's central presuppositions, viz the thesis that beliefs foretell only intention, and not behavior. Certain research efforts have shown that beliefs might also extend beyond intention (Araujo-Soares *et al.* 2013; Conner *et al.* 2013) and the TPB's actual direct and indirect variables do not comprise the complexity that occasionally shape behavior, as well as emotions, affect, regret and socio-economic status. 4) Like other behavioral theories, TPB-based research mostly utilizes self-reported estimates of real behavior, which may result in biased reports. Lack of validated-based evaluations of behaviors could be among the rationales for an intention-

behavior difference, i.e., the gap between participants' intentions to behave in a particular manner and the real behavior (Sniehetta *et al.* 2005; Rhodes and Bruijn, 2013).

### II.4.2. Social marketing theory

The source of the term *social marketing* can be linked back to the seminal article of Kotler and Zaltman (1971) in the *Journal of Marketing* and entitled "Social Marketing: An Approach to Planned Social Change" (Andreasen 1994). However, the very first formal definition of social marketing by Kotler and Zaltman had shortfalls and therefore evolved into a more practical definition proposed by Andreasen (1994:110) as: "… the adaptation of commercial marketing technologies to programs designed to influence the voluntary behavior of target audiences to improve their personal welfare and that of the society of which they are a part". To be categorized as social marketing, a project must: 1) Involve the application of commercial marketing technology, 2) have as its target to influence voluntary behavior, and 3) fundamentally aim to benefit others or society at large rather than the marketing organization itself (Andreasen 1994). Further, Andreasen (2002) proposes six benchmarks for identifying social marketing: 1) Behavior change is the standard for designing and evaluating interventions, 2) projects understand their audience through research from the formative to actual implementation of interventions, 3) projects segment audiences to maximize resources, 4) influencing behavior should ensure attractiveness and motivation by audiences as core aspects of project strategy, 5) the strategy uses the traditional marketing mix (i.e. the four Ps), and 6) the project should carefully take note of the competition faced by the desired behavior. Based on all these standards, there is increasing use of social marketing in conservation even though the health sector has widely applied this theory (Cheng *et al.* 2011). For example, DeWan *et al.* (2013) reports the application of social marketing in the protection of the Sichuan golden snub-nosed monkey (*Rhinopithecus roxellana*) in the Yuhe

Nature Reserve in China in 2008. The campaign aimed at inspiring communities to conserve forests in the reserve and use fuel-efficient stoves. Results reveal a marked increase in knowledge, attitudes, and interpersonal communication pre and post campaign (16 – 49 percentage points). Within 1 year and 2.5 years after the intervention, results show 28.0% and 43.1%, respectively, adoption of the fuel-efficient stove technology. Initial investigations suggest that the adoption of fuel-efficient stoves caused a 23.7% shrinkage in the extent of newly deforested areas where the technology had been taken up by more than half the surrounding community (DeWan *et al.* 2013). In Peru's Cajamarca San Ignacio Province, Rare and Cáritas-Peru spear-headed a social marketing 'Pride' campaign aimed at building trust and speeding-up the process of institution-building and endorsement of Reciprocal Water Agreements among upstream and downstream water users (Martinez *et al.* 2013). The result of this campaign was the signing of 25 Reciprocal Water Agreement contracts, acquiring the protection of over 360 hectares of forest (Martinez *et al.* 2013). Andriamalala *et al.* (2013)'s findings demonstrate the effectiveness of social marketing for engendering sustainable behavior in traditional fishing communities of southwest Madagascar when integrated with good regulatory mechanisms. Accordingly, Kennedy (2010) argues that environmental regulation may be more effective if it employs strategies that incorporate community based social marketing. Even with all these, there is a surprising gap in social marketing skills in the conservation sector (Robinson *et al.* 2019). In a survey of 322 conservationists from 71 countries, findings suggest there is a significant gap in social marketing skills with only 16.1% of respondents stating their skill level to be advanced (Robinson *et al.* 2019).

Robinson and colleagues' survey showed a high demand for training in social marketing skills. This is understandable given the strengths of the social marketing theory, which are 1) the theory's

strategy of going beyond building awareness and influencing attitudes to focus on a particular behavioral goal as the ultimate benchmark, 2) the rigor of the theory's process in integrating other behavioral science tools in the theory of change of overarching goals to improve effectiveness and monitoring and evaluation capacities, and 3) its transtheoretical status gives it flexibility to be used in a wide variety of social domains (Corner and Randall 2011). However, Corner and Randall (2011) have argued that the social marketing theory has its limitations, and its utility is not applicable in all situations. First, tailoring a message to an audience's values, beliefs and preferences does not always work or is practicable (Corner and Randall 2011). This is especially if these variables are in opposition to the goal of the campaign, thereby placing significant limitations on how the message can be crafted to suit the audience (Corner and Randall 2011). Second, the assumption in social marketing that smooth, low-impact changes in pro-environmental behavior gives rise to acquisition of more ambitious pro-environmental behaviors is not fool-proof (Corner and Randall 2011). This is because evidence for the presence of behavioral spillover is very restricted (Corner and Randall 2011). Third, audience segmentation spotlights rather than reconciles individual differences (Corner and Randall 2011). For instance, segmentation of people might be self-fulfilling in the sense that a label would rule that a person should behave in particular ways even though these behaviors are not beneficial in the long term (Corner and Randall 2011). Finally, social marketing incorporates a political rationality which may not be sustainable (Corner and Randall 2011). For example, the strategies used by policy makers in addressing climate change are essentially biased towards keeping the existing socio-economic and political conditions (Corner and Randall 2011). Therefore, tools are needed that are not constrained by the dominant paradigm (Corner and Randall 2011).

Although both the Theory of Planned Behavior and Social Marketing Theory are important for behavioral intervention programs in general, they do not have utility for cultural embeddedness in terms of explaining how cultural traits are transmitted in local communities. They are therefore unable to provide culturally bespoke pathways for behavioral intervention programs. First, it is not clear if the TPB questionnaire format for assessing the theory's main constructs in a sample is translatable to the local language (e.g., the seven-point bipolar adjective scales) (Ajzen 2013) and that local traders will be amenable to reading and making written evaluations. Second, the TPB does not state the kind of behavioral intervention that would be most effective, especially as relates to a cultural context, which concerns this study (Ajzen 2019). Also, the Social Marketing Theory tells us *what* in terms of tailoring a message to embody an individual's values, beliefs and preferences but lacks information on *who* should best convey these framed messages. These limitations led to preference for the Cultural Transmission Theory for a theoretical framework for this study.

### II.4.3. Theoretical framework

Cultural transmission is defined by Cavalli-Sforza *et al*. (1982:19) as "…the process of acquisition of behaviors, attitudes, or technologies through imprinting, conditioning, imitation, active teaching and learning, or combinations of these". Similarly, Bisin and Verdier (2008) define cultural transmission as the passing on of preferences, beliefs, and behavioral norms as an outcome of inter- and intra-generational social interactions. Cultural transmission is a multi-disciplinary theory that is studied in evolutionary anthropology, sociology, social psychology, economics, and evolutionary biology (Bisin and Verdier 2008). Its foundations stem from the pioneering study of Cavalli-Sforza and Feldman (1981). Others, including Boyd and Richerson (1985) and Coleman

(1988) show the application of evolutionary biology to cultural transmission and the empirical research on cultural socialization in American schools, respectively.

Cultural transmission is characterized by the conservativeness or flexibility of a cultural trait, which is largely influenced by mechanisms of cultural transmission (Guglielmino *et al.* 1995). For instance, cultural traits are highly conservative when parents pass them on to their offspring (Table 1; Guglielmino *et al.* 1995). The impact of parents and extended family members on children occur when they are young and easier to influence (Guglielmino *et al.* 1995). However, the action of a homogenous social group in terms of pressurizing individuals one at a time (e.g., during an initiation ceremony) is even more conservative (Guglielmino *et al.* 1995). Characteristic of these mechanisms of transmission is that change, or innovation, have a small possibility of acceptance (Guglielmino *et al.* 1995). It is, however, possible for innovation to impact an entire group through contact with unrelated individuals, a mechanism known as "horizontal" transmission (Guglielmino *et al.* 1995). These transmitters of innovation usually come from outside social groups and where they involve teachers, powerful authority or high prestige individuals, the mechanism is known as "one-to-many" or "teacher/leader" directed (Guglielmino *et al.* 1995). Where knowledge is passed on through vertical transmission, innovations would diffuse slowly (Reyes-Garcia *et al.* 2009). In contrast, horizontal transmission might result in fast spread of new cultural traits if contact with transmitters is frequent (Reyes-Garcia *et al.* 2009).

**Table 3. Major mechanisms of sociocultural transmission and theoretical expectation of their dynamics. Source: Guglielmino *et al*. (1995)**

| Type of mechanism | Description | Culture change | Comments |
|---|---|---|---|
| Vertical | Parent-to-child or through family | Unlikely and slow | Conservative |
| Group pressure | Concerted effort of many (older) people on each person | Very slow | Highly conservative |
| Horizontal | Person-person (unrelated) | Can be rapid | Frequent route of innovation |
| One-to-many | Teacher or leader to group | Most rapid | Prevalent route of innovation |

A more nuanced description of the mechanisms of cultural transmission compared to that shown in Table 1 above, is given by Cavalli-Sforza *et al*. (1982), which are: vertical, horizontal, and oblique. Berry and Georgas (2008) describe horizontal cultural transmission to connote learning from one's peers (in primary and secondary groups) as one develops from childhood to adulthood. Oblique cultural transmission describes learning from other adults (as well as individuals of one's extended family) and social institutions (Berry and Georgas 2008). Further, when cultural transmission occurs in the primary culture of an individual, enculturation and socialization are the descriptive words (Berry and Georgas 2008). Enculturation is how an individual surrounded by their culture learns what is deemed important by that culture through a process that is not necessarily intentional or didactic and learning is without any teaching (Berry and Georgas 2008). The agents of this process comprise parents, other adults, and peers, all of which can influence the developing individual (Berry and Georgas 2008). The outcome of successful enculturation is an individual who has acquired competence in the culture, its language, rituals, values etc.

Socialization on the other hand has its roots from sociology and social psychology and refers to intentional shaping by way of teaching the person (Berry and Georgas 2008).

Going deeper, cultural transmission could involve genetically similar people inhabiting similar environments that show distinct behavioral patterns because they have a variety of culturally acquired beliefs and values (Henrich and Boyd 1998). Such cultural transmission has as its foundation, sophisticated, acquired psychological processes that have probably been configured by natural selection (Henrich and Boyd 1998). Understanding these evolved psychological processes is important because they are responsible for which beliefs and values proliferate and continue among humans (Henrich and Boyd 1998). Boyd and Richerson (1996) revealed through a simple model of evolution that the propensity to pick up the most prevalent behavior shown in a society was adaptive in an environment that varied across space because such propensity raises the likelihood of acquiring adaptive beliefs and values. Such cultural transmission under the conditions of cultural evolutionary thought is referred to as *conformist transmission* (also known as biased transmission), connoting the idea that individuals have the tendency to acquire the cultural traits that are most common in the population (Schönpflug 2008). Conversely, *unbiased transmission* implies not just the imitation of any one but as well as the example of the parents who do not present adaptive traits all the time in their transmission efforts (Schönpflug 2008). If it is unbiased transmission, the difference of the trait in the following generation will be mostly absent (Schönpflug 2008). While, if it is a conformist transmission, it will give greater recurrences of the adaptive trait in the following generation (Schönpflug 2008). Conformist transmission gives a directional force that has the propensity to form and perpetuate cultural norms (Schönpflug 2008).

From another perspective, cultural transmission is argued to be made up of two components (cognitive and emotional) (Norenzayan and Atran 2004). The cognitive part is shaped by the

contents of the transmission which are beliefs, folktales, and myths. Researchers evaluate the proof that cultural beliefs utilize similar cognitive functioning based on intuitive ontologies and domain-specific theories of physics, biology, and mind (Norenzayan and Atran 2004). On the other hand, non-natural religious beliefs give rise to deep epistemological and emotional fidelity (Norenzayan and Atran 2004). Emotionally toned contents of cultural transmission have a greater probability of being transferred, just as they have a higher chance of being memorable (Norenzayan and Atran 2004). Although, this greater probability of transmission might also be as a result of religious beliefs containing minimally counterintuitive concepts (Norenzayan and Atran 2004).

Other broader influences on cultural transmission's process, direction, and outcomes are the *individuals* (agents) who take part in the transmission action, their particular *relationships*, the *issues* (contents) that are transferred, and the *cultural context* in which transference happens (Trommsdorff 2008).

The agents (i.e., parents and their children) that take part in transmission shape the action and results of how traits are transmitted based on their choices, beliefs, competencies, and cultural knowledge (Trommsdorff 2008). The development of agents impacts their goal and means of cultural transmission of values, and the receipt of these values may evolve when children become adults and parents, thus shaping the transmission of values (Trommsdorff 2008).

The nature and quality of relationships of individuals that are involved in cultural transmission shapes its process, outcome, continuity, and selectivity (Trommsdorff 2008). Such qualities as emotional proximity, or normative necessity, consonance, or dissension, hierarchical or vertical structure, shared experiences and interdependence or independence influence relationships and therefore the mechanism of cultural transmission (Trommsdorff 2008). Cultural transmission is

also thought to be based on the contents of transmission such as traditional values, cultural knowledge, and practices (Trommsdorff 2008).

Lastly, cultural transmission happens within a broader context which varies and therefore shapes the aforementioned factors (i.e., persons, relationships, and contents) (Trommsdorff 2008). For example, the socioeconomic and cultural context, as well as socioeconomic and cultural change or persistence may engender or restrict intergenerational transmission (Trommsdorff 2008). Further, evolving cultural contexts can even elicit a turnaround in the route of cultural transmission (Trommsdorff 2008). For instance, adolescents' acquisition of changing cultural values can instigate a change in the route of transmission, thus bringing about transformations in the values, beliefs, and behavior of their parents (Trommsdorff 2008).

One real-life example related to this study that is typical of cultural transmission, especially its conservation and innovation, is Chinese traditional medicine and its evolution. In its conservation, it has been through vertical transmission i.e., parent to child or through a family line of doctors (Guglielmino *et al.* 1995; Marié 2011). In contrast, innovations of the herbal literature have been through horizontal transmissions including person-to-person (unrelated) or one-to-many (teacher or leader to group). For example, according to the Divine Plowman's Herbal, rhino horn tastes bitter, has cold properties, and is indicated for all intoxications and delirium, but subsequent herbals have taken new applications and refined the medicinal value of rhino horn (But *et al*. 1990). So how did the Chinese medical system endure and develop over the long term, while keeping a remarkable level of epistemological continuity (Marié 2011)? This was made possible by cultural transmission through a whole range of filiations, lineages, and classical schools that, regardless of intermittent lack of agreement on certain points, demonstrated correspondence and consistency

because they were based on the same founding texts and the theoretical construction stemming from these texts (Marié 2011).

In a study by Truong *et al*. (2016) of 608 surveyed males in Vietnam, a country identified as among the world's largest recipients of illicit rhino horn, they discovered that television (TV) and radio (34.08%) and the Internet (25.71%) are the two most common channels through which identified consumers obtain rhino horn information. Approximately 98% of Vietnamese households owned a TV (BBG 2013) and 50% of the population had access to the Internet (World Bank 2017). The curative powers of rhino horn have been disseminated through online newspapers and magazines which have claimed for example that "rhino horn with wine is the alcoholic drink of millionaires" and that "rhino horn is a miracle medicine" (Smith 2015). The type of mechanism of cultural transmission in this case can be termed "one-to-many" and is the most rapid in terms of innovation (Guglielmino *et al*. 1995). The researchers found that channels such as those of vertical transmission (family members and relatives) were reported by few respondents only.

Thus, understanding cultural transmission in relevant sectors of society (in this case, illegal trade of vulture parts), including mechanisms which influence 'conservation' or openness to 'change', can illuminate opportunities for influencing culture. One example is the use of Yao Ming, a household name basketball player in China, in numerous WildAid campaigns against shark fin consumption. In 2016, a follow-up survey of Chinese residents was done to determine changes in attitudes and awareness toward shark protection (WildAid 2018). The survey revealed that 93% of participants had not eaten shark fin in the past 6 years, and 98.8% of observers of WildAid campaign messages concurred that the messages heightened their awareness about the conservation of sharks and the need to avoid shark fin exploitation (WildAid 2018).

## II.5. Conclusion

This chapter showed that IWT has persisted historically and today demand is increasing with the trade now using online platforms and that belief-based practice, a driver of IWT, has a dichotomy of use i.e., for medicinal and magico-religious purposes. It was shown why Old World vultures need particular attention given their multiple threats. Following, the utility of social science theories in explaining human-wildlife interactions was highlighted.

Even though human behavior driven by cultural factors is one of the underlying drivers of the IWT including in vultures, this aspect has been understudied by the conservation research community, and research efforts on behavior will need to be intensified to save vultures. Awoyemi (2014) investigated the scale and socioeconomic drivers of the trade in vulture parts for belief-based use. However, there was no aim to understand human behavior driving the practice of illegal trade in vultures in this study. This is the research gap which this study seeks to address. The study of sociocultural factors shaping behavioral patterns driving the illegal trade in vultures and other wildlife will provide important data to inform behavioral change interventions towards pro-conservation behavior among traders and buyers of vulture parts. This would lead to demand reduction and reduced pressure on threatened vulture species.

# Chapter III. Methodology

## III.1. Introduction

In this chapter, a description of the research approach, methods, justification, and ethical considerations taken during the study are presented. Further, the area where the study was carried out and how data was collected and analyzed are described. Finally, limitations of the data collected are explained.

## III.2. Ethnographic approach to answer RQ1 and justification

The ethnographic approach was chosen because the research involves studying sociocultural dimensions of the vulture trade for belief-based use which has strong cultural roots passed down through generations (Cocker 2000). Further, the approach was selected to study traders and buyers of vulture parts in their cultural setting, their language, symbols, rituals, and shared meanings with the purpose of generating a narrative of the concerned culture (Yoruba in this case) against a theoretical framework (Emerald Publishing Limited 2019). Ethnography entails the collection of data from observations, interviews, and documentary to make comprehensive reports of a variety of social phenomena (Reeves *et al*. 2013). Participant observation has been described as the core methodology for ethnography (Reeves *et al*. 2013). Sometimes, a difference is drawn between participant and non-participant observation, the former urges the researcher to be immersed in the study by learning through participating in the activities of the respondent (Atkinson and Hammersley 1998). Overall, the observer forms a spectrum from completely removed to completely engaged with the respondents (Sauro 2015). The systematic observation used for this study was the non-participant observation. Non-participant observation is a type of qualitative research that does not relatively attract attention and is for collecting key data about parts of the social environment without interacting directly with its participants (Williams 2008). This

methodological aspect of ethnography was chosen rather than participant observation to reduce risk of participating in an illegal activity such as trade in vulture parts for belief-based use and to avoid the ethical conundrum that this participation would bring. Advantages of non-participant observation include permitting the researcher to observe the situation with their own senses and therefore make judgements and see body language utilized; there is a greater possibility for the researcher to be open-minded because they are an outsider looking in – there is a lesser likelihood to sympathize and thereby produce biased data (Get Revising 2016). Disadvantages are non-participant observation can lead to Hawthorne effect which means people differ in the way they behave because they are aware they are being observed (this was reduced because the longer I was with the traders, the more they got used to me) (Get Revising 2016).

Interviews, another technique of ethnography, was an added benefit to this research because more focused questions related to the theoretical framework could be asked from both the seller and buyer of vulture parts using semi-structured interviews (see Appendix 1). Interviews are a relatively inexpensive way to acquire both basic factual and rich data even if this is not as accurate as direct observation might be (Lamont and Swidler 2014). For situations where observation might not be possible or difficult, interviewing may still be the best option available even though results must be treated with great care (Lamont and Swidler 2014). Another advantage of interviewing is that it accommodates attention to research design and comparison across backgrounds, circumstances, and types of people (Lamont and Swidler 2014). One disadvantage of interviews is that they are time intensive. This was addressed by granting myself longer stays in the field as part of the research design, which also enabled collection of more 'rich' data.

Other ancillary research techniques used were archival analysis to validate and explore further findings arising in the field and an analysis of policy documents which helped to develop a context

for the research in terms of understanding possible solutions to the problem and ongoing conservation efforts.

### III.3. Approach to answering RQ2 based on the findings of RQ1 and an extensive literature review

RQ1 of this study is to determine the sociocultural factors that shape the behavioral patterns of traders and buyers of vulture parts for belief-based use, and how. The answers to this question informed the approach to answering RQ2 which is how to minimize the vulture trade. RQ1 elucidated the behavioral formation pathways to trade and buy vultures, giving the basis to understand avenues to change these behaviors towards pro-conservation to minimize the vulture trade, within the theoretical expectations of the cultural transmission theory. These proposals to change behavior were supported by an extensive literature review on behavioral change, what has worked in conservation and other disciplines, and how my research's sociocultural context could shape these proposals. I therefore acknowledge that my response to RQ2 is 'speculative', but an 'informed speculation' based on the foregoing elements.

### III.4. Ethical considerations

Due to the engagement between researchers and participants, it can be ethically challenging for the former in ethnographic studies as they are personally participating in different levels of the study (Sanjari *et al*. 2014). Therefore, establishing research ethical guidelines is crucial in such situations and ethical issues need to be identified by researchers at all levels of the study from designing to reporting including "anonymity, confidentiality, informed consent, researchers' potential impact on the participants and vice versa" (Sanjari *et al*. 2014: 1). Considering the foregoing, my ethnographic hosts were allowed the opportunity for verbal informed consent in the local language Yoruba and the integrity of their confidentiality was not tampered with. There was

no fraudulent manipulation of data as all data were analyzed with sincerity and honesty. To protect the identity of the ethnographic hosts, their photographs were not taken, although photographs of wildlife parts were taken where the hosts gave consent. There was no taking of names of ethnographic hosts to keep them anonymous, and this was made known to them before any data collection. Ethnographic hosts were respected, and it was ensured that their dignity remained intact when leaving for another host. Care was taken so as not to implicate anyone in any manner. Other ethical considerations not mentioned here but mentioned in the CEU Ethical Research Policy (CEU 2018) were taken as top priority and implemented.

## III.5. Study area

This study took place in four cities (Ibadan, Ilorin, Ijebu-Ode and Abeokuta) in southwestern Nigeria (Figure 5). These cities were selected as study sites because they have been previously identified as important for IWT with open markets (Nikolaus 2001; Nikolaus 2011; Awoyemi 2014).

### III.5.1. Ibadan

Ibadan, a major trading center, serves as the capital of Oyo State in southwestern Nigeria at 7° 22' 39.22" N and 3° 54' 21.28" E (Filani 1994; Latitude 2021a), situated in the forest zone near the border between the forest and savanna (Oyebamiji *et al*. 2018). Based on land mass, Ibadan is the largest city in Nigeria (Oyekale and Ige 2012), with a human population of approximately 3,649,000 and growth rate of 2.73% (Macrotrends LLC 2021a). The rate of unemployment is 17.99% for Oyo State (NBS 2021).

### III.5.2. Ilorin

Ilorin is the capital of Kwara State, Nigeria at 8°30'N and 4°35'E, with a land area of about 100km$^2$ (Kwara State of Nigeria 1997), and a population of 974,000 with a growth rate 2.53% (Macrotrends

LLC 2021b). Kwara State like the other study sites is a Yoruba speaking state and is located in western Nigeria but within the north-central geopolitical zone of the country. The vegetation here is the Guinea savanna zone which has mostly tall grass (Olayemi and Ande 2008), although baobab, locust beans, shear butter, and acacia can also be found (Ajadi and Tunde 2010). The main occupation is trading, civil service, and informal services (Ajadi and Tunde 2010). The rate of unemployment is 16.55% for Kwara State (NBS 2021).

### III.5.3. Abeokuta

Abeokuta is the largest city and state capital of Ogun State at 7° 09' 20.56" N and 3° 20' 42.32" E (Latitude 2021b). The city is found on the east bank of the Ogun River and consists of large rocks in a wooded savanna (Latitude 2021b) and a population of 544,000 with a growth rate of 2.06% (Macrotrends LLC 2021c). The main occupation here is farming, textile production, trading, pottery, and fishing (Olabisi *et al*. 2008). The rate of unemployment is 16.36% for Ogun State (NBS 2021).

### III.5.4. Ijebu-Ode

Ijebu-Ode is also situated in southwestern Nigeria at 6° 49' 9.98" N and 3° 55' 2.32" E (Latitude 2021c) and is second largest next to Abeokuta in Ogun State (Oyeneye and Kawonise 1993). The population is 356,000 with a growth rate of 3.19% (Macrotrends LLC 2021d). The major occupations here are agriculture and trading (Coster and Otufale 2010).

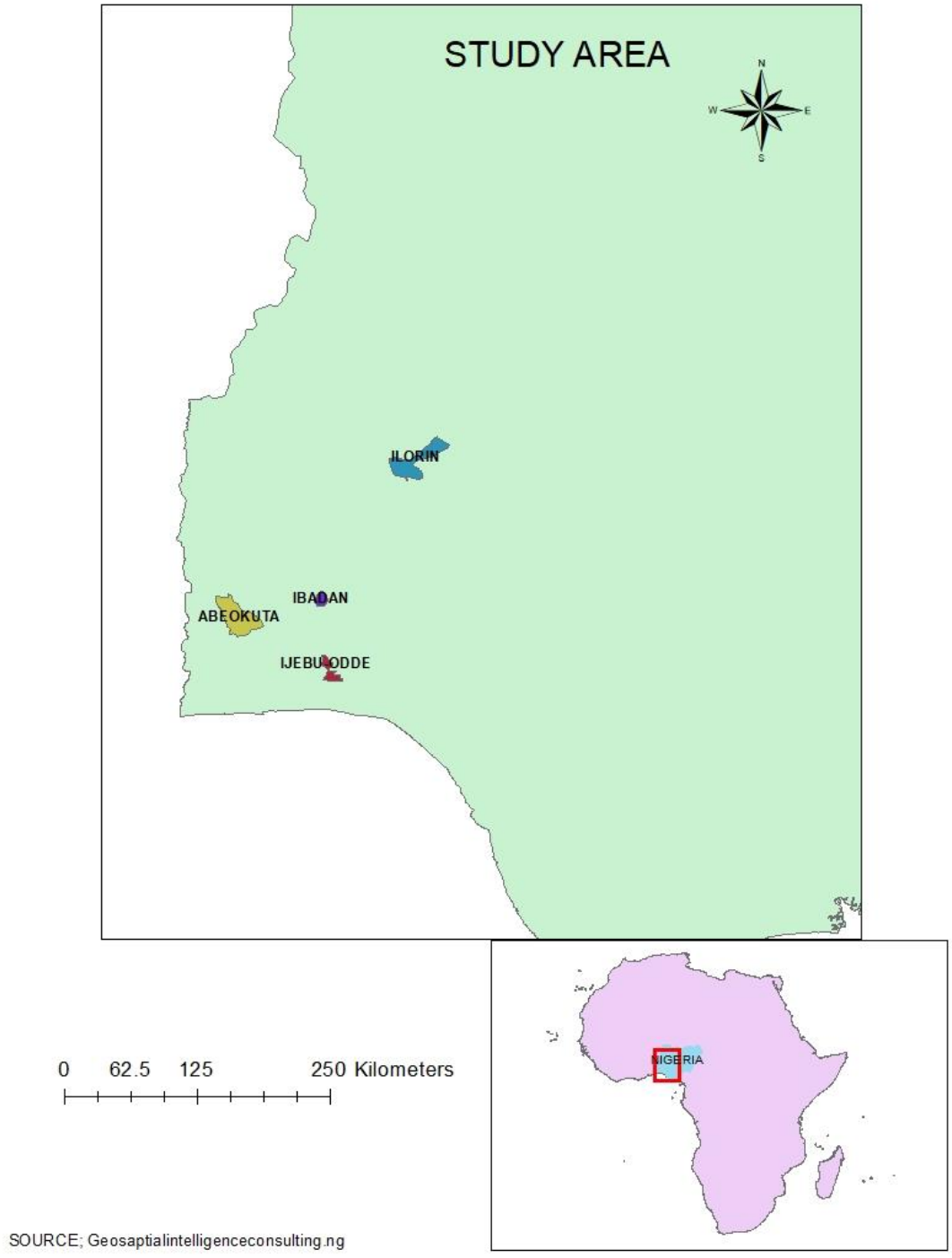



**Figure 5. Map showing study area in south-western Nigeria**

### III.5.5. The Yoruba ethnic group and their cosmology

The Yoruba ethnic group from southwest Nigeria has been reported as responsible for handling most of the trade for belief-based use in Nigeria (Nikolaus 2001; Nikolaus 2011). The Yoruba people group are one of the three largest ethnic groups in the country ranking second after the Hausa (Jegede 2002; Campbell 2021). Their population size is estimated to be 40 million (Campbell 2021). Yoruba are primarily resident in states of southwest Nigeria: Oyo, Ogun, Ondo, Osun, Ekiti and Lagos, with subgroups found in other regions of Nigeria (Sanu 2020). Outside Nigeria, Yoruba are found in Benin, Togo, and Sierra Leone with cultural influences spread as far as Cuba, UK, Brazil, and the US (Sanu 2020). Their language is Yoruba, and the main occupation used to be farming, although a majority now have white-collar jobs and engage in trading activities (Jegede 2002). Yoruba possess a strong identity and culture (Campbell 2021). Similar to other African cultures, Yoruba were once largely traditional worshippers, worshipping diverse gods and deities (Jegede 2002). Their worldview comprises worship of a supreme being called *Olodumare* (God), and they believe every plant, animal and natural phenomenon possess the divine (Jegede 2002). According to their cosmology, a few special humans possess the knowledge and ability to utilize the vital forces from God such as medicine men, witches, priests, and rainmakers (Jegede 2002). Moreover, Yoruba believe nature is not an impersonal object or phenomenon: it has religious importance (Jegede 2002). Even though foreign religions such as Christianity and Islam have taken over traditional religions, the people's present paradigm is still shaped by the old worldview (Jegede 2002).



## III.6. Data collection

Ethnographic data was collected from February to November 2020, in open public markets in the four cities named above. To answer RQ1, non-participant observation and semi-structured

interviews were conducted to understand socio-cultural influences on behavior of traders and buyers of vulture parts for belief-based use. Approximately one week was spent in each market shop (arriving to the shop at around 11.00am when business is just beginning to gain momentum and then leaving at 3.00pm when the peak of business usually begins to fall). I visited 10 traders in Ibadan, 9 in Abeokuta, 4 in Ijebu-Ode and 7 in Ilorin. Overall, across all four cities, I visited a total of 30 traders' shops, each for ~24 hours over the course of one week (total=720 hours). At each encounter of a trader or buyer, before the start of the data collection, I read a consent note to them in Yoruba, the local language, and with their approval I proceeded with the study. All interviews were made in Yoruba as I am from the ethnic group and speak the language. Because some participants were uncomfortable with me recording their voice with a digital voice recorder (OLYMPUS WS-853), I decided to take notes of interview responses. A total of 10 buyers were encountered by chance when they came to buy vultures or their body parts: 3 in Ibadan, 4 in Abeokuta, and 3 in Ilorin, respectively. Added to these buyers' interviews, were the interviews of an herbalist and an *alfa*, to give further context to the study. The herbalist provides healthcare services that are founded upon culture, indigenous traditional religion, knowledge, attributes, and beliefs common in the community (Ezekwesili-Ofili and Okaka 2019). On the other hand, *alfas* are Islamic scholars or Muslim clerics that serve as advisers and spiritual consultants to the Yoruba community (Sanni 2002). Socio-demographic data of all traders were also collected, namely, age, religion, gender, place of origin, and level of education. In some cases, a snowball technique was used, where traders introduced me to other traders, while at other instances, I found traders myself who were willing to host me. During the non-participant observation, although I did not participate in the activities of the traders, I interacted with them when the occasion called for it (e.g., questions and discussions about their work), sometimes getting meaningful information in the process. This

is in line with Sauro (2015)'s observation that there is a spectrum from completely removed to completely engaged with participants. RQ2 was partly addressed by obtaining data through purposive interviews of key staff of the FMenv in Abuja the Federal Capital Territory, Nigeria. An initial interview of a member of staff was made at the start of the field research and this was administered face-to-face and recorded on the digital voice recorder. A follow-up interview was conducted at the end of the field study with a different participant in the same Ministry, and through a phone meeting which was on speakers and recorded with the digital voice recorder. In both interviews, I read a consent note to the participants and gained their approval to proceed with the interview. Interviews were made in English, the lingua franca in Nigeria.

Where participants responses were not recorded with the digital recorder, notes were taken directly into a small field book and later transferred to Word document in a computer. In cases where the responses were recorded with the digital recorder, responses were transcribed onto a notebook and then later transferred to Word document in a computer.

### III.6.1. Description of public markets

In Ibadan, I visited two wildlife markets which are walking distance from one another and situated in a busy part of the city, close to a vehicular bridge. Most markets in southwestern Nigerian and elsewhere in the country are similarly situated in busy areas like this. These two markets are in a central area with easy access by communities living far and near through public and private motor transport and Okada (use of motorcycles as commercial transport). The markets have an irregular layout with concrete shop buildings and a combination of wooden stalls (Figure 6). This is typical of the cultural architecture of the markets in this part of Nigeria. In Nigeria, the urban market space permits rich and poor to make their income, support welfare and contribute to societal activities (Yunusa 2008). These markets are usually a hive of activity with high levels of noise at peak sale

periods. Vendors and hawkers utilize the advantage of the populated markets (Yunusa 2008). There are also people begging for alms from shop to shop. Overall, the market space gives access to income which serves to empower people inhabiting the urban area (Yunusa 2008).

**Figure 6. Section of an open wildlife market in Ibadan, Nigeria.**

The first wildlife market was quite crowded compared to the second. It comprises a combination of sale of wildlife, domestic animals, local herbs, and foodstuffs. The market adjoins a major tarred

road leading to the vehicular bridge. The main market is made up of mostly concrete shop buildings to the right and wooden stalls to the left, both facing the road and separated by a narrow path. The second wildlife market is situated just after the vehicular bridge coming from the first market and is inside a large, enclosed area. Wildlife and herbs are sold here as well.

The wildlife market in Abeokuta is adjoined to a major road with an overhead vehicular bridge running across the road (Figure 7). It is a very busy area of town with taxis, Okada and private vehicles hurriedly picking and dropping off passengers along the road. Wildlife parts are sold on

**Figure 7. Section of market in Abeokuta showing vehicular bridge (Source: Abolade 2020).**

both sides of the road. On one side of the road, sections beneath the bridge are used as market space by a variety of traders including wildlife traders. Food vendors, traders of traditional attire, phone SIM cards, fresh vegetables, fish etc., are found under the bridge. The opposite side of the road is where the main market is located and comprises a combination of open and sheltered market spaces. Along the stretch of the front of the market facing the road are lined up traders of wildlife parts, foodstuffs, and other products. The interior of the market is irregularly arranged with shops housing traders of all sorts meshed with wildlife traders.

Ijebu-Ode is the smallest town relative to the four study sites and the wildlife trade here is relatively little compared to other sites. The main wildlife market is found not as an open market, but shops are in a very long stretch of a large building similar to a warehouse, having an organized interior with individual shops (Figure 8). There are many kinds of traders (traders of foodstuffs, plastics, clothes, detergent, household utensils etc.) including wildlife traders within and outside the building. Apart from this market, there are also pockets of wildlife shops in other markets and one major individual shop located in town.


**Figure 8. Section of market in Ijebu-Ode (Source: Wikimedia Commons 2019)**

In Ilorin, the wildlife market is also extensive like that in Ibadan and Abeokuta. It is in the interior of a very busy general market. In the wildlife market section, a street runs through the market with stalls of wildlife traders on both sides. Before the end of the street, a passageway leading further into the market opens up to a more extensive wildlife market space. There are about three pairs of successive blocks of wildlife shops on the left side of this space coming from the junction. Between each pair of blocks of wildlife shops is a narrow path. There are other mini-sections of wildlife shops in the vicinity of and beyond these pairs of buildings.

### III.6.2. Account of experience with traders and buyers of vultures during data collection

In almost all the instances of meeting my ethnographic hosts (traders), I was introduced by a third party. It was only in a few exceptions that I walked up to a trader as a complete stranger. In all cases, I was treated with respect and provided a temporary space within the shop. Some traders went as far as showing hospitality by offering food and drinks. They wanted to make sure I was comfortable while in their shops. Showing respect to the traders and being genuinely interested in their work was appreciated by these traders as well. Some told me they had children like me and being good to me was a way of doing what they expect to be done to their own children in their respective journeys in life.

Every day the routine for traders is basically the same. After cleaning the shop, they display wildlife parts on tables waiting for buyers to patronize them. I observed that the frequency of buyers was not the same for all traders. In some shops, I sat for long periods, sometimes 3-4 hours and nobody came to buy anything, while in other shops customers were regular and several. In other circumstances, it depends on the particular day. If it is a market day[3], an influx of customers is expected, so wildlife traders are prepared, bringing out all their wildlife parts from the store in large quantities and displaying them for sale. Throughout my stay in some traders' shops, I noticed regular customers came almost every day bringing lists of items with them. The items on each list are written in Yoruba and are names of different kinds of wildlife and herbs. If a trader does not have a vulture in stock for instance, for their customer, they will go and look from other traders and bring to the customer who will pay for it. The trader will then settle the other trader who provided the vulture. The same goes for any wildlife product or herb traders do not have in stock.

[3] A market day is a set aside day every 3-5 days, where market activities are intensified with traders coming from far and near to trade in the marketplace.

Transactions with customers in another town are sometimes made through WhatsApp. For instance, one trader narrated how he sold a lion hide to a traditional ruler in another city by first sending pictures of the hide to the ruler's assistant through WhatsApp. Traders possess a vast variety of wildlife parts and herbs in their stores, sometimes sealed in cylindrical metal containers or kept in shelves, boxes or sacks. They know all the local names of these wildlife and medicinal plants showing rich traditional knowledge. For example, from chameleons, frogs, tortoises, lizards, hedgehogs to all kinds of birds, rats, apes, antelopes, lions, and leopards, these animals and their local names are all known to these traders. Other products are shea butter, honey, tobacco leaf, earthen pots, and gourds. Once a customer comes with any name on their list, they are able to identify and locate the product and bring it out from where they kept it. They also help customers to identify any samples of wildlife products or herbs that they bring along. Aside from attending to customers, traders also observe their daily routine of going to the mosque for prayers at prayer times during the day. On Wednesdays, all traders throughout the markets in all study sites do not sell until after 1pm. They cover all their wares with a tarpaulin. During this period of no sales, head traders attend the Elewe-Omo Association weekly meeting where deliberations about commodity prices, loan issues, settling of disputes, government provisions or injunctions and other pertinent issues are made.

It is important to note that the vulture trade is just a sub-set of the larger wildlife trade that these traders involve in. Vultures are one of the many animals and plants that they sell and there were several wildlife traders I saw who were not into selling of vultures. In essence, traders inherit the wildlife trade profession which includes selling of vultures, per se.

## III.7. Data analysis

Data analysis is the main stage in qualitative research and is defined as the organization and interpretation of a material - lingual or visual - in order to make statements of meaning-making in the material and what is represented in it (Flick 2014). It follows gaining access to the field site, when decisions on sampling design have been made, and data have been taken, recorded and transcribed (Flick 2014). The essence of data analysis is to look for important meanings, patterns, and themes in the outcome of both auditory and visual observations by the researcher (Ruona 2005). Meaning in qualitative data, analysis is made through the researcher's interpretative lens (Ruona 2005). However, the kind of meaning differs in connection to the theoretical perspective taken for the design of the study (Froggatt 2001). The position of theory may not be predictable or clear at all times in qualitative research (Leeming 2018). Sometimes, the goal is to develop new theory from the data, rather than the researcher's own ideas brought to the study (Leeming 2018). In other instances, prior theory has an important role in designing qualitative research in terms of guiding data collection and analysis (Leeming 2018). This dissertation research used this approach in its qualitative research where Cultural Transmission Theory shaped the research design including research questions, data collection, analysis, and interpretation. The theoretical application in this study is the basis for proposing policy solutions to the illegal trade in vultures in southwestern Nigeria as long as it has been confirmed that it applies to the cultural setting, language, symbols, rituals and shared meanings of the target population (Emerald Publishing Limited 2019). For example, Leeming (2018) has posited that depending on theory during analysis of qualitative data and reflecting on philosophical assumptions can give opportunities for a novel and clearer point of view on the data and increase the transferability of discoveries and the study's contribution to wider research and to practice.

In conducting qualitative data analysis, the following stages are outlined and explained (Ruona 2005):

**i. Data preparation**

Before data analysis, data collected must be transcribed and 'cleaned up' (minor editing, tidying, and formatting). Further, this involves organization of data and a time to take precautions in protecting the identity of participants. Lastly, the researcher should back up their transcripts at various stages in the process.

**ii. Familiarization**

This is the stage in which the researcher immerses themselves in the data more profoundly. It involves listening to recordings, reading the data repeatedly, taking notes and memos about observations and what is thought to be happening in the data. This stage is an opportunity to identify potentially important data that will be employed as one progresses with analysis.

**iii. Coding**

This is the initial step in organizing data into categories with invariant meaning. It is a term that covers giving labels to segments of data, so that all text under each label can be brought together. Coding can be thought of in two ways: *data simplification* which entails breaking data into simpler and more general categories, and *data complication* where codes are opened up to other analytic possibilities, through interrogating the codes that have been identified (Froggatt 2001). Codes are labels that range from letters, numbers, and words to phrases, and they represent patterns observed in the data. They are the primary units of analysis that pick up important aspects of the data that are applicable to the research question (Clarke and Braun 2017). They generate themes, broader patterns of meaning supported by a shared central idea (Clarke and Braun 2017). Themes give a

framework for organizing and reporting the outcome of the data analysis (Clarke and Braun 2017). Thematic analysis is therefore a process of identifying, analyzing, and interpreting themes within and across a data set (Braun and Clarke 2012; Clarke and Braun 2017). It can be used to point out patterns within qualitative data (e.g., interview transcripts) that are pertinent to participants' lived experiences, perspectives, behavior, and practices (Clarke and Braun 2017). Many patterns could be pointed out across any data set – the essence of analysis is to spot those pertinent to answering a specific research question (Braun and Clarke 2012). Thematic analysis covers three main aspects of qualitative research approaches: inductive (data-driven) against deductive (theory-driven) data analysis, an experiential against critical orientation to data and an essentialist against constructionist theoretical perspective (Braun and Clarke 2012). The qualitative data analysis of this study was done using the thematic analysis technique because it is a typical method for analyzing data from interview transcripts (Mooney-Somers *et al*. 2008). It is an especially useful and straightforward method, providing an avenue for those new to qualitative research that otherwise can seem unclear, conceptually challenging, and complicated (Braun and Clarke 2012). Another advantage of thematic analysis is that it is accessible to a wider audience, for example, by research teams in which not all members are qualitative data experts (Braun and Clarke 2012).

**iv. Generating meaning**

The interpretation of data is a core aspect of data analysis and even though this process is ongoing throughout the analysis, it starts proper when the coding and categorization of the data have been completed. It is the stage in which meaning is generated from what has been observed and learned, and themes generated during the analysis are used to develop thought. The goal is to creatively determine how ensuing themes connect to each other and ideas from the researcher, the literature, prior research, etc. However, a few risks are identified in the sense that the researcher may

speculate far beyond the case, miss the point of the data's meaning, and formulate theories to forward one's arguments without support from the data. The process of data analysis used in this study now follows.

### III.8. Process of data analysis

Data analysis is ongoing throughout the life of a research and does not necessarily start after data has been collected (O'Dwyer 2004). In this dissertation research, since my first interview of traders of vultures and throughout the field work, I questioned various people outside the project to have a more robust understanding of my findings and validate my musings, discussed emerging thoughts with my supervisor, consulted the literature and took down notes as I tried to make sense of the data. The following steps were taken in the qualitative data analysis:

- **Data recording**: Because some participants among traders and buyers of vultures were uncomfortable with me recording their voice with a digital voice recorder (OLYMPUS WS-853), I decided to take notes of interview responses. However, staff of the FMenv in Abuja the Federal Capital Territory, Nigeria, consented to having their voice recorded with the digital voice recorder.
- **Transcription and cleaning up data**: The recorded interview responses were transcribed in Microsoft Word and slightly edited (removing filler words and correcting mistakes) for clarity. Field notes taken were also typed in Microsoft Word. All documents were digitally archived.
- **Familiarization**: All interview transcripts were read repeatedly in order to be familiar with and understand the overall data. Notes taken down during reflections and consultations at the time of the fieldwork were also read.

- **Coding**: There are two kinds of codes, namely, descriptive (description of the data content) and interpretative (interpretation of the data content) (Braun and Clarke 2012). The kind of codes used in this study are interpretative codes. Open, axial, and selective coding were used in assembling, categorizing, and thematically sorting the collected data with QDA Miner Lite software (Williams and Moser 2019; Figure 9). Open coding involves scanning through the pages of text (imported into the QDA Miner Lite software) and highlighting segments of the text of invariant meaning related to the research aim and theoretical framework. The next stage, axial coding involves the categorization of emergent relationships between open codes to form core codes (Strauss and Corbin 1998). Selective coding, which is the final stage, is the integration of categories from axial coding into themes (Williams and Moser 2019). The identified themes informed a thoughtful evidence-based interpretation of the data with support from the theoretical framework of the dissertation research.

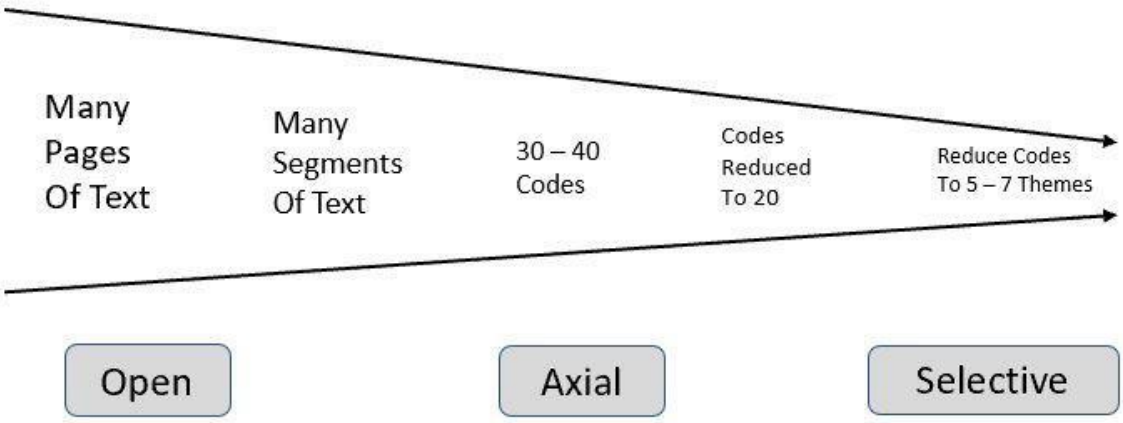



**Figure 9. Overview of coding process: Open, axial, and selective coding. (Source: Williams and Moser 2019)**

## III.9. QDA Miner Lite for Computer-Assisted Qualitative Data Analysis (CAQDAS) and SPSS for descriptive statistics

I used QDA Miner Lite to inform the thematic analysis of the qualitative data for this study. There is increasing use of professional software for qualitative data analysis (Chomczynski 2008). Software makes conceptual work easier, facilitating work with large data that would take more time with conventional methods (Chomczynski 2008). QDA Miner Lite is the free version of QDA Miner and is a qualitative data analysis software package made for coding textual and photographic data (LaPan 2013; Provalis Research 2020). I used the software to organize my data for coding, text retrieval and storage. The software also enabled me to identify patterns and themes in my data.

Descriptive statistics of the socio-demographic of traders is one method of analysis I used to understand measures of central tendency and dispersion, and this was calculated using SPSS (IBM SPSS Statistics 23).

## III.10. Limitations of the data

One limitation of the data collected in this study is the low number of buyers interviewed. The number of interviewed buyers were few because (i) vulture parts are expensive and not frequently purchased so the market is very slow for vultures, for example, according to Awoyemi (2014), the price of a hooded vulture head and whole carcass in 2014 was about 2,000 Naira (~5 USD) and 9,000 Naira (~23 USD) respectively, but in this study, a hooded vulture head and whole carcass was 9,500 Naira (~24 USD) and 16,000 Naira (~43 USD) respectively before the Covid-19 pandemic and as of November 2020 was 15,000 Naira (~39 USD) and 35,000 Naira (~93 USD) respectively; (ii) some buyers are actually traders that buy to sell again elsewhere; and (iii) buyers may arrive after I left or before I arrived, given, I had a window of time to be in the market. This

window of time was based on my discovery that peak sales in the wildlife market were between 11am and 3pm. Following on this, if there are not that many buyers before 11am and after 3pm, then it is expected that only very few buyers could have been added to the sample. Thus, it is reasonable to suggest that the greatest obstacle in finding more buyers is the cost factor. Another limitation of the data is that the results cannot be generalized to other regions of Nigeria but apply only to the public markets in the study area, as this was a qualitative study where richness of data is the emphasis not generalizability.

## III.11. Conclusion

The foregoing methodology that I utilized in this study was well suited to addressing my research questions by giving me an opportunity to be immersed in the study and giving me room for flexibility in adjusting my interviews considering new information. Ethnography as a research method provides avenues to thoroughly understand cultural systems through sufficient time and engagement opportunities that reveal information and depth that would otherwise be missing in a one-off data collection approach as is characterized by other methods. Given belief-based use of vultures and their trade are culturally embedded practices, ethnography is the most practicable method where rich data of these historical and cultural practices can be elicited from respondents.

# Chapter IV: Socio-cultural Factors that Shape the Behavioral Patterns of Traders and Buyers of Vultures for Belief-Based Use

## IV.1. Introduction

In this chapter I describe the results and analysis of ethnographic data collected through semi-structured interviews and non-participant observation of traders and buyers of vultures and their body parts in wildlife markets in southwestern Nigeria. The purpose of the analysis was to address RQ1 to identify which socio-cultural factors shape the behavioral patterns of buyers and traders of vulture parts for belief-based use, and how. These findings have implications for conservation policy by helping to develop possible solutions to the illegal trade in vultures in the study area.

## IV.2. Traders: Socio-demographic attributes

This section presents the socio-demographic data collected from traders of vultures in the study area. These data help to understand ancillary factors that may be contributing to influencing behavioral patterns of traders to sell vultures.

### IV.2.1. Age

The ages among interviewed vulture traders range from 22 to 86 years (mean=47, sd=14.83; n=29 as one trader did not provide their age). This mean age suggests that in general, there are less youth involved in vulture trade in the wildlife markets in the study area. This might be because most youth are involved in educational pursuits or employed in more prestigious job opportunities and/or as a result of cultural erosion due to globalization (Yankuzo 2014). Although, where youth are involved in the vulture trade, it may be because of lack of employment and economic hardship as observed in this study (see section IV.2.5).

In Nepal, age is considered a contributory factor to the illegal trade, as traders between 20 and 30 years were considered the most vulnerable in committing wildlife crime because this age group sought for opportunities the most (Dangol 2015). However, the situation with vulture traders in this study area is more complicated, because 90% of respondents said they were born into the profession or started from childhood and the average age for traders as determined is ~47 years. But within the mix of traders, relatively, a low number of traders aged between 20-30 years was recorded. In contrast to my study, Sharma *et al*. (2020) discovered pangolin traders in Nepal were 17-40 years old and were typically poor, uneducated, unemployed, male and of working age.

Age is considered a contributory factor in Sharma and colleagues' study because people of working age were involved in the pangolin trade to meet family economic needs (Sharma *et al*. 2020). But in my study, some traders were past working age with the oldest trader aged 86 years and even though a majority had a low level of education, some were quite wealthy. Working age is therefore not likely a contributory factor to involvement in the illegal trade in vultures in the study area. However, the identified age range is important to inform policy and management strategy in identifying the target audience among traders of vultures that need behavioral interventions in the study area (section V.3.).

### IV.2.2. Religion

Similar to findings of Soewu *et al.* (2012) and Awoyemi (2014), Muslims had the highest frequency among interviewed traders of vulture parts in the sampled markets, constituting 93.3% (n=30), with only one Christian and one Traditional Religionist[4]. This high level of Muslim adherents among traders of vultures and other wildlife points to the occurrence of syncretism

[4] These are persons with indigenous beliefs and practices (Awolalu 1976)

among Yoruba Muslims as discussed later in section IV.4.4. (Balogun 2011). This is because fetish practices such as sale of wildlife for belief-based use is not originally Islamic but has roots in Traditional Religion. Christianity, the other main religion in Nigeria frowns at traditional religious practices, with a long history of conflict with Traditional Religion in the country (Okeke *et al*. 2017). The estimated proportion of religions in Nigeria in 2018 is as follows: Muslim 53.5%, Roman Catholic 10.6%, other Christian 35.3%, other 0.6% (The World Factbook 2021). This suggests why Muslim traders are more in number than Traditional Religionist traders who are the original custodians of these cultural beliefs (Balogun 2011). The occurrence of majority Muslims among illegal wildlife traders, due to the practice of syncretism among Yoruba Muslims, gives religious support to the trade profession and sustains its continuity.

### IV.2.3. Gender

There were significantly more women traders (90%; n=30) of vultures than men interviewed in this study. Similarly, Nikolaus (2001) reports bird shops in Nigerian fetish markets are run mostly by women and Soewu *et al.* (2012) report women comprising over 90% of traditional medicine traders in all the zones of Ogun State in southwest Nigeria. The role of women traders of vultures can be examined in two ways. First, as custodians of and transmitters of traditional knowledge, and second, their role in IWT.

This ethnographic study revealed women traders to be in possession of rich traditional knowledge, able to identify and name a large variety of wildlife and plants. However, these women are not necessarily experts in the uses of these products (the traditional healers deal with the uses of the wildlife and herbal products) (Nikolaus 2001). This gendered role of being custodians of traditional knowledge as relates to the wildlife trade is also connected to their ability to be able to transmit these cultural traits to their children. From observations during ethnography, even though

women usually pass on this traditional knowledge to their children, the recipients are mostly female. In fact, most men found in the wildlife trade in this study were taught by their mothers or grandmothers. Voeks (2007) similarly reports gendered roles of plant knowledge among women with middle to elderly age acting as reservoirs of traditional ethnomedical knowledge in Lençóis town, northeast Brazil. Communities settled in this region are dominated by people of African descent (Voeks 2007).

Women traders reported traveling far and wide to get wildlife products to sell in their own towns. For instance, one respondent, stated: "*I trained for this work under my mother. After learning the trade, she sent us to travel to any city like Kano, Ilorin, Onitsha, and Aba. We go and buy wildlife parts in these markets. When we have bought from these markets, we sell here in our markets singly and in dozens. Then we can start our own businesses. Some people learn from childhood, some from adulthood. Adults spend six to seven years learning the trade depending on how fast they grasp the business*" (Trader 8, Ibadan, Female, 45 years old). However, there is a paucity of data on the roles of women in wildlife trafficking in Africa with implications for conservation science and policy (Agu and Gore 2020). Spotlighting the overwhelming role of women in the IWT to the recognition of conservation managers and policy makers should elicit more targeted conservation efforts rather than the generic interventions that lack recognition of the gendered nature of the wildlife trade (Alegba 2019).

It was observed in this study that all buyers interviewed were men (the buyers were not purposively selected but were interviewed as they came to buy vulture parts) and half of these men indicated vertical cultural transmission through men (meaning they knew how to use vulture parts through their fathers). On the other hand, traders were mostly women and vertical cultural transmission of the trade profession was primarily through women. Similarly, Borokini and Lawal (2014) observe

that in Nigeria, traditional medicine knowledge is transmitted in Yoruba culture from father to son and mother to daughter from one generation to the other. Agunbiade *et al*. (2012) suggest that the primary role of women in herb selling may be because of the cultural genesis of herb sellers as *Elewe-Omo. Omo,* means an infant and motherhood in Yoruba culture includes care and support of one's children which requires knowledge on traditional ways of making provision for the children's health (Agunbiade *et al*. 2012). This role of Yoruba mothers caring for the health of their children using herbs, in ancient times, may have evolved into them being dealers in herbal and wildlife products for traditional medicine. However, according to Agunbiade *et al*. (2012), historical, economical, psychological, and political dimensions may have more explanations for the feminization of herb selling among the Yoruba. For instance, in general and historically, Yoruba women have been known as marketers selling the farm goods that their male counterparts have cultivated (Sudarkasa 1973). It has been suggested that since most Yoruba women have few employment options because of lack of specialized skills, they must trade to make a living (Sudarkasa 1973).

### IV.2.4. Place of origin

Among all traders interviewed, the places of origin are from the same city in which they sell. In all 30 cases, no foreigner was found selling in the wildlife parts market. The finding is particularly noteworthy because foreigners are found in adjoining markets who sell plastics, beverages, fruits, and other perishable food items. This is understandable given the wildlife trade profession is passed vertically within families in the same cultural settings and it seems that horizontal transfer of cultural traits on the wildlife trade to unrelated persons is with those of the same culture and in the same cultural settings as well. Another reason might be that the wildlife trade among the Yoruba, being culture specific may discourage foreigners from interest in the trade.

### IV.2.5. Level of Education

The level of education of traders in this study varied widely, ranging from None (6.7%) to HND (Higher National Diploma) (6.7%), with SS3 (Senior Secondary 3) having the highest percentage (46.7%) followed by Primary 6 (26.7%) (Figure 10).

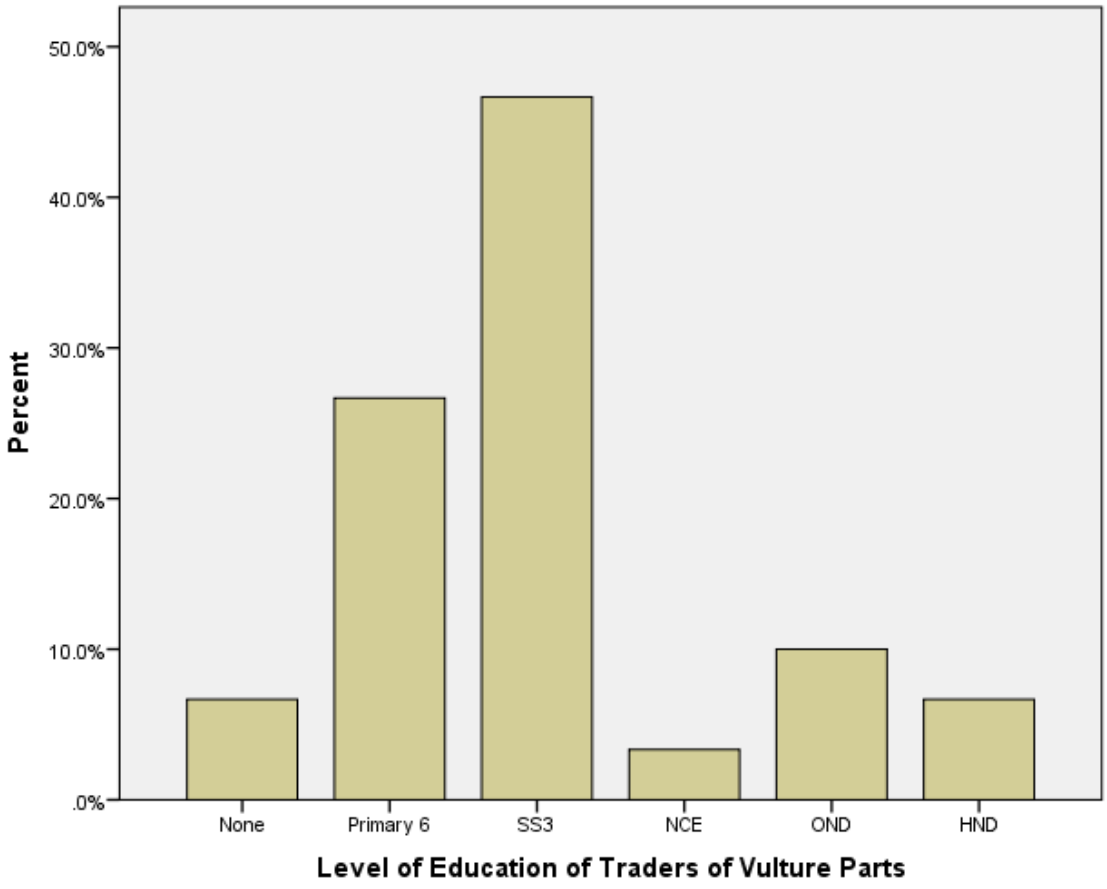



**Figure 10. Frequency of level of education of traders of vulture parts**

None; Primary 6; SS3 (Senior Secondary 3; the final level of senior secondary equivalent to 12$^{th}$ grade); NCE (Nigeria Certificate in Education; awarded to graduates of colleges of education); OND (Ordinary National Diploma awarded at a polytechnic, a two year course qualification that is sufficient for employment in some cases and to get admission for a HND or direct entry into 200 level in a university); HND (Higher National Diploma awarded at a polytechnic; sometimes referred to as equivalent of a first degree).

Across all 30 traders, the majority have a low level of education. In a larger context, it has been reported that literacy rates in southwest Nigeria as of 2018 are 89% of males and 80.6% of females (Varrella 2020). The National Population Commission (NPC) states that the southwest surpasses the national average regarding access, retention, and learning (NPC 2004). However, the mismatch of this statistic with the low level of education among traders is explained by their being in a profession that does not require much education. The few exceptions to this low level of education among traders were discovered when the researcher encountered wildlife traders (although not identified as vulture traders) who are BSc holders and one PhD holder. The economic hardship in the country might have encouraged these degree holders to continue in the family business. For example, an excerpt from the researcher's field notes states, *I am told that some university degree holders are here selling wildlife parts. One of them who I met said she studied Biochemistry. The head trader tells me that when some of these women graduate from the university and find no jobs, they join their mothers in the wildlife trade business.* Unemployment in Nigeria has a long history and in 2019 was reported to be as high as 25% coupled with 20% of 186 million people being underemployed (Sikich 2020). Further, unemployment levels for youth between ages 15 and 35 was at 55.4% in 2019 (Sikich 2020). The low level of education among traders of vultures might explain their limited options of livelihood opportunities and one reason they take up the family business.



### IV.3. Traders: Socio-cultural factors

To derive a thematic analysis of qualitative data from interview scripts of traders of vultures, codes were sorted based on relevance to RQ1 and on the theoretical framework. This followed the coding process described in section III.6. (iii). To move from codes to broader categories or themes, codes with their generality and frequency were initially identified (Adu 2017; Table 4). Dominant codes

(codes with high generality and frequency) from Table 4 were then sorted and placed under separate clusters and used to form categories and themes of related units of meaning (Adu 2017; Tables 5 & 6).

**Table 4. Traders: Codes, description, generality,[5] and frequencies[6]**

| Code | Description | Generality | Frequency |
|---|---|---|---|
| Born into the profession | Trader was born into the profession of wildlife trade | 16 | 17 |
| Taught apprentices | The trader taught other persons the trade | 14 | 14 |
| Render help | *Elewe-Omo* helps its members | 12 | 13 |
| Taught by mother | The trader's mother taught them the trade | 11 | 13 |
| Taught their children | The trader teaches their own children the trade | 11 | 12 |
| Inherited trade | The trader inherited the trade profession | 10 | 12 |
| Association's importance | Between the general trade union and *Elewe-Omo* Association in the market, Elewe-omo is more important in influencing the trader to selling wildlife parts. | 9 | 9 |
| Taught by grandmother | The trader's grandmother taught them the trade | 7 | 7 |
| Financial aid | Finanicial aid from *Elewe-Omo* in terms of loans, cash gifts etc. | 4 | 7 |
| Emotional support | Members of the *Elewe-Omo* receive emotional support | 5 | 5 |
| Taught many | Trader has taught many people the trade | 4 | 4 |
| Taught by parents | Parents taught the trader the wildlife trade | 3 | 3 |

[5] Number of respondents attributed a code

[6] Number of times a code was attributed across the interview scripts

| | | | |
|---|---|---|---|
| Settle disputes | *Elewe-Omo* settles disputes among traders and between traders and buyers | 2 | 2 |
| Learnt as an apprentice | Trader learnt the trade as an apprentice | 2 | 2 |
| Taught sister | Trader taught sister | 2 | 2 |
| Taught by mother's friend | Trader was taught by mother's friend | 1 | 1 |
| Taught friends | Trader taught friends | 1 | 1 |
| Taught family member | Trader taught family member the trade | 1 | 1 |

**Table 5. Traders: Categories**

| Cluster 1: *Vertical transmission (67)* | Cluster 2: *Horizontal transmission (22)* | Cluster 3: *Social support (36)* |
|---|---|---|
| Born into the profession *(17)* | Taught apprentices *(14)* | Render help *(13)* |
| Inherited trade *(12)* | Taught many *(4)* | Association's importance *(9)* |
| Taught by mother *(13)* | Learnt as an apprentice *(2)* | Financial aid *(7)* |
| Taught their children *(12)* | Taught friends *(1)* | Emotional support *(5)* |
| Taught by grandmother *(7)* | Taught by mother's friend *(1)* | Settle disputes *(2)* |
| Taught by parents *(3)* | | |
| Taught sister *(2)* | | |
| Taught family member *(1)* | | |

**Table 6. Traders: Themes**

| Cluster 1: *Cultural transmission (89)* | Cluster 2: *Social support (36)* |
|---|---|
| Vertical transmission *(67)* | Social support *(36)* |
| Horizontal transmission *(22)* | |

Thus, according to statements from **traders**, two sociocultural factors, namely, *cultural transmission* and *social support* are determinant in shaping behavioral patterns for trade of vulture parts for belief-based use.

The result of the thematic analysis, cultural transmission, is an outcome of the application of the Cultural Transmission Theory on the data collection and analysis. Social support on the other hand, is an emergent theme from the analysis. It comprises cultural traits (Table 5) that can be transmitted horizontally among members of the *Elewe-Omo* Association but not with utility for socialization to sell vultures which has already occurred before joining the trade association.

The *Elewe-Omo* Association is made up of wildlife and herbal traders among the Yoruba in southwestern Nigeria (Sofidiya *et al*. 2007). Respondents stated the trade association renders help to its members in terms of access to wildlife markets in other cities, financial aid such as loans and cash gifts, emotional support and settling of disputes. In the next sub-sections, I focus on vertical and horizontal transmissions (as these are the categories that make up cultural transmission) and then social support.

### IV.3.1. Vertical transmission

Trade in vultures and other wildlife in the study area is mainly a family trade practice and is vertically transmitted. This trade is a skilled domain involving mastery of traditional knowledge which is learned from childhood through propagation of cultural traits from parents (usually the mother or grandmother) to offspring. This is illustrated in the following exemplar quotes from respondents:

*I inherited it from my grandmother. It is the situation of the country that has led us into this kind of business. Since there is hardship, we had to take up our family business.* (Trader 4, Ilorin, Male, 36 years old)

*One of my children continues with the business since I did so from my own mother, they ought to do so.* (Trader 9, Abeokuta, Female, 45 years old)

*It is a family business. I learnt from my grandmother.* (Trader 6, Ilorin, Female, 63 years old)

*I have taught my three children. They will have their education and do this work.* (Trader 2, Ilorin, Female, 40 years old)

Cultural traits that involve trade in wildlife are transmitted through instruction (e.g., the identification of plants and wildlife), modeling (e.g., behavior in dealing with buyers), and demonstration (e.g., preparation and preservation of wildlife parts). This type of cultural transmission is described as socialization as explained in section II.3.3. which is when behavior is deliberately influenced by way of teaching the individual. However, it is important to note that the nuclear family of wildlife traders is not independent of society, but a highly differentiated subset of society (Parson and Bales 1955). As socializing agents, parents beyond their familial roles also have their roles interwoven with other societal structures which as a necessity are a condition for their functioning effectively as agents of socialization (Parson and Bales 1955). Children too, have their socialization extend beyond their family of orientation into structures which are outside the family though interwoven with it, such as the school and peer groups (Parson and Bales 1955). For example, wildlife traders are parents and are at the same time members of other social institutions such as the *Elewe-Omo* which sustains and reinforces the trade practice.

There is also a supporting belief in the perpetuity of the family and cultural heritage which is mandated by some parents as shown in the quotes above. Children of wildlife traders grow while with their mothers in the shops (when they return from school), going on errands and observing their parents until maturity. As one respondent remarked:

> *"I grew up with my mother doing the business and learnt from her. When we returned from school, we joined our mother in the market and continued to do this until we finished school. We then joined our mother in the business*" (Trader 10, Ibadan, Female, 45 years old).

When a mother dies, the mature child may take over the wildlife trade and continue in their mother's stead. A respondent's statement confirms this:

> *"From 8 years I was already helping to count money from business. I also made beads under my mother. When my mother returned to Ibadan from Lagos in 1970, I came under her and continued this work. When I was with my mum, I worked under her until I became ready for marriage and got married. When I started giving birth, I was still with my mother until 1995 when she died. When my mother died, I carried on with the business until now"* (Trader 5, Ibadan, Female, 50 years old).

Similarly, Eyssartier *et al*. (2008) report that traditional ecological knowledge of horticultural practices among rural populations of north-western Patagonia is mostly propagated through vertical transmission, starts in childhood, and mothers are the major transmitters. Other studies

have also reported this pivotal role of women in vertical transmission (Voeks 2007; Vazquez-Garcia 2008). Two of the codes[7] under vertical transmission will now be discussed (see Table 5).

#### IV.3.1.1. Born into the profession

Over half of the 30 respondents stated that they were born into the profession. This is typical of a family where the wildlife trade profession is familial, among the Yoruba. As has been expatiated in section IV.2.3, the wildlife trade profession in these families is matrilineal, meaning the profession is vertically transmitted through the mother's lineage. For example, one respondent stated: "*I was born into this work. I followed my mother to the market and back home*" (Trader 3, Ibadan, Female, 30 years old). Another stated: "*I was born into this work, there was no time I underwent special training per se*" (Trader 5, Ibadan, Female, 50 years old). Although, in a few cases according to this study, being born into the family of a wildlife trader does not make continuing in the profession mandatory. This is seen in the following statement, for example: "*It is not a must that all my children must do the business. Some continue in the trade; others go to school or learn another type of trade*" (Trader 10, Ibadan, Female, 45 years old). But some insist that their children must continue in the profession. For example, one respondent stated: *One of my children continues with the business, since I did so from my own mother, they ought to do so.* (Trader 9, Abeokuta, Female, 45 years old).

#### IV.3.1.2. Inherited trade

Some respondents used the words "inherited the trade profession" in explaining how they came about selling vulture parts. In this case, this is to mean succession i.e., taking over the mother or grandmother's trade when they die. For example, one respondent stated: "*I inherited the trade and*

[7] The remainder codes have explanations in other parts of the chapter or are deemed unimportant for elaboration or potentially repetitive. The same applies for the codes under horizontal transmission.

*my grandmother was the initial owner of the business*" (Trader 3, Ilorin, Female, 40 years old). In terms of succession, another respondent put it more clearly: *"…When I started giving birth, I was still with my mother until 1995 when she died. When my mother died, I carried on with the business until now"* (Trader 5, Ibadan, Female, 50 years old). Similarly, Nikolaus (2001) reports that the tradition of fetish selling among the Yoruba is passed down within a family. In northern Nigeria, where you have the Hausas, Saidu and Buij (2013) report that 90.3% of vulture traders surveyed inherited the trade from their parents. Succession of the illegal trade in wildlife among the Yoruba explains its continuity and sustenance over the years.

### IV.3.2. Horizontal transmission

Apart from receiving and transmitting cultural traits vertically through families, traders also receive and transmit cultural traits to unrelated persons. This is illustrated in the following statements of respondents:

*I learnt the trade as an apprentice for seven years* (Trader 9, Abeokuta, Female, 68 years old).

*I have trained up to seven persons to be on their own as wildlife traders* (Trader 5, Ibadan, Female, 50 years).

Because the illegal trade in wildlife is deemed to be very lucrative, it may attract others outside the family tradition to learn the trade as apprentices. For instance, a field note excerpt is as follows: *I ask her* [illegal wildlife trader] *who owns the Honda Jeep in front of her shop, and she says it is hers. She says the business is very lucrative and one can build up to three houses with this business (with a house ranging up to more than 12 million Naira* [~31,000 USD]). However, beyond economic reasons, cultural beliefs associated with the issue of one's destiny among the Yoruba has been identified as a reason for participation in the profession of herb selling (Agunbiade *et al.*

2012), which often accompanies IWT. For instance, one illegal wildlife trader (not a trader of vultures) stated the following: "*I was a bus conductor in Ikorodu, Lagos when an elder told me I should do my family business and that that is where I will have my breakthrough in life"* (Ijebu-Ode, Male, 36 years old). An apprentice stays in a trader's shop and learns the trade for upwards of 7 years, after which they go and start their own wildlife trade business. The horizontal transmission of the cultural practice seems to provide a multiplier effect in the spread of the illegal trade in vultures since many persons can be taught in the lifetime of a trader compared to one child for instance, in the case of vertical transmission. The case of horizontal transmission among traders of vultures and their body parts in Nigeria is also confirmed by Saidu and Buij (2013) where they report that 8% of traders in their study learnt the practice from others outside their family.

### IV.3.3. Social support

Social support is used to represent the support received from members of the trade association, *Elewe-Omo*. Heaney and Israel (2008:191) define social support as "aid and assistance exchanged through social relationships and interpersonal transactions", often manifested as emotional aid, financial aid, and companionship (Wellman and Wortley 1990). These components are in line with the kind of support traders of vultures receive from *Elewe-Omo* membership. In relation to RQ1, since the main objective of the *Elewe-Omo* is to sell wildlife parts, and only existing traders (for majority of traders, vertical transmission of cultural traits that influence behavior to practice the trade has since occurred before membership of *Elewe-Omo* because these traders were born into the profession or taught from childhood) can join the association, it is unlikely that this form of social support influenced traders to engage in the practice. But social support does expand social influence within the group. Social influence from a sociocultural context comprises attitudes, beliefs, norms etc. that all influence people's behavior (Cinner 2018). For social norms, people are

accustomed to do what is popular and what should be done (Cinner 2018). This may explain the reason behind group continuity of the *Elewe-Omo* Association. The following are exemplar quotes illustrating social support among traders of vultures in the study area.

*When any member has a problem, the Elewe-Omo association stands together on behalf of that person* (Trader 4, Abeokuta, Female, 49 years old).

*The benefits are many: We support each other on pilgrimage to Mecca for example. Those who do not have money can borrow from Elewe-Omo Association. If we want to buy a car, they can give us a loan of half the price. If someone in the association wants to get married, they are given a cash gift. Every 8 days each trader pays a levy of 100 Naira to the association* (Trader 2, Ilorin, Female, 40 years old).

From the quotes above, traders of vultures and their body parts receive social support through their membership of *Elewe-Omo*. The association serves as a safety net when members need loans, want to mark important life events, settle disputes, and it also lends emotional support. The codes under social support as indicated in Table 5 above will now be discussed.

**IV.3.3.1. Render help**

Several respondents mentioned receiving help from the *Elewe-Omo* Association in various ways. For instance, one respondent stated: "*When the government makes a provision for us, the association enables that provision to reach us*" (Trader 9, Abeokuta, Female, 45 years old). There is also a sense of comradeship within the group, as traders mentioned they help each other in the face of challenges. For example, one respondent stated: "*When a member has a problem with her business, we assist her*". (Trader 3, Ibadan, Female, 30 years). When traders have life marking events like weddings, burial ceremonies, ordinations etc. other traders lend support and attend

these events in solidarity. For instance, one respondent stated: "*When we have something to do, as members of Elewe-Omo we help each other*" (Trader 7, Ilorin, Female, 48 years old). In terms of ensuring ethics in the trade, the *Elewe-Omo* also renders help in monitoring its members. For example, one respondent stated: "*The Elewe-Omo helps in monitoring of all its members so that there is honesty in trade*" (Trader 1, Ijebu-Ode, Female, 86 years old). It is reasonable to suggest therefore that the help that *Elewe-Omo* renders is instrumental in ensuring membership commitment and continuity.

#### IV.3.3.2. The importance of the Elewe-Omo Association

Most wildlife markets in southwestern Nigeria are nested within larger urban markets. These urban markets have trade unions, and some wildlife traders are members of both the trade union and the *Elewe-Omo* Association. The difference between both institutions is that while the trade union is made up all types of traders specializing in food, plastics, clothes, cooking utensils, etc., the *Elewe-Omo* is for wildlife and herbal traders only. It is likely that gaining membership of *Elewe*-Omo is the same with other trade associations. Every 8 days, each trader pays a levy of 100 Naira (0.24 USD). For those wildlife traders that have both memberships of trade unions and *Elewe-Omo*, they mentioned that between the two institutions, the *Elewe-Omo* is more important for influencing them to sell wildlife parts. This is understandable given *Elewe-Omo* is a group of like-minded traders with common interests and the same profession. Further, this group provides social support to its members, sustaining ambitions and interests in the wildlife trade. The implication of these is that the *Elewe-Omo* does play an important role in the life and profession of these traders which fosters their allegiance.

#### IV.3.3.3. Financial aid

Some respondents mentioned receiving financial aid from *Elewe-Omo.* For instance, one respondent stated: "*We make contributions for savings that we use in collective purchases*" (Trader, Abeokuta, Female, 28 years old). Another stated: "*Members sponsor their children's education to university level, we buy cars, we build houses, and we go on pilgrimage.*" (Trader 3, Ilorin, Female, 40 years old). The *Elewe-Omo* also gives financial aid to establish less successful traders. For example, one respondent stated: "*For those who are not established in business, they are assisted*" (Trader 3, Ilorin, Female, 40 years old). The group provides succor and a safety net in terms of finances, and this could be one of its most pivotal roles in fostering group membership, cohesion, and sustainability.

#### IV.3.3.4. Emotional support

Emotional support comprises expressions such as caring, concern, empathy, and sympathy (Ko *et al.* 2013). Traders mentioned receiving emotional support as members of *Elewe-Omo.* For example, one respondent stated: "*We feel concern for each other and if there is any issue, we assist each other*" (Trader 1, Ibadan, Male, 40 years old). Other responses stated include: "*We cooperate and work together in love*" (Trader 3, Ilorin, Female, 40 years old); "*If somebody has a problem in their work, like harassment for example, the association stands up for that person*" (Trader 7, Ibadan, Female, 57 years old). The psychological benefits and succor from the *Elewe-Omo* would contribute to long-term memberships and a strong allegiance by traders of vultures and wildlife parts.

#### IV.3.3.5. Settle disputes

Respondents mentioned the role of *Elewe-Omo* in settling disputes among them and in their relations with buyers. For example, the following were stated by two different respondents: "*Once*

*traders have dispute with customers, the association helps to settle it*" (Trader 6, Abeokuta, Female, 28 years old); "*There are many benefits in being a member of the Elewe-Omo Association. For instance, if there is a fight in the market, the association settles the dispute*" (Trader 8, Ibadan, Female, 45 years old). Settling disputes has a core function in ensuring continuous unity among traders and therefore the longevity of the association and sustained contribution from its members.

Overall, these features of social support as mentioned by vulture traders may suggest the role of *Elewe-Omo* in sustaining the illegal trade in vultures and other wildlife in the study area.

## IV.4. Buyers: Socio-cultural factors

Following the same procedure of analysis of traders' interview scripts, codes were identified in the interview scripts of the buyers and categorized into themes. The codes along with their corresponding generality and frequencies are presented (Table 7). Codes were sorted into broader categories and themes (Tables 8 & 9). Apart from data from general buyers, an herbalist and an *alfa's* (Islamic scholar) responses on the primordial myths surrounding the vulture and its uses are hereby presented to give context to this section.

**Table 7. Buyers: Codes, description, generality, and frequencies**

| Code | Description | Generality | Frequency |
|---|---|---|---|
| Ancestors passed traits | Ancestors passed down the use of vultures | 4 | 4 |
| Teach others | Buyer teaches others how to use vultures | 3 | 3 |
| Taught by parents | Parents taught buyers about vulture use | 2 | 2 |
| Taught by peers | Peers taught buyer about vulture use | 1 | 1 |
| Inherited the use of vultures | The buyer inherited the use of vultures | 1 | 1 |
| Taught by uncle | Uncle taught buyer the use of vultures | 1 | 1 |
| Taught by father | Father taught buyer how to use vultures | 1 | 1 |

**Table 8. Buyers: Categories**

| Cluster 1: *Vertical transmission (9)* | Cluster 2: *Horizontal transmission (4)* |
|---|---|
| Ancestors passed traits *(4)* | Teach others *(3)* |
| Taught by parents *(2)* | Taught by peers *(1)* |
| Inherited the use of vultures *(1)* | |
| Taught by father *(1)* | |
| Taught by uncle *(1)* | |

**Table 9. Buyers: Theme**

| Cluster 1: *Cultural transmission (13)* |
| --- |
| Vertical transmission *(9)* |
| Horizontal transmission *(4)* |

Similar to traders, according to statements from **buyers**, *cultural transmission* was a significant determining factor in influencing behavior, which is a combination of both *vertical* and *horizontal transmission*.

### IV.4.1. Vertical transmission

Cultural and religious beliefs in the form of primordial myths and perceived medicinal uses of vultures are vertically transmitted in buyers' families. This is illustrated by the following quotes below:

*I was born into it. I inherited it from my father who practiced it* (Buyer 1, Ire, Male, 70 years old).

*Our forefathers told us about vultures and their use* (Buyer 2, Ibadan, Male, 60 years old).

*From five generations ago, we have learned about vultures* (Buyer 3, Saki, Male).

*My father taught me what one can use vultures to do. I tested it and saw it was true* (Buyer 6, Abeokuta, Male, 35 years old).

These cultural traits are transmitted through storytelling, demonstration, and modeling (Garfield *et al*. 2016). Garfield *et al*. (2016) report that religious beliefs and practices are primarily transmitted from adults to a younger generation and teaching through storytelling and demonstration is the process by which young ones acquire religious-based knowledge. Cultural traits passed in this way are usually conservative, unlikely, or slow to change as children grow

older (Guglielmino *et al.* 1995). This explains why buyers, as shown in the exemplar quotes above, persist in this practice of belief-based use of vultures after so many years. The foregoing could be an important opportunity to foster new cultural traits for the next generation as would be demonstrated in section V.3.

### IV.4.2. Horizontal transmission

The following responses below seem to suggest that horizontal transmission of cultural and religious beliefs and practices concerning vultures are also passed on to unrelated persons outside the family in the case of buyers.

*All those that sell and those that buy, and from those that gave birth to us, and we have gone around the town and heard from others* (Buyer 1, Ire, Male, 70 years old).

*They recommended it for me to use and so definitely, I will need to recommend it for other people* (Buyer 5, Abeokuta, Male, 43 years old).

*We recommend to a friend if he has a similar problem that vultures can solve. And God blesses the work* (Buyer 6, Abeokuta, Male, 35 years old).

Like vertical transmission, it is plausible that in horizontal transmission from a buyer, cultural traits are also passed through storytelling, demonstration, and modeling. For example, buyers can share with unrelated persons, stories of the superhuman power of vultures in their lives or the lives of others, demonstrate how vulture parts are used for magico-religious purposes and live an exemplary life in the use of traditional medicine or upholding the ancestral culture. Although the efficacy of this pathway of transmission compared to vertical transmission in this context is unknown, Guglielmino *et al*. (1995) have observed that through horizontal transmission, cultural change can be rapid and is a frequent pathway of innovation.

### IV.4.3. Single Buyer Who is an Herbalist

Primordial myths are a core aspect of Yoruba culture and explain the basis of iconization of some wildlife, such as the vulture (Adeduntan 2019). One herbalist described this story about the vulture:

> *"In the beginning when the world was in confusion and there was no dew and rain and all the rivers were dry, our ancestors made consultations with the oracle. And the oracle told them to make a sacrifice and that the sacrifice must be taken to heaven to Olodumare, the creator. They were told to take the sacrifice to heaven and none of the ancestors could fly. They called all the birds who assembled. Who will go on an errand to heaven? None of the birds could go. Only the vulture volunteered to go on this mission. The vulture flew with the sacrifice to heaven to meet the creator and the problem on earth was solved.*
>
> *When the vulture was about to go on the assignment, it demonstrated, dancing and spreading its wings and then put its head under the sacrifice and flew to heaven. This is what made the vulture's head bald. Therefore, a Yoruba proverb goes thus: "It was an assistance the vulture rendered that made the vulture have a bald head"".*

Adeduntan (2019) confirms the above primordial myth about vultures in a similar story where the vulture plays a redemptive role for the Earth. These mythical beliefs and behavioral and morphological characteristics of vultures make them an iconic species among the Yoruba. For instance, one respondent stated, *"The errand we send vultures, another bird cannot go on that errand"* (Buyer 6, Abeokuta, Male, 35 years old) and "*It is used for spiritual care. The head and the body parts are used for different reasons. The live and dead body are used for different things. If we find someone whose wealth is small, the vulture in addition to other things can be used to*

*increase wealth. According to its name, the Yoruba use it for long life. If we find someone spiritually attacked, whether in the dream or in real life, the vulture is used to stop it*" (Buyer 6, Abeokuta, Male, 35 years old).

The story from the herbalist is related to the aim of this study to understand how socio-cultural influences have shaped and might change the behavioral patterns of traders and buyers of vulture parts for belief-based use, in showing how cultural traits such as beliefs about the iconic role of vultures are transmitted through storytelling of primordial myths in families of buyers or consumers of vulture products for belief-based use. These beliefs influence the behavior of buyers to idolize the vulture and therefore use it in solving myriad problems as shown in the *alfa's* respondence below.

On the other hand, these stories that iconize vultures could be an important opportunity to foster respect for vultures in a way that protects them from further persecution and trade. For instance, there is a saying among the Yoruba which states *"a ki pa igun, a ki je igun, a ki fi igun bori"*. This translates as: "we do not kill the vulture; we do not eat the vulture and we do not use the vulture as sacrifice to the gods to remedy human destiny" (Adewoye 2007: 54). It is important to understand why the users of vulture parts have ignored this saying concerning the vulture. While the cultural iconization of vultures is preserved, the non-killing traditions concerning these birds have eroded. It is not clear why this is so, however, culture is dynamic and evolutionary in nature (Kashima 2014; Hamedani and Markus 2019). Kashima (2014) notes four basic sources of cultural dynamics exist, namely, 1) Importation, which refers to novel cultural information not in prior existence in a given culture but existed in another culture and is then introduced to the former culture through transmission from the latter, 2) Invention, which is novel cultural information without a history of existence in the culture of a group and is introduced to the culture without

importation, 3) Selection, which is cultural information selected *in* to be reproduced further or selected out to be deleted from a culture, and 4) Drift, which refers to the way in which random processes create a transformation in prevalence of cultural information over a period. Nevertheless, these stories and proverbs about vultures may have utility to reinforce social norms that benefit vultures by restoring the non-killing traditions concerning these birds in Yoruba communities (see section V.3).

### IV.4.4. Single Buyer Who is an *Alfa*

Below, magico-religious uses of vultures are given by an *alfa*.

"*1. a. The vulture's head is useful for increasing business success, it is used for spiritual power, for knowledge etc.*

*b. The legs are used as defense against charms for leg injury, to damage somebody's life, etc.*

*c. The left wing is used for love charm.*

*d. The right wing is used for good fortune (lucky star)*

*e. The flesh is used to prevent infidelity in women, and for debt recovery.*

*f. The feather is used in separating individuals from their families, dividing husband and wife, driving someone from their home or if someone wants to fly spiritually.*

*g. The feces is used for separating people just like the feather and used for deliverance.*

*2. There is no bird that can be used in place of vultures. The vulture feeds on the flesh of any animal including humans, which makes it very powerful. The vulture must be in existence or there will be sickness in the Earth. You can never use an herb in place of a vulture.*"

Islam among the Yoruba permits syncretism which is widespread in southwestern Nigeria (Balogun 2011). According to the Cambridge Dictionary (Cambridge University Press 2021), syncretism is "the combining of different religions, cultures, or ideas". West Africans (originally practitioners of Traditional Religion) appealed to the Arabic script on its arrival in the ninth century because of its use in magico-religious practices including amulet writing (Mommersteeg 1990). This played a significant role in the initial stage of Islamization among West Africans (Mommersteeg 1990). It may have been because magico-religious practices in the introduced religion, Islam, mirrors similar practices in Traditional Religion among West Africans. For instance, the use of charms and amulets among the Yoruba has been documented (Jegede 2002; Borokini and Lawal 2014). In fact, early Portuguese observed Africans wearing charms and amulets and named what they saw as *feitico* meaning fetish (Awolalu 1976). The fetish uses of vultures endorsed and practiced by *alfas* shows syncretism in Islam among the Yoruba, and suggests that the combination of Islam and Traditional Religion among this ethnic group has a role in supporting beliefs that influence the behavior to use vultures or sell them.

Other studies have identified similar uses of vultures and their body parts (Nikolaus 2011; Saidu and Buij 2013). These uses affirm the iconic role of vultures among Yoruba people. As has been stated in section IV.4.3., the many fetish uses of vultures suggest how their idolization through primordial myths and religious beliefs has led to their utility for magico-religious purposes. For instance, Olusola (2005) observes that the Yoruba believe animals are divine and their divinity demands reverence and honor. Similarly, in India, Kushwah *et al*. (2017) report the veneration of the domestic cow among traditional Hindu societies and where their dung and urine are smeared on the floor of houses for sanctification. Body parts of other species are used for religious rituals and to drive away perceived evil spirits (Kushwah *et al*. 2017).

## IV.5. Summary

This chapter gave a brief introduction, followed by an analysis of socio-demographic data of interviewed traders of vulture parts. The analysis showed that the mean age of traders is 47 years, Muslims had the highest frequency among traders, women traders were significantly more represented than men, only indigenes are those who take part in the trade, and the level of education with the highest frequency was SS3, followed by Primary 6. Next was a presentation and critical discussion of the data from the research with cultural transmission and social support identified as sociocultural factors that influence the behavioral patterns of traders of vultures in the study area. Cultural transmission was also found to influence the behavior of buyers of vultures. Overall, these results indicate the behavioral drivers of traders and buyers of vulture parts and other ancillary factors as reported, having utility in administering behavioral change interventions that could minimize the illegal trade in vultures. This is discussed in the next chapter.

# Chapter V: Minimizing the Vulture Trade

## V.1. Introduction

The findings from Chapter IV which address RQ1 are the basis for tackling RQ2 which this chapter focuses on, i.e., to determine how the vulture trade can be minimized. Cultural transmission was identified as a major socio-cultural factor influencing participation in the trade of vultures and I discuss how the theoretical foundations and explanations of the Cultural Transmission Theory suggest potential solutions. Cultural change that is pro-vulture can be instigated through horizontal (person to person) or one-to-many (teacher or leader to group) mechanisms of cultural transmission (Guglielmino *et al*. 1995). Therefore, the Cultural Transmission Theory and engagement with relevant literature serves as the lens through which the findings in Chapter IV are filtered to give informed proposals on how pro-vulture change can be achieved. It is important to note that these proposals have not been directly tested in my study. Based on interviews of staff of the Federal Ministry Environment, I also present and critically discuss the regulatory framework for controlling the illegal trade in vultures in Nigeria, highlighting possible solutions. I then look at the future of belief-based use of vultures in Nigeria and West Africa.

## V.2. Cultural transmission: Engaging religious opinion leaders to instigate cultural change

The one-to-many (opinion leader to group) approach in cultural transmission has been associated with innovation of cultural information, influencing change in behavior in individuals in groups, networks, and society through opinion leaders (Guglielmino *et al*. 1995; Valente and Davis 1999; Valente and Pumpuang 2007). Even though most of my sampled vulture traders entered the wildlife trade via matrilineal influences (vertical cultural transmission), there is evidence to

suggest that their behavioral change to stop selling vultures can result from the one-to-many approach. As has been mentioned in section III.6.2., it is important to note that matrilineal transmission is of the larger wildlife trade not singularly the vulture trade per se as traders sell a variety of wildlife parts. Thus, there is a greater possibility for the one-to-many approach (opinion leaders) to influence wildlife traders to stop selling vulture parts along with other wildlife parts if they look up to these leaders as role models. For example, van den Ban's (1963) study of a community of farmers in Netherlands showed the importance of opinion leaders influencing farmer's behavior in place of their personal assessment of the situation. He revealed that small-scale farmers imitated the farming practices of large-scale farmers who were opinion leaders of higher social status even when these practices were visibly unfit for their peculiar circumstances. In Nigeria, as would be elaborated later in this section, Walker *et al.* (2019) show that conservative Muslim opinion leaders when converted into advocates for maternal, newborn, and child health (MNCH) services, succeeded in spreading MNCH reception among Muslim healthcare workers. These healthcare workers hitherto were not open to change due to prevailing cultural and religious beliefs that did not sanction these MNCH services. Opinion leaders therefore provide access and legitimation to conductors of intervention programs and grant communication from their communities back to change agents (Valente and Pumpuang 2007). They can also serve as role models for behavior change within target audiences and can be a carrier of behavior change messages (Valente and Pumpuang 2007). Further, they may serve as 'back-up' after the program change agents have left the community, thus institutionalizing program goals (Valente and Pumpuang 2007). Finally, the mechanism of transmission by opinion leaders is the most rapid form of cultural change facilitation (Guglielmino *et al*. 1995). Opinion leaders therefore have the potential to stop vulture selling which is part of the larger wildlife trade practice passed down

through generations in the families of traders, and transmitted and received to and from unrelated persons.

Muslim opinion leaders have the potential to be powerful messengers of conservation among the Yoruba community of traders of vulture parts. For instance, the Quran and Prophet's *Hadiths* (teachings) contain conservation principles including respect for creation, protection of nature and sustainable use (Kula 2001). Consistent with the results of previous research (Awoyemi 2014), I found that Muslims are the majority (93.3%) among sampled traders of vulture parts in the study area. Moreover, the existing values of a target community are important for effective behavioral change interventions (Thomas-Walters *et al*. 2020). Values in this context mean what is desired that influence how people select action and evaluate occurrences (Schwartz and Bilsky 1987), knowledge of which will aid conservation managers to facilitate pro-conservation behavior that is culturally acceptable. Everyone has values, attitudes, motivations, and judgements and these are often shaped by religious beliefs (Awoyemi *et al*. 2012), which are often shaped by religious leaders (Welch *et al.* 1993). Further, as stated in section II.3.3., non-natural religious beliefs elicit profound epistemological and emotional fidelity (Norenzayan and Atran 2004). Therefore, religiously rooted cultural transmission contents toned by emotions are more likely to be transmitted along with a higher chance of being remembered (Norenzayan and Atran 2004). It is therefore reasonable that a Yoruba Muslim religious leader could serve as an opinion leader from the community of traders of vulture parts. Wald and Calhoun-Brown (2007) have argued that religious leaders are also opinion leaders because of their ability to conceptualize ideas and communicate those ideas via religious culture and they have access to institutional resources. Anthropologists understand religion to be a primary regulator of people's behavior (Rappaport 1979, 1999). Religion in most societies is the primary conduit through which right and wrong is

defined (Negi 2005; Awoyemi 2008) and has the capacity to help translate scientific ideas, which may be foreign to indigenous cultures, into worldviews that are more easily accessible and admissible by local communities (Mcleod and Palmer 2015). Therefore, targeting an individual's religious worldview may be a more effective avenue to persuade people towards pro-conservation behavior (Awoyemi *et al*. 2012). For example, Hmielowski *et al.* (2015) discovered in their study that hearing about environmental protection at a religious event heightened people's concerns about the environment. They also found out that there is a correlation between greater environmental concern and engagement in energy saving behaviors and the discussion of environmental issues with other people. These relationships were dependent on the strength of the religious beliefs of people based on an examination of whether the strength of these beliefs moderated the connection between listening to messages about environmental protection and environmental concern (Hmielowski *et al.* 2015).

Another successful example in the bridging of religion and conservation is seen in the significant first step aimed at controlling the IWT in Indonesia. In 2014, Islamic clerics issued a religious decree called *fatwa*[8] against IWT and all actions leading to wildlife extinction in the country. This was an outcome of the partnership between the Alliance of Religions and Conservation (ARC), World Wildlife Fund (WWF)-Indonesia and the Indonesian Council of Ulema (Mcleod and Palmer 2015). Although the conservation effectiveness of this action remains to be seen (Mcleod and Palmer 2015), it is an initial step to engage the values, motivation, and religious worldview of the people and therefore eliciting pro-conservation behavior. A further example is from Misali Island, Tanzania, where coral reefs and critical turtle nesting sites were threatened by harmful dynamite

[8] The *fatwa* is a non-binding regulation for those interested in adhering to its instructions. It answers the questions of Muslims as per grey areas in obedience of Islamic law and it is doctrine derived from Islamic teachings (Mangunjaya and Praharawati 2019).

fishing techniques. In reaction to this, in 1998, the government banned dynamite fishing in the island, declaring it a protected area. However, efforts to conserve the area failed and food and livelihood opportunities of local communities were threatened. Intervention from the Islamic Foundation for Ecology and Environmental Science, ARC and WWF helped the community to extract conservation principles from the Qur'an and show that harmful fishing practices were illegal according to Islam. This enabled a stop to the destructive fishing practices and successful conservation of the area (Mcleod and Palmer 2015).

Religious leaders in other mainstream faiths have also demonstrated a commitment to conservation issues. For example, Pope Francis on his trip to Kenya in 2015 declared the end to illegal trade in natural resources as a moral imperative (Bale 2015). In the Buddhist tradition, the Dalai Lama has highlighted the importance of conservation and in 2005 launched a campaign by Care for the Wild International and the Wildlife Trust of India to tackle IWT along Tibet's border with India and Nepal (Office of The Dalai Lama 2006). In 2006, the Dalai Lama made a call to ban the use of tiger and leopard skins in Tibet and thousands of Tibetans responded by burning their animal skins in a huge bonfire (Office of The Dalai Lama 2006).

There is evidence in other disciplines such as public health that engaging religious leaders for behavioral change in communities is possible and could be a model for conservation (Awoyemi 2008; Agwu 2021). For example, in Sierra Leone, the United Nations International Children's Emergency Fund had a 2-year collaboration with Muslim and Christian leaders that increased immunization of children under the age of 1 year from 6% to 75% (Zarocostas 2004). In Indonesia, the *fatwa* was instrumental in the success of the Family Planning Movement and was so outstanding that President Suharto was invited to the UN Session to narrate his experiences (Mangunjaya and Praharawati 2019). The role of religious leaders was also vital to the success of

HIV/AIDS prevention activities in Senegal (UNAIDS 1999). AIDS prevention was regularly part of Friday sermons in mosques throughout the country and religious opinion leaders steered discussions on this topic on television and radio (UNAIDS 1999). The adoption of information, education, and communication methods (IEC) as a prevention strategy by religious leaders, where IEC activities had a religious tone to their messages, contributed to an increase in knowledge of HIV/AIDS (Onyango 2001). In 1997, 90% of the population became better informed about HIV/AIDS with knowledge about all the means of protection (Onyango 2001). In the same year, overall national prevalence fell to about 2% from 15.9% amongst hospital patients, in 1993 (Onyango 2001).

Similarly, new cultural information that involve refusal to sell vulture parts can be propagated through Muslim clerics respected by vulture traders in southwestern Nigeria. Religious leader intervention for behavioral change among Muslims in Nigeria has been successfully demonstrated in the health sector (Olivier 2016; Walker *et al*. 2019). For example, Walker *et al.* (2019) report on the impact of Muslim opinion leaders' training of healthcare workers on the reception of MNCH services in northern Nigeria. Spreading access to MNCH provisions in traditional communities is a public health challenge, mostly due to the influence of cultural and religious beliefs about what is sanctioned or not sanctioned within a religious group (Walker *et al.* 2019). This is characteristic of the Muslim majority of northern Nigeria, who are deeply suspicious of Western public health schemes, combined with an ailing and poorly funded health system, eliciting the rising of a new generation of Muslim opinion leaders with opposing narratives about family planning, immunization, and nutrition programs (Walker *et al.* 2019). Therefore, as part of the Saving Lives at Birth global partnership program, conservative Muslim opinion leaders were converted into champions who served as health communicators in training health workers on the appropriate

religious principles related to MNCH (Walker *et al.* 2019). Consequently, healthcare workers' performance in control health facilities was compared with those that received intervention efforts. Results show a significant positive variation in perception and practices between healthcare workers in intervention and control programs, as relates to MNCH reception (Walker *et al.* 2019). So, in engaging Muslim leaders/clerics for mutual dialogue, conservationists can emphasize the moral and ethical dimensions of losing a part of Allah's creation. For instance, creatures perform acts of worship, praising God and bowing down in adoration as God declared in the Quran (22:18): *Seest thou not that to God bow down in worship all things that are in the heavens and on the earth — the sun, the moon, the stars, the hills, the trees, the animals ...* (Kader *et al.* 1983), signifying their value to God. Islam also sees all creatures as part of similar communities to humans', as God declared in the Quran (6:38): *There is not an animal (that lives) on the earth, nor a being that flies on its wings, but (forms part of) communities like you* (Kader *et al.* 1983). Further, Islamic principles embody the human role in conserving nature, such as *khalifah* which means stewardship of Allah's creation (McKay *et al*. 2013). Based on these, conservation managers and policy makers can begin mutual dialogue with Muslim leaders/clerics on promoting vulture conservation in southwestern Nigeria. If conservationists engage with the values and motivations of the illegal wildlife traders and work within cultural systems, it may help avoid the perception that they are imposing an imperialist or hegemonic ideology and facilitate smooth uptake of conservation principles. However, it requires identifying Islamic clerics who are amenable to pro-vulture messaging. This may be resolved by finding a conservationist team member who is a Yoruba Muslim to serve as liaison between the team and the Muslim cleric(s). Further, Islamic clerics are already speaking out against a resurgence of beliefs in family deity or family cultural beliefs in

Ilorin for instance which are parallel with trade in or belief-based use of vultures (The Eagle Online 2021).

A model named the *Leadership Development Model for Muslim Opinion Leaders* developed within the health sector can be adapted to help conservationists engage Islamic clerics (Walker 2015; Figure 11). This model did not provide a 'silver bullet' solution in engaging Islamic opinion leaders on child marriage in Nigeria, in that they stopped short of putting forward 18 as the least age of marriage for Muslims despite the leadership intervention. However, there was an agreement on the need for marriage to be postponed until after secondary school or arrival of maturity (Walker 2015). Similarly, such an approach, when used by conservationists could involve four processes to instigate behavior change by Islamic clerics and cooperation to be ambassadors in changing the attitudes and practices of traders of vulture parts. The first step would involve the recruitment of Muslim opinion leaders and the fostering of a relationship based on trust. This would be followed by educating Muslim clerics about the problem of vulture declines and the urgency of halting IWT and how all these can be shared with the Muslim community of wildlife traders. Next would be participatory workshops that identify the scriptural basis of vulture conservation (see Kader *et al.* 1983). Once this foundation has been established with Muslim clerics, they would then work to communicate messages to the community of wildlife traders to stop selling vultures and their body parts.

It is important to note that this community of wildlife traders can be accessed through their association, *Elewe-Omo*, a platform through which traders mobilize themselves and relate with government. This would be advantageous for the following reasons: 1. Muslim clerics would be respecting the institutional protocol and arrangements in the wildlife market and therefore gain cooperation. 2. Muslim clerics would have access to majority of the traders in an organized and

localized manner thereby making outreach efforts more efficient and effective. 3. Muslim clerics would have access to the utility of social support within *Elewe-Omo* in spreading new social norms throughout the association. This is based on the assumption that a significant part of the association would buy into the message by the Muslim cleric and therefore spread the social norm since people are used to doing what majority are doing and what should be done (Cinner 2018).

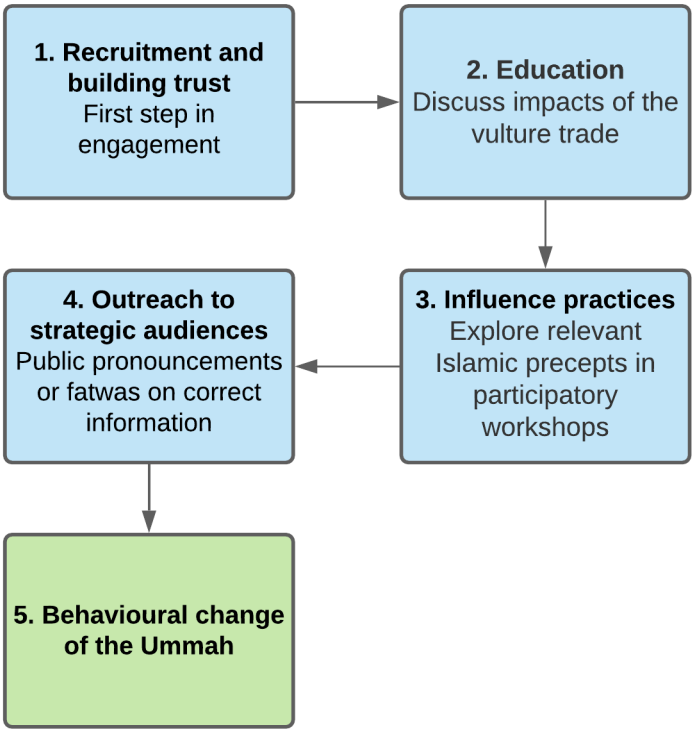



**Figure 11. Model for engaging Muslim opinion leaders to facilitate behavioral change of traders of vultures.**

Further, the finding in section IV.2.4 that all respondents' places of origin are from the same city in which they sell is supportive of the foregoing proposal. Muslim opinion leaders, conservation managers and policy makers can design their behavioral intervention programs to be more targeted, focusing on indigenous traders selling vulture parts in each specific city with whose culture they are familiar with because they are from the region. The traders can also be more easily

monitored to evaluate the impact of interventions. Even more importantly, since vulture traders only trade in their hometowns, there is a possibility that they would be more receptive to local Muslim opinion leaders from the same hometown.

Section IV.2.3. shows the vulture traders to be mostly women. The fact that these are also mostly Muslim women presents an opportunity for Muslim opinion leaders, policy makers and conservation managers to employ gender specific engagement approaches. For example, women are driven by their needs as mothers to care for their children. In this context, Muslim clerics, policy makers and conservation managers could supplement their behavioral intervention programs with avenues to boost women's progress towards realizing this innate desire. For instance, program managers could seek funding to offer scholarships and job opportunities to the children of these women. This way, the burden on the traders would be lessened and thereby likely elicit greater cooperation.

Considering the foregoing, a Theory of Change that outlines integral pathways to the overarching goal of halting the selling of vultures is presented in Appendix 2 to locate this proposal within contemporary conservation planning.

### V.3. Cultural transmission: The role of storytelling in generating new familial values

Anthropologists have identified storytelling as one avenue through which cultural transmission is passed through generations (Garfield *et al.* 2016). Religious beliefs and practices such as belief-based use of vultures is vertically transmitted primarily from adults to younger generations through storytelling and demonstration (Garfield *et al.* 2016). The art of storytelling may be as old as humanity itself (De Groot and Zwaal 2007) with humans being evolutionarily hard-wired to listen to stories to find meaning, inspiration, role models and archetypes (Rankin *et al.* 2007). Storytelling is deemed more impactful than writing or video because of the instantaneous contact

and response, with rhythm and emotional communication (Rankin *et al.* 2007). Stories encompass the beliefs and values of a culture and represent patterns for living and behaving, conveying, and maintaining cultural identity even as these stories evolve (Rankin *et al.* 2007).

Oral literature is used in the transmission of culture among the Yoruba, a practice that is common to other indigenous communities in other parts of Nigeria and Africa (Sanu 2020). Yoruba inculcate values, virtue, history, and tradition in their children through storytelling (Ojo 2019; Sanu 2020). They believe that children should be trained to secure a good posterity. For example, there is a saying in Yoruba that goes thus: "*Ọmọ tí a kò kọ́, ni yóò gbé ilé tí a kọ́ tà*," meaning the child that is not well trained will eventually squander the hard-earned money of the parents (Sanu 2020: 14). In Yoruba cultural settings, two types of folktales exist, with one paving way for the other during storytelling. These are: 1) riddles (*Alo Apamo*) and 2) prose narratives (*Alo Apagbe*) which contain proverbs (*Owe*) (Adebayo 2010). Folktales show how indigenous peoples in Nigeria have a close connection with nature and bring traditional religion to the attention of the audience, where God, humans and nature are one and where people have nature in veneration (Ojo 2019).

These folktales illustrate the route and process of cultural transmission and are therefore instructive in constructing new values that are pro-vulture through the same mode of transmission, storytelling. Cultures are not static; they evolve (Guglielmino *et al.* 1995; Kashima 2014; Hamedani and Markus 2019). In fact, there is great opportunity in using metaphors and parables in communication strategies to give rise to pro-nature behaviors (Cowling 2020). Stories could be a basis for local attitudes and the intergenerational transfer of values that are pro-vulture, provided these stories are indigenous, expressing local cultural values, beliefs and knowledge that are different from western worldviews (Fernandez-Llamazares and Cabeza 2018) but informed by universal scientific principles (Dickman *et al.* 2015). For example, conservationists in Cameroon

demonstrate how fictional storytelling may facilitate local response to conservation issues in liberty, where there is authentic community participation, reduction of power differences and the local voice is heard (De Groot and Zwaal 2007). These stories make people draw their own conclusions, think on their own, and immediately establish truth as real and put it in their memory (Hunt and Wilson 1975).

In Ranomafana National Park, Madagascar, an IUCN funded project entitled *Echoes of the forest* (*Akon' ny ala*) using storytelling, connected lemur conservation with the culture of local Betsileo and Tanala communities around the park via a 10-episode radio series (Fernandez-Llamazares and Cabeza 2018). These stories promote lemurs as a community pride and foster emotional connections with the forest. Similarly, indigenous stories are applied in promoting intergenerational communication about wildlife by a project in Sibiloi National Park in Kenya, which aimed at helping young Daasanach (the local ethnic group) to document indigenous wildlife stories from their elders, thereby restoring traditional knowledge of younger generations and connecting children to stories that are disappearing (Fernandez-Llamazares and Cabeza 2018).

In other spheres, storytelling has been identified as instrumental in transmitting cultural family values to family members and other stakeholders in family corporations (Zwack *et al.* 2016). For conservationists aiming to instigate behavioral change among buyers of vultures who have been influenced by stories from parents or unrelated persons, the following parallel lesson in public health may be noteworthy. In the USA, based on little or no evidence to support claims of vaccine harm, anti-vaccine activists have utilized storytelling to influence parents to fear and doubt vaccine usage (Shelby and Ernst 2013). On the other hand, approaches utilized by public health officials to counter the anti-vaccine movement has been the use of statistics, research and other evidence-based information transmitted verbally or in the form of Vaccine Information Statements given to

parents prior to vaccinations (Shelby and Ernst 2013). However, these tools may not be sufficiently effective to singularly persuade vaccine reluctant parents that vaccines are safe, effective, and important for the health of their children (Shelby and Ernst 2013). Combining story and science - where some of the storytelling approaches used by the anti-vaccine movement plus evidence-based vaccine information - has been demonstrated to show potential to give scientists and pro-vaccine parents a chance to raise a greater standard against anti-vaccine messaging, which depends almost completely on personal stories (Shelby and Ernst 2013).

It has been observed by health professionals that public health intervention programs may be unsuccessful for several reasons, part of which is a lack of cultural appropriateness (Houston *et al.* 2011). Based on emerging evidence, storytelling has been identified as a distinctive avenue to advance evidence-based choices in a culturally relevant context (Houston *et al.* 2011). Social psychologists have described the possible role of narratives in resolving resistance – a person's stance in defending an attitude against transformation (Dal Cin *et al.* 2004). Using a culturally sensitive storytelling intervention for African Americans suffering from hypertension, in a randomized sample of 299 patients, scientists discovered reduction in blood pressure favored the group that received the storytelling intervention (Houston *et al.* 2011). Patients who had uncontrolled hypertension and received the storytelling intervention experienced an 11-mmHg greater reduction in blood pressure than the control group (Houston *et al.* 2011). The foregoing suggests the positive influence storytelling had on behavioral change probably because of the homophily between patient and storyteller (Houston *et al.* 2011).

Based on these examples, it is possible to co-develop a conservation project with local Yoruba communities in the study area to restore the non-killing traditions concerning vultures through storytelling as explained in section IV.4.3. These stories could target families in Yoruba

communities in the study area, especially buyers of vultures, to inspire new familial values among elders and children. Following the approach of De Groot and Zwaal (2007), stories that portray the cultural signature of the Yoruba, carry few implicit messages, and present a dilemma to generate meaningful discussion could be developed. The justification for recommending such an approach is to create a level playing field between conservation managers and local community members, engender trust, participation, and opportunities for community voices to be heard. Stories would especially be useful in breaking the intergenerational flow of cultural information on belief-based use of vultures in children by exposing them to a new narrative that embodies respect for vultures and the refusal to buy or kill them for traditional medicine. This new cultural trait would stick with these children and follow them into adulthood as has been demonstrated in their predecessors who heard contrary stories about vultures from childhood and grew with these beliefs without changing them.

Such stories and the forum for discussions would conventionally fit the radio for a means of two-way communication, since the days are gone when people sat under the moonlight to hear stories, especially in urban areas where vultures are sold and bought (Lawrence and Paige 2016). The radio is the most used platform in Nigeria with more than 70% across all major demographic groups stating they use the radio for news (BBG 2014). This makes the radio the most suitable media for conveying cultural information that will reach a wide and varied audience, as demonstrated in the IUCN funded project of Ranomafana National Park (Fernandez-Llamazares and Cabeza 2018). It is important to note that the facilitators who will anchor these stories on radio would need to be trained and selected based on leadership proficiency, communication skills, ethnic membership and prestige, interest in the stories themselves and concern for vultures (Hodge *et al.* 2002).

Finally, audience segmentation would be useful for an effective communication outreach. For instance, in terms of age, the storytelling projects would need to be bespoke for particular groups, i.e., adults and children among buyers of vulture parts, since both age groups will relate to these stories in different ways. Audience segmentation in terms of age would therefore be of advantage for effective pro-vulture messaging through stories. Literacy levels would not provide any advantage for audience segmentation since degree holders along with traders with low levels of education were found selling and buying vultures during the study. However, gender might be important for audience segmentation since it seems mostly males are the buyers of vulture parts. Further audience research is needed to confirm this, given the buyers encountered in this study are too few to establish any meaningful pattern.

## V.4. Regulatory framework for controlling illegal trade in vultures, agency action and funding in Nigeria

This section presents and critically discusses data related to the regulatory framework (The National Wildlife Species Protection Act 2015) to control illegal trade in vultures and responses of government staff about agency action and funding. Even with the behavioral intervention proposals in the preceding sections, a regulatory framework by government backed up by effective enforcement and adequate funding is still necessary to give a statutory background that would engender respect and observance of the law by society.

Vultures have been protected by law in Nigeria since the 1980s, under *The Endangered Species (Control of International Trade and Traffic) Decree No. 11 of 1985* (Sodeinde and Soewu 1999). According to this decree, the hunting, capture or trade in animal species threatened with extinction and listed under Schedule 1, was prohibited (Sodeinde and Soewu 1999). Less threatened species under Schedule 2 were permitted only under license (Sodeinde and Soewu 1999). In 2016, the

decree was changed into an Act and vultures remain listed under *Schedule 1* of the *National Wildlife Species Protection Act*.

In the field, I observed the impact of this Act on some wildlife traders. For example, excerpts from my field notes reveal the following:

*I arrive to the fourth trader's shop, and they tell me that they have been instructed by the Federal Government not to sell vultures again, that it is against the law. The head of the entire traders in the market was invited for a radio program where the importance of vultures was discussed and where she was told to tell other traders not to sell vulture parts again.*

It can be inferred from the above statement that there is indeed a government campaign against the sale of vultures in southwestern Nigeria. The fact that the trader made note of government intervention indicates that the message is getting across, there is awareness, and the effect of regulation could be seen if these interventions are sustained for the long-term, based on behavioral science tools ('t Sas-Rolfes *et al.* 2019). These efforts could have a greater chance if government works to encourage voluntary compliance rather than coercion in the uptake of vulture protection laws. Conservation scientists have emphasized the need not to focus exclusively on law enforcement but to integrate efforts with community-based interventions (Cooney *et al*. 2017; Roe and Booker 2019). This way the control of illegal trade in vultures will not be a 'top-down' approach but involve a buy-in by communities who would work with government to ensure pro-conservation behavior in the region. For instance, studies have shown that traditional enforcement alone may be inadequate for effective conservation (Stern 2008). In understanding why some potential offenders do not violate conservation laws, while others do, perceptions of the trustworthiness of protected area (PA) managers, for instance, were the most consistent predictors of cooperation not to violate conservation laws by those living near protected areas (Stern 2008).

These trust assessments were mostly due to respondents' perceptions of good personal communications between PA managers and the public, of PA managers' acknowledgement and acceptance of local contribution, of the advantages and disadvantages in relation to PA presence, and of PA officials' worthwhile execution in their roles and the practice of equity in treating various groups (Stern 2008).

To bridge the gap between theory and practice, the regulatory framework to control illegal trade in vultures from the perspective of government inclusive of agency action and funding were determined through interviews conducted with FMEnv staff in Abuja, the Federal Capital Territory of Nigeria. During the first interview with an FMEnv member of staff, the participant stated his knowledge about relevant legislation and noted vultures have well been protected by law in Nigeria. He explained how the laws protecting vultures in Nigeria are enforced:

*"The National Environmental Standards and Regulations Enforcement Agency is the CITES enforcement authority in Nigeria. So, wherever they see issues of hunting, reports are made, they investigate and later write to the management authority and then they can make arrest themselves."* (Respondent 1, FMenv, Abuja, Nigeria)

Awareness outreach programs were suggested to increase success of legislation enforcement and the need to close funding gaps was mentioned.

When asked when the deployment of enforcement officers was initiated and if it still ongoing in southwestern Nigeria (given that open wildlife markets were still in operation in the study area), a second FMEnv staff stated the deployment of enforcement officers is ongoing and has been there for a long time since Decree no. 11 was established and changed to Act in 2016 and signed into law. Concerning external donor support, the participant mentioned the following institutions: Born

Free, USAID-WABICC, the German Government (which is helping Nigeria develop a national strategy to tackle IWT), and Wildlife Conservation Society. He also stated that the relationship of FMEnv with the anti-crime units has been cordial and there are regular stakeholders' meetings involving e.g., donors, INTERPOL. However, when asked how many arrests have been made in the last 3 years with respect to the illegal trade of wildlife (especially vultures), and how much in fines have been collected, he could not give me a definite answer. This lack of data could probably be related to inadequate political will by government. Other challenges mentioned in managing the IWT include inadequate training of frontline officers to recognize vulture species, finance, and security. Lack of political will is a major problem facing biodiversity conservation in Nigeria (Olawuyi and Olusegun 2018). Governments over time have failed to provide the needed resources to enable effective implementation of national and international laws covering biodiversity protection in the country (Olawuyi and Olusegun 2018). For instance, because of political corruption and fraud, the FMenv has been continuously constrained in implementing long-term biodiversity programs (Mutum 2015). The Boko-Haram insurgency is a security threat in northern Nigeria (Osumah 2013) where wildlife markets for belief-based use have been identified (Saidu and Buij 2013). Further, insecurity has recently taken new dimensions with bandits executing mass kidnappings in the northwest (Africanews 2021).

These findings clearly depict that the Nigerian government needs a multi-pronged approach to address the challenge of illegal trade in vultures. For instance, when asked how illegal trade in vultures could be stopped, both government officials identified legislative enforcement, awareness campaigns, alternative means of livelihood and research as possible solutions.

These suggested ways forward have a number of implications, including a need to complement legislative enforcement with community engagement, and awareness campaigns need the

incorporation of long-term behavioral science research (‘t Sas-Rolfes *et al.* 2019). The third proposed solution, i.e., alternative livelihoods, is unlikely to be effective for a number of reasons. First, this study revealed that the wildlife trade is a very lucrative business for some who are good at it and may compete with or even surpass other alternative means of livelihood. For example, one trader stated: “*If given a better job than this, I will not do it. I don’t believe there is a more profitable business*” (Trader 2, Abeokuta, Female, 24 years old). Another trader stated: “*This job is more profitable to me. For instance, I can sell a product of worth 20 Naira* [0.048 USD] *for 200 Naira* [0.48 USD]*, making huge profits. If they provide me a better job, I will not do it, because this job is lucrative*” (Trader 7, Abeokuta, Female, 28 years old).

Second, because the wildlife trade is a deeply embedded cultural practice that is passed from generation to generation through families, traders are reluctant to leave the profession. For instance, one trader stated: “*We cannot focus on another business even though it brings more profit than the wildlife trade business. We cannot leave this business because it is inherited. If we do this, our ancestors will not be happy with us. Even though we do another business, we must continue with this business*” (Trader 10, Ibadan, Female, 45 years old). Another stated: “*Yes, I will be interested in a more profiting job. But I won’t be able to leave the wildlife trade because it is a family business*” (Trader 4, Abeokuta, Female, 49 years old).

Third, some traders have been in the practice for so long such that they feel it is not possible to learn something new at this stage in their lives. For example, one trader stated: “*If I must do another business, it would mean I would have to leave this one and begin to learn a new trade. This challenge in learning a new trade after I am already established in this one is why I am not interested”* (Trader 5, Abeokuta, Female, 46 years old). Another stated: “*Because I have been known with this business it is difficult for me to leave it. This business involves special experience*

*which is not common as found in other petty businesses*" (Trader 6, Abeokuta, Female, 28 years old).

Finally, I agree that research as stated by government officials is an important strategy for government to address the IWT. Studies that especially focus on behavioral science research to understand the best behavioral interventions that will work in in the study area to control the buying and selling of vultures and their body parts in the region would be critical in giving the much-needed complement to legislative action. For example, there is evidence that social influence and minor adjustments to how decisions are made can shape pro-environmental decisions (Byerly *et al.* 2018). Another important study would be to understand why the non-killing traditions of vultures among Yoruba people are no longer prevalent and possibly when this happened historically and how. This would inform behavioral change interventions in reestablishing social norms about the non-killing traditions concerning vultures.

This seeming non-alignment of the government officials' suggestions with my own study's findings point to the possibility that government officials are removed from the situation on the ground in the open wildlife markets in southwest Nigeria and elsewhere in the country. This might be because government officials have not carried out, nor have access to, relevant research as a result of lack of funding and poor political will as has been mentioned. For instance, Adeola's (1992) work on "Importance of Wild Animals and Their Parts in the Culture, Religious Festivals, and Traditional Medicine, of Nigeria" was funded by the Federal Ministry of Agriculture and the Federal Ministry of Science and Technology when Nigeria's economy was relatively buoyant compared to today.

Given all these, it is reasonable to discuss what the future holds for vultures in Nigeria and West Africa amidst their use for belief-based purposes.

## V.5. Belief-based use: The future of vulture conservation in Nigeria and West Africa

We have limited time left for critically endangered vulture species in West Africa (Ogada *et al.* 2016), hence, the behavioral change interventions proposed in this chapter are crucial for demand reduction of vulture body parts and resulting minimization of the pressure on vulture populations since demand for vultures extends beyond Nigeria (Saidu and Buij 2013). Outside these proposed interventions in southwest Nigeria, it might be worthwhile to ask on a broader scale: Given vultures are still extant, will cultural beliefs and practices such as illegal trade and belief-based use of vultures and other wildlife persist into the future? If so, for how long?

In answering the above question, we understand that the 21st century is characterized by rapid global change. Scientists are aware of the linkages between cultural, linguistic, and biological diversity and agree that these manifestations of the diversity of life are threatened (AMNH 2008). Culture is not static, and its evolution is a continuous process, and this is even more the case in the digital age where traditional barriers to foreign ideologies and cultures are leveling rapidly (Kashima 2014; Hamedani and Markus 2019; Levin and Mamlok 2021). While cultural beliefs and practices relating to illegal trade and belief-based use of vultures are conservative cultural phenomena (meaning they are slow to change), according to Cultural Transmission Theory, they are liable to change rapidly especially if influenced by the one-to-many (e.g., the mass media or internet, opinion leaders to people) mechanism of cultural transmission (Cavalli-Sforza *et al.* 1982), which has been proposed in this chapter. Therefore, as Africa continues to open to the digital space with increasing pace, in the mid to long-term, communities in Nigeria and West Africa will be exposed to new modes of thinking, especially as the universality of protecting biodiversity pervades West African society and this could inspire new attitudes and behavior. The foregoing is representative of oblique transmission where culture is transmitted from other adults

(outside the immediate family and peers) and institutions (Berry and Georgas 2008). Further, in being perpetuated intergenerationally, this transmission would only be successful if the 'universality of protecting biodiversity' becomes prevalent in West Africa as explained by the conformist transmission ideology. As stated in section II.3.3., conformist transmission refers to the transmission of cultural traits that are the most common in the population which give high frequencies in the next generation (Schönpflug 2008). For example, the potential for oblique transmission can be seen from a recent broadcast by the *Audubon Magazine*. Their report captioned "Growing Demand for Vulture Heads Threatens the Birds' Survival in Africa" brought international attention to the issue of illegal trade and belief-based use of vultures in West Africa. The report caused an outcry by many on social media, representative of social norms foreign to West Africa with potential to infiltrate the subregion (Rubiano A. 2021, pers. obs.). In today's world, biodiversity is a common global heritage, having implications for the way local communities relate with biodiversity which hitherto was localized but now with worldwide ramifications. However, it has been argued that there are flaws in the globalization paradigm where the boundless nature of the internet can be limited by national governments irrespective of what may be thought of such action from the perspective of freedom to communicate (Flew 2018). Further, where users of the internet have access to global content, there is a high probability that they will tend toward local information and entertainment sources, especially where English is not the language of communication (Taneja and Wu 2014). Nonetheless, African researchers have argued that cultural globalization is transforming Africa at a disturbing rate with deep repercussions (Daramola and Oyinade 2015). The effects of globalization may not be evenly appreciated, yet conservation stands to gain if cultural beliefs and practices that impact vultures and other threatened wildlife negatively are minimized. However, successful behavioral change

intervention programs, such as those proposed in this chapter, would still be important to buy us time for threatened vulture species in West Africa to possibly recover.

## V.6. Summary

This chapter sought to provide proposals to mitigate the problem of the vulture trade based on theoretical foundations of culture transmission theory. First, I argued with support from the scientific literature that Muslim leaders could be effective ambassadors of pro-vulture behaviors among vulture traders and then developed a proposal on how to achieve this. Second, the opportunities inherent in storytelling to foster new familial values that are pro-vulture among buyers of vultures were explored. Finally, I investigated the role of government in curbing the illegal trade in vultures, the challenges on their path to achieving this objective and gave suggestions on strengthening government proposals to halt the illegal trade. I then conclude by discussing the broader context of my study, building on discussions in chapters IV and this chapter and looking at the future of illegal trade in vultures and belief-based use in West Africa.

# Chapter VI. Conclusion

## VI.1. Introduction

In this chapter, I summarize my key findings. I also discuss the theoretical and practical contributions of the dissertation to the field of conservation social science and policy.

## VI.2. Summary of key findings

The overall aim of this dissertation was to understand how socio-cultural influences have shaped and might change the behavioral patterns of traders and buyers of vulture parts for belief-based use as stated in Chapter I.

Essentially, I argued that even when it has been suggested that the illegal vulture trade is contributing to vulture declines (Buij *et al*. 2016), very little research has been done on the social dimensions of the vulture trade. Moreover, sociological theories were yet to be applied to studying traders and buyers of vulture parts for belief-based use given the importance of theory to understand what socio-cultural factors are influencing the behaviors of traders and buyers of vulture parts and to resolve the behavioral problems of trading and buying vulture parts for belief-based use. Prescriptions for solving these cultural behavioral problems can best be derived from a theory such as the Cultural Transmission Theory which is well suited for culturally embedded problems that involve transfer of cultural traits.

The dissertation investigated these cultural problems on two levels: by 1) seeking to know what, and how, socio-cultural factors influence the behavioral patterns of traders and buyers of vulture parts for belief-based use and 2) how to minimize the trade in vulture parts.

With regards to the above investigations, the following conclusions have been drawn:

1. Whether traders or buyers of vulture parts, cultural transmission (vertical and horizontal transmission) is the mode of transmission of cultural traits, and therefore the avenue through which behaviors concerning trading or buying vultures for belief-based use are influenced.

2. The Cultural Transmission Theory can offer prescriptions to minimizing the trade in vulture parts and two propositions have been made in this dissertation based on this: i) the engagement of religious opinion leaders to bring about cultural change among illegal traders of vulture parts and ii) the role of storytelling in giving rise to new familial values among buyers of vulture parts.

3. An emergent theme from the research, social support (see chapter IV), represents the support received from members of the trade association *Elewe-Omo* and sustains the illegal trade in vultures.

In addressing the question of how to minimize the vulture trade, I interviewed government officials and found out that their suggestions to minimize the vulture trade were seemingly in non-alignment with my findings. This may be because these officials were out of touch with the situation at the wildlife markets, which could be attributed to the fact that government capacity, political will and finance for research has fallen over the years.

I discussed on a broader scale beyond southwest Nigeria, the fluidity of culture and its evolution, given for example, the forces of globalization, which could be beneficial to conservationists as harmful cultural practices and beliefs that impact vultures are possibly prone to be minimized in the future. That is if vultures survive long enough beyond the time scale of the erosion of these harmful cultural traits, which is why intervention programs could buy us time towards saving threatened vulture species so that they can possibly recover.

This study fills an important gap in the literature where, for example, no research has previously made an in-depth analysis of the cultural transmission (vertical and horizontal transmission) dimensions of the trading and buying of vultures for belief-based use. Although Saidu and Buij (2013) mention briefly that most respondents in northern Nigeria inherited the trade for belief-based use from their parents (vertical transmission) and some from unrelated persons (horizontal transmission), my dissertation extended this observation by demonstrating that cultural transmission and social support are determinant in shaping the behavioral patterns for trade of vulture parts for belief-based use. Further, this research, for the first time, studied buyers of vulture parts and discovered cultural transmission is also instrumental in shaping the behaviors of these buyers and the possibility that mostly men do the buying of vultures which could be important information for possible targeted intervention programs. Another significant finding is the role of syncretism among Yoruba Muslim vulture traders which supports beliefs that influence the behavior to sell or use vultures. This discovery can enable policy makers and conservation managers to be more culturally sensitive when engaging traders or buyers of vulture parts in behavioral change intervention programs (see chapter V. 2.). Finally, one of the primordial myths about the vulture concerning its redemptive role for Earth, in the beginning, among the Yoruba was documented for the first time in the field of conservation social science, contributing to new understanding about the culturally embedded nature of this important avian taxa.

Overall, the findings of this study are important because they extend knowledge and understanding of the research problem by showing how Cultural Transmission Theory can in part explain the illegal trade and belief-based use of vultures and how to solve these problems. The use of Cultural Transmission Theory gives clarity on understanding the intricacies of the research problem, such as the modes of transmission of associated cultural traits (the vulture trade practice and belief-

based use) and the way these behaviors are acquired. These give utility to developing ideas on behavioral change interventions which are important for demand reduction of vultures and their body parts.

The outcome of this research recommends that vultures in Nigeria and West Africa could stand a chance if conservationists work to contribute to reducing the pressure on already fragile populations of critically endangered vulture species in the sub-region. Ideally, this would start in Nigeria, but extend outwards since the trade in the country impacts vultures in other West African countries such as Chad, Niger, Benin etc. (Saidu and Buij 2013). Minimizing pressure on vulture populations due to killing for belief-based use could be achieved by demand reduction in southwestern Nigeria through the proposals given in this dissertation, complemented by law enforcement.

## VI.3. Theoretical contribution

According to Makadok *et al.* (2018:1531), "Theory is necessarily an abstraction and simplification of reality. As such, it represents an attempt to accurately capture some salient aspects of some phenomenon for some particular question or purpose, while still being parsimonious." However, a theory may be used more broadly in application to phenomena or contexts than where the theory was initially developed (Makadok *et al.* 2018). Further, any theory may be applicable to different situations, with implications for diverse phenomena (Makadok *et al.* 2018). Thus, the Cultural Transmission Theory which provided the framework for this study was applied for the first time to explain the illegal trade in vultures and IWT in general among Yoruba in southwest Nigeria. The theoretical contribution is seen in the utility of the Cultural Transmission Theory to explain new phenomena (relative to the theory's application) such as the illegal vulture trade practice and belief-based use of vultures.

Although the theorizing process mainly makes provisions for one major input – a research question - there is room for diverse kinds of outputs, which include explanations, predictions, and prescriptions (Brodbeck 1968). Therefore, another theoretical contribution of this study are the prescriptions or propositions given based on the Cultural Transmission Theory, i.e., the engagement of religious opinion leaders to bring about cultural change among illegal traders of vulture parts and the role of stories in giving rise to new familial values among buyers of vultures (see chapter V). However, one potential weakness of the Cultural Transmission Theory is that it is mainly descriptive, i.e., telling us *what*, but it does not tell us *how* to achieve its prescriptions. For example, one mechanism of transmission of this theory is one-to-many which has been prescriptively described as the most rapid form of culture change. However, the Cultural Transmission Theory does not show how to achieve this mechanism of transmission. One way of mitigating such weakness is to combine the theory with other theories that have this utility, such as Social Marketing Theory.

## VI.4. Practical contribution and avenues for further research

This dissertation research makes a significant practical contribution by meeting policy needs, especially in contributing to developing proposals to effecting objective 4 of the CMS Vulture MsAP "To reduce and eventually to halt the trade in vulture parts for belief-based use" (Botha *et al.* 2017:9) as shown in chapter V. The study also provides a basis for replicating studies in other areas of Nigeria and Africa where similar practices related to illegal trade and belief-based use of vultures occur. For example, similar studies could be carried out in northern Nigeria where it has been reported that the Hausa also engage in the illegal trade and belief-based use of vultures (Saidu and Buij 2013). Further, the implication of the results of this research is where the Cultural Transmission Theory makes provisions for innovation of cultural behavior (towards pro-

conservation) concerning the trading and buying of vulture parts. Therefore, the outcome of this study has wider implications in the fields of conservation biology and social science. For instance, the Cultural Transmission Theory could be similarly used to explain and prescribe changes to the behavior of bushmeat consumption among communities in West and Central Africa, as bushmeat consumption has been reported to be culturally driven (Schenck *et al.* 2006; Chausson *et al.* 2019). Bushmeat consumption mirrors the belief-based use of vultures in several ways. First, for both phenomena, cultural factors are one of the drivers of behavior behind these practices. Second, in both cases, parents pass associated cultural traits, i.e., eating bushmeat and belief-based use of vultures to their children (see chapter IV; Chausson *et al.* 2019). Third, both practices are prevalent in cities in West and Central Africa (see chapter IV; Saidu and Buij 2013; Awoyemi 2014; Chausson *et al.* 2019). Questions that would arise from investigating bushmeat consumption based on the Cultural Transmission Theory could be: 1) What is the process of acquisition of behaviors of consuming bushmeat among local people? Is it through imitation, imprinting? 2) What are the mechanisms of transmission of the cultural trait or behavior to consume bushmeat? Is it vertical (parents or family members to children) or horizontal (through unrelated persons)?

# Bibliography


Abolade, L. 2020. *REPORT: Constant relaxation of lockdown puts Ogun residents at high risk of contracting Coronavirus.* ICIR website [online] https://www.icirnigeria.org/report-constant-relaxation-of-lockdown-puts-ogun-residents-at-high-risk-of-contracting-coronavirus/ Accessed 4 June, 2021.

Adebayo, A. 2010. *The nature and functions of literature: The comparatist's perspective*. An Inaugural Lecture of the University of Ibadan, Ibadan.

Adeduntan, A. 2019. *What the forest told me: Yoruba hunter, culture, and narrative performance*. NISC (Pty) Ltd. NISC website [online] https://www.nisc.co.za/media/docs/155559593018.pdf Accessed 23 January, 2021.

Adeola, M.O. 1992. Importance of wild animals and their parts in the culture, religious festivals, and traditional medicine, of Nigeria. *Environmental Conservation* 19(2): 125-134.

Adewoye, S. 2007. *Legal Framework for Animals and Game Management in Nigeria*. Ibadan: Positive Press.

Adu, P. 2017. *Using sorting strategy in qualitative analysis*. You Tube website [online] https://www.youtube.com/watch?v=UAXP_gyN160 Accessed 15 January, 2021.

Africannews. 2021. *Nigeria's Buhari faces backlash over worsening insecurity under his watch.* Africannews website [online] https://www.africanews.com/2021/04/30/nigeria-s-buhari-faces-backlash-over-worsening-insecurity-under-his-watch// Accessed 4 June, 2021.

Agu, H.U. and Gore, M.L. 2020. Women in wildlife trafficking in Africa: A synthesis of literature. *Global Ecology and Conservation* 23: e01166.

Agunbiade, M.O., Opatola, M. and Titilayo, A. 2012. Herb Sellers' Knowledge on Climate Change and Attitudes toward Sustainable Herbal Harvesting in Nigeria. *Journal of Applied Social Science* 6:165-175.

Agwu, O. 2021. *Maternal Health: USAID inaugurates advocacy committee in Ebonyi*. The Eagleonline website [online] https://theeagleonline.com.ng/maternal-health-usaid-inaugurates-advocacy-committee-in-ebonyi/ Accessed 9 February, 2021.

Ajadi, B.S. and Tunde, A.M. 2010. Spatial variation in solid waste composition and management in Ilorin Metropolis, Nigeria. *Journal of Human Ecology* 32: 101-108.

Ajzen, I. 1991. The theory of planned behavior. *Organizational Behavior and Human Decision Processes* 50(2): 179-211.

_____. 2002. Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology* 32(4):665–683.

_____.2013. *Theory of Planned Behavior Questionnaire. Measurement Instrument Database for the Social Science*. The midss website [online] www.midss.ie Accessed 11 November, 2021.

_____. 2015. The theory of planned behavior is alive and well, and not ready to retire: a commentary on Sniehotta, Presseau, and Araújo-Soares. *Health Psychology Review* 9(2):131–137.

_____. 2019. *Behavioral interventions based on the theory of planned behavior*. The University of Massachusetts website [online] https://people.umass.edu/aizen/pdf/tpb.intervention.pdf Accessed 4 June, 2021.

Alegba, S. 2019. *NCF boosts campaign to save vultures from extinction*. NNN News website [online] https://nnn.ng/ncf-boosts-campaign-to-save-vultures-from-extinction/ Accessed 15 January, 2021.

Alonso-Castro, Á.J. 2014. Use of medicinal fauna in Mexican traditional medicine. *Journal of Ethnopharmacology*, 152(1): 53-70.

Alves, R.R.N. and Alves, H.N. 2011. The faunal drugstore: Animal-based remedies used in traditional medicines in Latin America. *Journal of Ethnobiology and Ethnomedicine* 7(1): 1-43.

_____., Souto, W.M. and Barboza, R.R. 2010b. Primates in traditional folk medicine: a world overview. *Mammal Review* 40(2): 155-180.

_____., Barboza, R.R.D. and Souto, W.M.S. 2010a. A Global overview of canids used in traditional medicines. *Biodiversity and Conservation*, 19(6): 1513-1522.

_____, Borges, A.K.M., Barboza, R.R.D., Souto, W.M.S., Gonçalves-Souza, T., Provete, D.B. and Albuquerque, U.P. 2020. A global analysis of ecological and evolutionary drivers of the use of wild mammals in traditional medicine. *Mammal Review* 1-14.

_____., Lima, J.R.D.F. and Araujo, H.F.P. 2013. The live bird trade in Brazil and its conservation implications: an overview. *Bird Conservation International* 23(1): 53-65.

American Museum of Natural History (AMNH). 2008. *2008 Sustaining Cultural and Biological Diversity in a Rapidly Changing World: Lessons for Global Policy.* American Museum of Natural History website [online] https://www.amnh.org/research/center-for-biodiversity-conservation/convening-and-connecting/2008-biocultural-diversity Accessed 27 April, 2021.

Andreasen, A.R. 1994. Social marketing: Its definition and domain. *Journal of public policy & marketing* 13(1):108-114.

Andreasen, A.R. 2002. Marketing social marketing in the social change marketplace. *Journal of Public Policy & Marketing* 21(1): 3-13.

Andriamalala, G., Peabody, S., Gardner, C.J. and Westerman, K. 2013. Using social marketing to foster sustainable behaviour in traditional fishing communities of southwest Madagascar. *Conservation Evidence* 10: 37-41.

Angelov, I., Hashim, I. and Oppel, S. 2013. Persistent electrocution mortality of Egyptian Vultures Neophron percnopterus over 28 years in East Africa. *Bird Conservation International* 23(1): 1-6.

Anthony, B.P. and Bellinger, E.G. 2007. Use and value of landscapes, flora and fauna by Tsonga communities in the rural areas of Limpopo Province, South Africa. *South African Journal of Science* 103(3-4):148-154.

_____., Abonyi, S., Terblanche, P. and Watt, A. 2011. Towards bridging worldviews in biodiversity conservation: exploring the Tsonga concept of Ntumbuloko in South Africa. *Research in Biodiversity-Models and Applications*. IntechOpen, DOI: 10.5772/30792.

Araujo-Soares, V., Rodrigues, A., Presseau, J., Sniehotta, F.F. 2013. Adolescent sunscreen use in springtime: a prospective predictive study informed by a belief elicitation investigation. *Journal of Behavioral Medicine* 36(2):109–123. https://doi.org/10.1007/s10865-012-9415-3.

Assou, D., Elwin, A., Norrey, J., Coulthard, E., Megson, D., Ronfot, D., Auliya, M., Segniagbeto, G.H., Martin, R.O. and D'Cruze, N. 2021. Trade in African Grey Parrots for Belief-Based Use: Insights from West Africa's Largest Traditional Medicine Market. *Frontiers in Ecology and Evolution* 9: 1-10.

Atkinson, P. and Hammersley, M. 1998. Ethnography and participant observation. *Strategies of Qualitative Inquiry. Thousand Oaks: Sage*. pp.248-261.

Awolalu, J.O. 1976. What is African traditional religion. *Studies in Comparative Religion* 10(2):1-10.

Awoyemi, S. 2008. The Role of Religion in the HIV/AIDS Intervention in Africa: A Possible Model for Conservation Biology. *Conservation Biology* 22: 811-813.

_____. 2014. *Vulture declines in West Africa: investigating the scale and (socioeconomic) drivers of the trade in vulture parts for traditional medicine*. MPhil thesis. University of Cambridge, UK.

_____., Gambrill, A., Ormsby, A. and Vyas, D. 2012. Global Efforts to Bridge Religion and Conservation: Are They Really Working? In *Topics in Conservation Biology*, ed. T. Povilitis, 97-110. Croatia: In Tech, ISBN 978-953-51-0540-4.

Bachmann, M.E., Junker, J., Mundry, R., Nielsen, M.R., Haase, D., Cohen, H., Kouassi, J.A. and Kühl, H.S. 2019. Disentangling economic, cultural, and nutritional motives to identify entry points for regulating a wildlife commodity chain. *Biological Conservation* 238: 108177.

Bale, R. 2015. *Pope Francis Pushes for Crackdown on Ivory Trafficking*. National Geographic website [online] https://www.nationalgeographic.com/news/2015/11/151127-pope-francis-Kenya-ivory-trafficking-poaching/ Accessed 17 February, 2021.

_____. and Fobar, R. 2020. *Pangolin scale seizures at all-time high in 2019, showing illegal trade still booming*. National Geographic Society website [online] https://www.nationalgeographic.com/animals/article/pangolin-scale-seizures-all-time-high-2019 Accessed 27 March, 2021.

Balogun, A.M. 2011. *Syncretic Beliefs and Practices amongst Muslims in Lagos State Nigeria; With Special Reference to the Yoruba Speaking People of Epe*. DPhil Thesis. University of Birmingham, UK.

Barron, D.H. 2015. How the illegal wildlife trade is fueling armed conflict. *Georgetown Journal of International Affairs* 16: 217-227.

Beedell, J. and Rehman, T. 2000. Using social-psychology models to understand farmers' conservation behaviour. *Journal of Rural Studies* 16(1): 117-127.

Beilis, N. and Esterhuizen, J. 2005. The potential impact on Cape Griffon *Gyps coprotheres* populations due to the trade in traditional medicine in Maseru, Lesotho. *Vulture News* 53: 15-19.

Bennett, N.J., Roth, R., Klain, S.C., Chan, K., Christie, P., Clark, D.A., Cullman, G., Curran, D., Durbin, T.J., Epstein, G. and Greenberg, A. 2017a. Conservation social science: Understanding and integrating human dimensions to improve conservation. *Biological Conservation* 205:93-108.

_____., Roth, R., Klain, S.C., Chan, K.M., Clark, D.A., Cullman, G., Epstein, G., Nelson, M.P., Stedman, R., Teel, T.L. and Thomas, R.E. 2017b. Mainstreaming the social sciences in conservation. *Conservation Biology* 31(1):56-66.

Berglund, A.I. 1976. *Zulu thought patterns and symbolism*. Uppsala: Almquist and Wiksell.

Berry, J.W. and Georgas, J. 2008. An ecocultural perspective on cultural transmission: the family across cultures. In *Cultural transmission: psychological, developmental, social, and methodological aspects*, ed. U. Schönpflug, 95-125. UK: Cambridge University Press.

BirdLife International. 2016. Motivation note to the African Union for vulture conservation. BirdLife International. Cambridge, UK.

_____. 2019. *Critical decisions made for vultures, songbirds & other birds threatened by illegal trade.* BirdLife International website [online] https://www.birdlife.org/worldwide/news/critical-decisions-made-vultures-songbirds-other-birds-threatened-illegal-trade Accessed 27 April, 2021.

_____. 2020. *Working with traditional healers to end vulture poaching.* BirdLife International website [online] https://www.birdlife.org/africa/news/working-traditional-healers-end-vulture-poaching Accessed 11 April, 2021.

_____. 2021b. *Saving Africa's vultures*. BirdLife International website [online] https://www.birdlife.org/african-vultures Accessed 11 April. 2021.

_____. 2021a. *Tackling illegal killing, taking and trade of birds in Sub-Saharan Africa*. BirdLife International website [online] https://www.birdlife.org/africa/news/tackling-illegal-killing-taking-trade-birds-sub-saharan-africa Accessed 27 March, 2021.

Bisin, A. and Verdier, T. 2008. Cultural transmission. *The New Palgrave Dictionary of Economics*. DOI 10.1057/978-1-349-95121-5_2798-1.

Boakye, M.K., Pietersen, D.W., Kotzé, A. Dalton, D.L. and Jansen, R., 2014. Ethnomedicinal use of African pangolins by traditional medical practitioners in Sierra Leone. *Journal of Ethnobiology and Ethnomedicine* 10(1): 1-10.

Bomgardner, D. L. 2000. *The story of the roman amphitheatre*. London: Routledge.

Borokini, T.I. and Lawal, I.O. 2014. Traditional medicine practices among the Yoruba people of Nigeria: A historical perspective. *Journal of Medicinal Plants Studies* 2(6):20-33.

Boshoff, A.F., Minnie, J.C., Tambling, C.J. and Michael, M.D. 2011. The impact of power line-related mortality on the Cape Vulture *Gyps coprotheres* in a part of its range, with an emphasis on electrocution. *Bird Conservation International* 21(3): 311-327.

Botha, A. J., Andevski, J., Bowden, C. G. R., Gudka, M., Safford, R. J., Tavares, J. and Williams, N. P. 2017. *Multi-species Action Plan to Conserve African-Eurasian Vultures*. CMS Raptors MOU Technical Publication No. 5. CMS Technical Series No. xx. Coordinating Unit of the CMS Raptors MOU, Abu Dhabi, United Arab Emirates.

Bowden, C.G. 2017. The creation of the SAVE consortium–Saving Asia's Vultures from Extinction: a possible model for Africa? *Ostrich* 88(2): 189-193.

Boyd, R. and Richerson, P.J. 1996. Why culture is common, but cultural evolution is rare. In *Proceedings-British Academy* 88: 77-93.

Boyd, R. and Richerson, P. 1985. *Culture and the evolutionary process*. Chicago: University of Chicago Press.

Braun, V. and Clarke, V. 2012. Thematic analysis. In *APA handbook of research methods in Psychology* ed. H. Cooper, 57-71. American Psychological Association.

Broadcasting Board of Governors (BBG). 2014. *Contemporary media use in Nigeria*. BBG website [online] tinyurl.com/333gclnl Accessed 10 February 2021.

_____. 2013. *Television and mobile ubiquitous in Vietnam.* Broadcasting Board of Governors website [online] http://www.bbg.gov/blog/2013/12/11/television-and-mobile-ubiquitous-in-vietnam Accessed 17 April, 2021.

Brodbeck, M. 1968. Explanation, prediction, and 'imperfect' knowledge. In *Readings in the philosophy of the social sciences,* ed. M. Brockbeck, 363–398. New York, NY: Macmillan.

Buechley, E.R. and Şekercioğlu, C.H. 2016. Vultures. *Current Biology* 26(13): 560-561.

Buij, R., Nikolaus, G., Whytock, R., Ingram, D.J. and Ogada, D.L. 2016. Trade of threatened vultures and other raptors for fetish and bushmeat in West and Central Africa. *Oryx* 50(4): 606-616.

But, P.P.H., Lai-Ching, L. and Yan-Kit, T. 1990. Ethnopharmacology of rhinoceros' horn. I: Antipyretic effects of rhinoceros horn and other animal horns. *Journal of Ethnopharmacology* 30: 157-168.

Byerly, H., Balmford, A., Ferraro, P.J., Hammond Wagner, C., Palchak, E., Polasky, S., Ricketts, T.H., Schwartz, A.J. and Fisher, B. 2018. Nudging pro-environmental behavior: evidence and opportunities. *Frontiers in Ecology and the Environment* 16: 159-168.

Cambridge University Press. 2021. *Meaning of syncretism in English*. Cambridge University Press website [online] https://dictionary.cambridge.org/dictionary/english/syncretism Accessed 15 January, 2021.

Campbell, J. 2021. *Yoruba debate: "Restructuring" of Nigeria or "autonomy".* Council on Foreign Relations website [online] https://tinyurl.com/ya6z9awt Accessed 17 April, 2021.

Cavalli-Sforza, L.L. and Feldman, M.W. 1981. *Cultural transmission and evolution: A quantitative approach*. Princeton University Press.

_____., Feldman, M.W., Chen, K.H. and Dornbusch, S.M. 1982. Theory and observation in cultural transmission. *Science* 218(4567): 19-27.

Central European University (CEU). 2018. *CEU Ethical Research Policy*. CEU website [online] https://documents.ceu.edu/documents/p-1012-1v1805 Accessed 17 April, 2021.

Challender, D.W. and MacMillan, D.C. 2014. Poaching is more than an enforcement problem. *Conservation Letters* 7(5):484-494.

Chausson, A.M., Rowcliffe, J.M., Escouflaire, L., Wieland, M. and Wright, J.H. 2019. Understanding the sociocultural drivers of urban bushmeat consumption for behavior change interventions in Pointe Noire, Republic of Congo. *Human Ecology* 47(2): 179-191.

Cheng, H. Kotler, P. and Lee, N. 2011. *Social marketing for public health: global trends and success stories*. Burlington, Massachusetts: Jones & Bartlett Learning.

Chomczynski, P. 2008. Software review: QDA MINER-The Mixed Method Solution for Qualitative Analysis by Provalis Research. *Qualitative Sociology Review* 4(2): 126-129.

Cinner, J. 2018. How behavioral science can help conservation. *Science* 362(6417):889-890.

Clarke, V. and Braun, V. 2017. Thematic analysis. *The Journal of Positive Psychology* 12(3): 297-298.

Cocker, M. 2000. African birds in traditional magico-medicinal use – a preliminary survey. *Bulletin of the African Bird Club* 7: 60-65.

Coleman, J. 1988. Social capital in the creation of human capital. *American Journal of Sociology* 94: S95–S120.

Conner, M., Godin, G., Sheeran, P. and Germain, M. 2013. Some feelings are more important: cognitive attitudes, affective attitudes, anticipated affect, and blood donation. *Health Psychology* 32(3):264–272.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). 2019. West African vulture trade and conservation management. Eighteenth meeting of the Conference of the Parties, Colombo (Sri Lanka), 23 May – 3 June 2019. CITES website [online] https://tinyurl.com/5rtjedzj Accessed 12 July, 2021.

Cooney, R., Roe, D., Dublin, H., Phelps, J., Wilkie, D., Keane, A., Travers, H., Skinner, D., Challender, D.W., Allan, J.R. and Biggs, D. 2017. From poachers to protectors: engaging

local communities in solutions to illegal wildlife trade. *Conservation Letters* 10(3):367-374.

Corner, A. and Randall, A. 2011. Selling climate change? The limitations of social marketing as a strategy for climate change public engagement. *Global Environmental Change* 21(3): 1005-1014.

Coster, A.S. and Otufale, G.A. 2010. Economic analysis of frozen fish marketing in Ijebu ode local government area, Ogun state, Nigeria. *Research Journal of Social Sciences* 1: 96-101.

Cowling, R.M. 2020. *Behaviors for conserving biodiversity*. The Royal Society website [online] tinyurl.com/1ay15hz6 Accessed 10 February, 2021.

Cragg, G.M. and Newman, D.J. 2013. Natural products: a continuing source of novel drug leads. *Biochimica et Biophysica Acta (BBA)-General Subjects* 1830(6): 3670-3695.

Dal Cin, S., Zanna, M.P. and Fong, G.T. 2004. Narrative persuasion and overcoming resistance. In *Resistance and persuasion* eds. E.S. Knowles and J.A. Linn, 175-191. London: Lawrence Erlbaum Associates, Publishers.

Daly, J.W., Spande, T.F. and Garraffo, H.M. 2005. Alkaloids from amphibian skin: a tabulation of over eight-hundred compounds. *Journal of Natural Products* 68(10): 1556-1575.

Dangol, B.R. 2015. *Illegal wildlife trade in Nepal: A case study from Kathmandu Valley*. Masters Thesis. Norwegian University of Life Sciences. Norway.

Daramola, I. and Oyinade, B. 2015. Impact of cultural globalization on African: the role of western media. *International Journal of Education & Research* 3(3): 2201-6740.

Dayer, A.A., Silva-Rodríguez, E.A., Albert, S., Chapman, M., Zukowski, B., Ibarra, J.T., Gifford, G., Echeverri, A., Martínez-Salinas, A. and Sepúlveda-Luque, C. 2020. Applying conservation social science to study the human dimensions of Neotropical bird conservation. *The Condor* 122(3):p.duaa021.

De Groot, W.T. and Zwaal, N. 2007. Storytelling as a medium for balanced dialogue on conservation in Cameroon. *Environmental Conservation* 34:45-54.

Del Hoyo, J., Del Hoyo, J., Elliott, A. and Sargatal, J. 1992. *Handbook of the birds of the world* (Vol. 1, No. 8). Barcelona: Lynx edicions.

DeWan, A., Green, K., Li, X. and Hayden, D. 2013. Using social marketing tools to increase fuel-efficient stove adoption for conservation of the golden snub-nosed monkey, Gansu Province, China. *Conservation Evidence* 10(1): 32-36.

Dickman, A., Johnson, P.J., Van Kesteren, F., and Macdonald, D.W., 2015. The moral basis for conservation: how is it affected by culture? *Frontiers in Ecology and the Environment* 13:325-331.

Doughty, H., Oliver, K., Veríssimo, D., Lee, J.S.H. and Milner-Gulland, E.J. 2021. Using theory and evidence to design behaviour change interventions for reducing unsustainable wildlife consumption. *People and Nature* 3:469–483.

Duffy, R., St John, F.A., Büscher, B. and Brockington, D.A.N. 2015. The militarization of anti-poaching: undermining long-term goals? *Environmental Conservation* 42(4): 345-348.

Eliason, S.L. 1999. The illegal taking of wildlife: Toward a theoretical understanding of poaching. *Human Dimensions of Wildlife* 4: 27-39.

_____. 2012. Trophy poaching: A routine activities perspective. *Deviant Behavior* 33: 72-87.

Emerald Publishing Limited. 2019. *Introduction to ethnographic methods*. Emerald Publishing Limited website [online] https://www.emeraldgrouppublishing.com/research/guides/methods/ethnographic.htm Accessed 17 April, 2021.

Eyssartier, C., Ladio, A.H. and Lozada, M. 2008. Cultural transmission of traditional knowledge in two populations of north-western Patagonia. *Journal of Ethnobiology and Ethnomedicine* 4(1):25.

Ezekwesili-Ofili, J. O. and Okaka, A. N. C. 2019. Herbal Medicines in African Traditional Medicine. In *Herbal medicine*, ed. P. F. Builders, 191-214. Intech Open, DOI: 10.5772/intechopen.80348. Intech Open website [online] https://www.intechopen.com/books/herbal-medicine/herbal-medicines-in-african-traditional-medicine Accessed 5 July, 2021.

Fernández-Llamazares, Á. and Cabeza, M. 2018. Rediscovering the potential of indigenous storytelling for conservation practice. *Conservation Letters* 11:1-12.

Filani M.O. 1994. *Ibadan Region*. Re-Charles Publications in Conjunction with Connell Publications, Ibadan, Nigeria.

Fishbein, M. and Ajzen, 1. 1975. *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.

Flew, T. 2018. Post-globalisation. *Javnost-The Public* 25(1-2): 102-109.

Flick, U. 2014. Mapping the field. In *The SAGE handbook of qualitative data analysis*, ed. U. Flick, 3-18. Dorchester, UK: Henry Ling Limited at Dorset Press.

Foster, K. P. 1998. Gardens of Eden: Exotic flora and fauna in the ancient Near East. In *Transformation of middle eastern natural environments: Legacies and lessons*, eds. J. Coppock and J. A. Miller, 320–329. New Haven: Yale School of Forestry and Environmental Studies.

Froggatt, K.A. 2001. The analysis of qualitative data: processes and pitfalls. *Palliative Medicine* 15(5): 433-438.

Gallardo-Arias, P. 2004. Los especialistas de la curacion.Curanderos teenek y nahuas de Aquismon. *Anales de Antropologia* 38: 179–200.

Gangoso, L. and Palacios, C.J., 2002. Endangered Egyptian Vulture (*Neophron percnopterus*) entangled in a power line ground-wire stabilizer. *Journal of Raptor Research* 36(3): 238-239.

Garfield, Z.H., Garfield, M.J. and Hewlett, B.S. 2016. A cross-cultural analysis of hunter-gatherer social learning. In *Social learning and innovation in contemporary hunter-gatherers*, eds. H. Terashima and B.S. Hewlett, 19-34. Tokyo: Springer.

Gbogbo, F. and Daniels, J.K. 2019. Trade in wildlife for traditional medicine in Ghana: therapeutic values, zoonoses considerations, and implications for biodiversity conservation. *Human Dimensions of Wildlife* 24(3): 296-300.

GetRevising. 2016. *Advantages and disadvantages of non-participant observation*. GetRevising website [online] https://getrevising.co.uk/grids/advantages-and-disadvantages-of-non-participant-2 Accessed 17 April, 2021.

Gore, M.L., Hübshle, A., Botha, A.J., Coverdale, B.M., Garbett, R., Harrell, R.M., Krueger, S., Mullinax, J.M., Olson, L.J., Ottinger, M.A., and Robinson, H.S. 2020. A conservation criminology-based desk assessment of vulture poisoning in the Great Limpopo Transfrontier Conservation Area. *Global Ecology and Conservation* 01076. https://doi.org/10.1016/j.gecco.2020.e01076

Grayson, S.M. 2000. *Symbolizing the Past: Reading Sankofa, Daughters of the Dust, & Eve's Bayou as Histories.* Lanham, Maryland: University Press of America.

Greenfield, S. and Veríssimo, D. 2019. To what extent is social marketing used in demand reduction campaigns for illegal wildlife products? Insights from elephant ivory and rhino horn. *Social Marketing Quarterly* 25(1): 40-54.

Grilli, M.G., Bildstein, K.L. and Lambertucci, S.A. 2019. Nature's clean-up crew: Quantifying ecosystem services offered by a migratory avian scavenger on a continental scale. *Ecosystem Services* 39: 100990.

Guglielmino C.R., Viganotti C., Hewlett B. and Cavalli-Sforza, L.L. 1995. Cultural variation in Africa: Role of mechanisms of transmission and adaptation. *Proceedings of the National Academy of Sciences of the United States of America* 92:7585-7589.

Guynup, S., Shepherd, C.R. and Shepherd, L. 2020. The True Costs of Wildlife Trafficking. *Georgetown Journal of International Affairs* 21:28-37.

Hamedani, M.Y.G., and Markus, H.R. 2019. Understanding Culture Clashes and Catalyzing Change: A Culture Cycle Approach. *Frontiers in Psychology* 10:700. doi: 10.3389/fpsyg.2019.00700.

Heaney, C.A. and Israel, B.A. 2008. Social networks and social support. In *Health behavior and health education*, eds. K. Glanz, B.K. Rimer and K.Viswanath, 189-210. San Francisco, California: Jossey-Bass.

Henrich, J. and Boyd, R. 1998. The evolution of conformist transmission and the emergence of between-group differences. *Evolution and human behavior* 19(4): 215-241.

Henriques, M., Buij, R., Monteiro, H., Sá, J., Wambar, F., Tavares, J.P., Botha, A., Citegetse, G., Lecoq, M., Catry, P. and Ogada, D. 2020. Deliberate poisoning of Africa's vultures. *Science* 370(6514): 304.

Hmielowski, J.D., Kim, C. and Kim, S. 2015. Engaging the Congregation: Examining the Conditional Indirect Effects of Religious Leaders' Cues on Environmental Behaviors. *Journal of Communication and Religion* 38:51-66.

Hoage, R. J. and Deiss, W. A. eds. 1996. *New worlds, new animals: From menagerie to zoological park in the nineteenth century*. Baltimore: Johns Hopkins University Press.

Hodge, F.S., Pasqua, A., Marquez, C.A. and Geishirt-Cantrell, B. 2002. Utilizing traditional storytelling to promote wellness in American Indian communities. *Journal of Transcultural Nursing* 13:6-11.

Houston, T.K., Allison, J.J., Sussman, M., Horn, W., Holt, C.L., Trobaugh, J., Salas, M., Pisu, M., Cuffee, Y.L., Larkin, D. and Person, S.D. 2011. Culturally appropriate storytelling to improve blood pressure: a randomized trial. *Annals of Internal Medicine* 154:77-84.

Hrubes, D., Ajzen, I. and Daigle, J. 2001. Predicting hunting intentions and behavior: An application of the theory of planned behavior. *Leisure Sciences* 23:165-178.

Huang, Q., Wang, F., Yang, H., Valitutto, M. and Songer, M. 2021. Will the COVID-19 outbreak be a turning point for China's wildlife protection: New developments and challenges of wildlife conservation in China. *Biological Conservation* 254: 108937.

Hughes, J. D. 2003. Europe as consumer of exotic biodiversity: Greek and Roman times. *Landscape Research* 28: 21–31.

Hunt, M. and Wilson, G.B. 1975. Attitude change and consistency theories. In *Communications and behavior* eds. C.W. Hanneman and J.W. McEwan, Reading, MA:Addison-Wesley.

IUCN (International Union for the Conservation of Nature). 2016. *Poaching behind worst African elephant losses in 25 years – IUCN report.* IUCN website [online] https://www.iucn.org/news/species/201609/poaching-behind-worst-african-elephant-losses-25-years-%E2%80%93-iucn-report Accessed 4 June, 2021.

Jegede, A.S. 2002. The Yoruba cultural construction of health and illness. *Nordic Journal of African Studies* 11(3):14-14.

Kader, A.B.A.B., Sabbagh, A.L.T.E.S.A., Glenid, M.A.S.A. and Izzidien, M.Y.S. 1983. *Basic paper on the Islamic principles for the conservation of the natural environment.* Gland, Switzerland: IUCN.

Kashima, Y. 2014. How can you capture cultural dynamics? *Frontiers in Psychology* 5:995. https://doi.org/10.3389/fpsyg.2014.00995

Kennedy, A.L. 2010. Using community-based social marketing techniques to enhance environmental regulation. *Sustainability* 2(4): 1138-1160.

Kirwan, L.P. 1963. Land of Abu Simbel. *The Geographical Journal* 129(3): 261-273.

Ko, H.C., Wang, L.L. and Xu, Y.T. 2013. Understanding the different types of social support offered by audience to A-list diary-like and informative bloggers. *Cyberpsychology, Behavior, and Social Networking* 16(3):194-199.

Kotler, P. and Zaltman, G. 1971. Social marketing: an approach to planned social change. *Journal of Marketing* 35(3): 3-12.

Kula, E. 2001. Islam and environmental conservation. *Environmental Conservation* 28:1-9.

Kushwah, V.S., Sisodia, R. and Bhatnagar, C. 2017. Magico-religious and social belief of tribals of district Udaipur, Rajasthan. *Journal of Ethnobiology and Ethnomedicine* 13(1):69.

Kwara State of Nigeria. 1997. *Kwara State Diary*. Ilorin, Nigeria: Government Press.

Lamont, M. and Swidler, A. 2014. Methodological pluralism and the possibilities and limits of interviewing. *Qualitative Sociology* 37: 153-171.

LaPan, C., 2013. Review of QDA Miner. *Social Science Computer Review* 31(6): 774-778.

Latitude. 2021a. *Ibadan*. Latitude website [online] https://latitude.to/map/ng/nigeria/cities/ibadan Accessed 4 June, 2021.

_____. 2021b. *Abeokuta*. Latitude website [online] https://latitude.to/map/ng/nigeria/cities/abeokuta Accessed 4 June, 2021.

_____. 2021c. *Ijebu-Ode*. Latitude website [online] https://latitude.to/map/ng/nigeria/cities/ijebu-ode Accessed 4 June, 2021.

Lawrence, R.L. and Paige, D.S. 2016. What our ancestors knew: Teaching and learning through storytelling. *New Directions for Adult and Continuing Education* 149:63-72.

Leeming, D. 2018. The use of theory in qualitative research. *Journal of Human Lactation* 34 (4): 668-673.

Levin, I. and Mamlok, D. 2021. Culture and Society in the Digital Age. *Information* 12(2): 68:1-13.

Lischka, S.A., Teel, T.L., Johnson, H.E., Reed, S.E., Breck, S., Carlos, A.D. and Crooks, K.R. 2018. A conceptual model for the integration of social and ecological information to understand human-wildlife interactions. *Biological Conservation* 225: 80-87.

López-Mosquera, N., García, T. and Barrena, R., 2014. An extension of the Theory of Planned Behavior to predict willingness to pay for the conservation of an urban park. *Journal of Environmental Management* 135: 91-99.

Macovei, O.I. 2015. Applying the theory of planned behavior in predicting pro-environmental behaviour: The case of energy conservation. *Acta Universitatis Danubius. Œconomica* 11(4): 15-32.

Macrotrends LLC. 2021a. *Ibadan, Nigeria Metro Area Population 1950-2021*. Macrotrends website [online] https://www.macrotrends.net/cities/21990/ibadan/population Accessed 4 June, 2021.

_____. 2021b. *Ilorin, Nigeria Metro Area Population 1950-2021*. Macrotrends website [online] https://www.macrotrends.net/cities/21998/ilorin/population Accessed 4 June, 2021.

_____. 2021c. *Abeokuta, Nigeria Metro Area Population 1950-2021*. Macrotrends website [online] https://www.macrotrends.net/cities/21975/abeokuta/population Accessed 4 June, 2021.

_____. 2021d. *Ijebu-Ode, Nigeria Metro Area Population 1950-2021*. Macrotrends website [online] https://www.macrotrends.net/cities/21992/ijebu-ode/population Accessed 4 June, 2021.

Makadok, R., Burton, R. and Barney, J. 2018. A practical guide for making theory contributions in strategic management. *Strategic Management Journal* 39: 1530-1545.

Maleksaeidi, H. and Keshavarz, M. 2019. What influences farmers' intentions to conserve on-farm biodiversity? An application of the theory of planned behavior in fars province, Iran. *Global Ecology and Conservation* 20: 00698.

Manfredo, M. J., Sullivan, L., Salerno, J. and Berger, J. 2020. Looking Forward, Not Backward in Considering the Needs for Social Science in Wildlife Management. *BioScience* 70(7):529-530.

Mangunjaya, F.M. and Praharawati, G. 2019. Fatwas on boosting environmental conservation in Indonesia. *Religions* 10:570. https://doi.org/10.3390/rel10100570

Mannetti, L., Pierro, A., Livi, S. 2004. Recycling: planned and self-expressive behavior. *Journal of Environmental Psychology* 24(2):227–236.

Margalida, A. and Colomer, M.À. 2012. Modelling the effects of sanitary policies on European vulture conservation. *Scientific reports* 2(1):1-7.

Marié, É. 2011. The Transmission and Practice of Chinese Medicine. An Overview and Outlook. *China Perspectives* 2011: 5-13.

Markandya, A., Taylor, T., Longo, A., Murty, M.N., Murty, S. and Dhavala, K. 2008. Counting the cost of vulture decline—an appraisal of the human health and other benefits of vultures in India. *Ecological Economics* 67: 194-204.

Martin, E. and Vigne, L. 2013. Lagos, Nigeria: One of the largest retail centers for illegal ivory surveyed till date. *TRAFFIC Bulletin* 25(1): 35-40.

Martinez, R., Green, K.M. and DeWan, A. 2013. Establishing reciprocal agreements for water and biodiversity conservation through a social marketing campaign in Quanda Watershed, Peru. *Conservation Evidence* 10: 42-47.

Mascia, M.B., Brosius, J.P., Dobson, T.A., Forbes, B.C., Horowitz, L., McKean, M.A. and Turner, N.J. 2003. Conservation and the social sciences. *Conservation Biology* 17(3): 649-650.

Mason, P. 1999. Zoos as heritage tourism attractions: A neglected area of research? *International Journal of Heritage Studies* 5(3–4): 193–202.

McKay, J.E., Mangunjaya, F.M., Dinata, Y., Harrop, S.R. and Khalid, F. 2014. Practice what you preach: a faith-based approach to conservation in Indonesia. *Oryx* 48:23-29.

Mcleod, E. and Palmer, M. 2015. Why conservation needs religion. *Coastal Management* 43:238-252.

Merem, E.C., Twumasi, Y., Wesley, J., Isokpehi, P., Fageir, S., Crisler, M., Romorno, C., Hines, A., Ochai, G.S., Leggett, S. and Nwagboso, E. 2018. Assessing the menace of illegal wildlife trade in the Sub-Saharan African region. *Advances in Life Sciences* 8(1): 1-25.

Milner-Gulland, E.J. 2018. Documenting and tackling the illegal wildlife trade: change and continuity over 40 years. *Oryx* 52(4):597-598.

Mommersteeg, G. 1990. Allah's words as amulet. *Etnofoor* (1): 63-76.

Mooney-Somers, J., Perz, J. and Ussher, J.M. 2008. A complex negotiation: Women's experiences of naming and not naming premenstrual distress in couple relationships. *Women & Health* 47(3): 57-77.

Morcatty, T.Q., Bausch Macedo, J.C., Nekaris, K.A.I., Ni, Q., Durigan, C.C., Svensson, M.S. and Nijman, V. 2020. Illegal trade in wild cats and its link to Chinese-led development in Central and South America. *Conservation Biology* 34(6): 1525-1535.

Morgan, J. and Chng, S. 2018. Rising internet-based trade in the Critically Endangered ploughshare tortoise Astrochelys yniphora in Indonesia highlights need for improved enforcement of CITES. *Oryx* 52(4): 744-750.

Mundy, P., Butchart D., Ledger, J. and Piper, S. 1992. *The vultures of Africa*. Johannesburg, South Africa: Acorn Books and Russel Friedman Books.

Mutum, R. 2015. *Nigeria: ICPC Returns N1 Billion Looted Funds to Environment Ministry.* AllAfrica website [online] https://allafrica.com/stories/201509160545.html Accessed 4 June, 2021.

National Geographic Society. 2013. *The history of the ivory trade*. National Geographic Society website [online] https://www.nationalgeographic.org/media/history-ivory-trade/ Accessed 27 March, 2021.

National Population Commission (NPC). 2004. Basic education profile for southwest Nigeria. National Population Commission website [online] https://tinyurl.com/y2na34qw Accessed 15 January, 2021.

Naylor, R.T. 2005. The underworld of ivory. *Crime, Law and Social Change* 42(4-5): 261-295.

NBS (National Bureau of Statistics). 2021. *Labor force statistics: Unemployment and underemployment report*. NBS website [online] https://tinyurl.com/2fpxsm8r Accessed 4 June, 2021.

Negi, C.S. 2005. Religion and biodiversity conservation: not a mere analogy. *The International Journal of Biodiversity Science and Management* 1:85-96.

Nekaris, K.A.I., Shepherd, C.R., Starr, C.R., and Nijman, V. 2010. Exploring cultural drivers for wildlife trade via an ethnoprimatological approach: a case study of slender and slow lorises (*Loris* and *Nycticebus*) in South and Southeast Asia. *American Journal of Primatology* 72(10): 877-886.

Nellemann, C., Henriksen, R., Raxter, P., Ash, N., Mrema, E. eds. 2014. *The environmental crime crisis – Threats to sustainable development from illegal exploitation and trade in wildlife and forest resources.* A UNEP Rapid Response Assessment. United Nations Environment Programme and GRID-Arendal, Nairobi and Arendal.

Nijman, V. 2010. An overview of international wildlife trade from southeast Asia. *Biodiversity Conservation* 19: 1101-1114.

_____., Morcatty, T., Smith, J.H., Atoussi, S., Shepherd, C.R., Siriwat, P., Nekaris, K.A.I. and Bergin, D. 2019. Illegal wildlife trade–surveying open animal markets and online platforms to understand the poaching of wild cats. *Biodiversity* 20(1): 58-61.

Nikolaus, G. 2001. Bird exploitation for traditional medicine in Nigeria. *Malimbus* 23: 45-55

_____. 2011. The fetish culture in West Africa: An ancient tradition as a threat to endangered birdlife? In *Tropical vertebrates in a changing world*, ed. K.L Schuchmann, 145-151. Bonner Zoologische Monographien, Zoologisches Forschungsmuseum Alexander Koenig, Bonn.

Norenzayan, A. and Atran, S. 2004. Cognitive and emotional processes in the cultural transmission of natural and nonnatural beliefs. In *Psychological foundations of culture*, eds. M. Schaller and C. S. Crandall, 149–169. Mahwah, NJ: Lawrence Erlbaum Associates.

O'Dwyer, B., 2004. Qualitative data analysis: illuminating a process for transforming a 'messy' but 'attractive' 'nuisance'. In *The real-life guide to accounting research*, eds. C. Humphrey and B. Lee, 391-407, Elsevier.

Office of The Dalai Lama. 2006. *Animal Skin Clothes Burned in Tibet After Dalai Lamas Call*. Office of The Dalai Lama website [online] https://www.dalailama.com/news/2006/animal-skin-clothes-burned-in-tibet-after-dalai-lamas-call Accessed 17 February, 2021.

Ogada, D., Shaw, P., Beyers, R.L., Buij, R. *et al*. 2016. Another continental vulture crisis: Africa's vultures collapsing toward extinction. *Conservation Letters* 9: 89-97.

_____. and Buij, R. 2011. Large declines of the Hooded Vulture *Necrosyrtes monachus* across its African range. *Ostrich* 82: 101-113.

_____., Keesing, F., and Virani, M.Z. 2011. Dropping dead: causes and consequences of vulture population declines worldwide. *Annals of the New York Academy of Sciences*. doi:10.1111/j.1749-6632.2011.06293.x1-15.

_____., Torchin, M.E., Kinnaird, M.F. and Ezenwa, V.O. 2012. Effects of vulture declines on facultative scavengers and potential implications for mammalian disease transmission. *Conservation Biology* 26: 453-460.

Ojo, A.T. 2019. Yoruba folktales: An instrument for socio-cultural education in a democratic setting. *Nigerian Journal of African Studies* (NJAS) 1(1):1-10.

Okeke, C.O., Ibenwa, C.N. and Okeke, G.T. 2017. Conflicts between African traditional religion and christianity in eastern Nigeria: The Igbo example. *Sage Open* 7(2).

Olabisi, O.E., Awonusi, A.J. and Adebayo, O.J. 2008. Assessment of bacteria pollution of shallow well water in Abeokuta, Southwestern Nigeria. *Life Science Journal* 5: 59-65.

Olawuyi, D.S. and Olusegun, O.O. 2018. Achieving the United Nations sustainable development goals on biological diversity in Nigeria: Current issues and future directions. *Global Journal of Comparative Law* 7(1):37-60.

Olayemi, I.K. and Ande, A.T. 2008. Survivorship of *Anopheles gambiae* in relation to malaria transmission in Ilorin, Nigeria. *Online Journal of Health and Allied Sciences* 7: 1-5.

Olivier, J. 2016. Interventions with local faith communities on immunization in development contexts. *The Review of Faith & International Affairs* 14:36-50.

Olusola, A.G. 2005. Animals in the Traditional Worldview of the Yoruba. *Folklore: Electronic Journal of Folklore* 30:155-172.

Onyango, P. 2001. Working with religious leaders to prevent the spread of HIV/AIDS in Senegal. In *FHI/UNAIDS best practices in HIV/AIDS prevention collection,* eds. B. Makinwa and M. O'Gardy, 161–174. Research Triangle Park, North Carolina: Family Health International. [online] tinyurl.com/klsq6gnq Accessed 9 February, 2021.

Osumah, O. 2013. Boko Haram insurgency in northern Nigeria and the vicious cycle of internal insecurity. *Small Wars & Insurgencies* 24(3):536-560.

Oyebamiji, D.A., Ebisike, A.N., Egede, J.O. and Hassan, A.A. 2018. Knowledge, attitude, and practice with respect to soil contamination by Soil-Transmitted Helminths in Ibadan, Southwestern Nigeria. *Parasite Epidemiology and Control* 3: p.e00075.

Oyekale, A.S. and Ige, R.F. 2012. Urban house holds' assessment of environmental safety: A case study of Ibadan, Nigeria. *Bulgarian Journal of Science & Education Policy* 6: 117-129.

Oyeneye, O.Y. and Kawonise, S. 1993. Sexual networking in Ijebu-Ode, Nigeria: an exploratory study. *Health Transition Review* pp.171-183.

Pariona, A. 2017. *What is the role of vultures in the ecosystem and wildlife conservation?* World Atlas website [online] https://www.worldatlas.com/articles/what-is-the-role-of-vultures-in-the-ecosystem-and-wildlife-conservation.html Accessed 11 April, 2021.

Parmenter, R.R. and MacMahon, J.A. 2009. Carrion decomposition and nutrient cycling in a semiarid shrub–steppe ecosystem. *Ecological Monographs* 79: 637-661.

Parsons, T. and Bales, R.F. 1955. *Family, socialization, and interaction process*. Illinois: The Press.

Perrig, P.L., Lambertucci, S.A., Donadio, E., Padró, J. and Pauli, J.N. 2019. Monitoring vultures in the 21st century: the need for standardized protocols. *Journal of Applied Ecology* 56(4): 796-801.

Phelps, J., Biggs, D. and Webb, E.L. 2016. Tools and terms for understanding illegal wildlife trade. *Frontiers in Ecology and the Environment* 14(9): 479-489.

Pluskowski, A. 2004. Narwhals or unicorns? Exotic animals as material culture in medieval Europe. *European Journal of Archaeology* 7(3): 291–313.

Prakash, V. 1999. Status of vultures in Keoladeo National Park, Bharatpur, Rajasthan, with special reference to population crash in *Gyps* species. Journal of the Bombay Natural History Society 96:365–378.

Price, R. 2017. Economic drivers and effects of the illegal wildlife trade in Sub-Saharan Africa. K4D Helpdesk Report. Brighton, UK: Institute of Development Studies.

Provalis Research. 2020. QDA Miner. Provalis Research website [online] https://provalisresearch.com/products/qualitative-data-analysis-software/freeware/ Accessed 17 April, 2021.

Raemaekers, S., and P. Britz 2009. "Profile of the illegal abalone fishery (Haliotis midae) in the Eastern Cape Province, South Africa: Organized pillage and management failure". *Fisheries Research* 97: 183 – 195.

Rankin, P., Hansteen-Izora, R. and Packer, L. 2007. *Living Cultural Storybases: Self-empowering narratives for minority cultures.* Peer-reviewed paper for the International Community Informatics Conference on 'Constructing and sharing memory: community informatics, identity and empowerment', CIRN Prato Italy, October 9-11th, 2006. The Citeseer website [online] https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.463.1426&rep=rep1&type=pdf Accessed 9 February, 2021.

Rappaport, R. A. 1979. *Ecology, meaning and religion. 2nd edition*. Berkeley, California: North Atlantic Books.

_____. 1999. *Ritual and religion in the making of humanity*. Cambridge, United Kingdom: Cambridge University Press.

Reeves, S., Peller, J., Goldman, J. and Kitto, S. 2013. Ethnography in qualitative educational research: AMEE Guide No. 80. *Medical Teacher* 35: e1365-e1379.

Reyes-García, V., Broesch, J., Calvet-Mir, L., Fuentes-Peláez, N., McDade, T.W., Parsa, S., Tanner, S., Huanca, T., Leonard, W.R., Martínez-Rodríguez, M.R. and TAPS Bolivian Study Team. 2009. Cultural transmission of ethnobotanical knowledge and skills: an empirical analysis from an Amerindian society. *Evolution and Human Behavior* 30(4): 274-285.

Rhodes, R.E., Bruijn, G.D. 2013. How big is the physical activity intention – behavior gap? A meta-analysis using the action control framework. *British Journal of Health Psychology* 18:296–309.

Richetin, J., Perugini, M., Conner, M., Adjali, I., Hurling, R., Sengupta, A., Greetham, D. 2012. To reduce and not to reduce resource consumption? That is two questions. *Journal of Environmental Psychology* 32(2):112–122.

Riebl, S.K., Estabrooks, P.A., Dunsmore, J.C., Savla, J., Frisard, M.I., Dietrich, A.M., *et al*., 2015. A systematic literature review and meta-analysis: the theory of planned behavior's application to understand and predict nutrition-related behaviors in youth. *Eating Behaviors* 18:160–178.

Rijkelijkhuizen, M. 2009. Whales, walruses, and elephants: Artisans in ivory, baleen, and other skeletal materials in seventeenth-and eighteenth-century Amsterdam. *International Journal of Historical Archaeology* 13(4): 409–429.

Robinson, B.S., Creasey, M.J., Skeats, A., Coverdale, I. and Barlow, A. 2019. Global survey reveals a lack of social marketing skills in the conservation sector and shows supply of training doesn't meet demand. *Social Marketing Quarterly* 25(1), pp.9-25.

Roe, D. and Booker, F. 2019. Engaging local communities in tackling illegal wildlife trade: A synthesis of approaches and lessons for best practice. *Conservation Science and Practice* 1(5):e26.DOI: 10.1111/csp2.26.

Roe, D., Dickman, A., Kock, R., Milner-Gulland, E.J. and Rihoy, E. 2020. Beyond banning wildlife trade: COVID-19, conservation, and development. *World Development* 136: 105121.

Rosen, G.E. and Smith, K.F. 2010. Summarizing the evidence on the international trade in illegal wildlife. *EcoHealth* 7(1): 24-32.

Rubiano A., M.P. 2021. *Growing demand for vulture heads threatens the birds' survival in Africa. Audubon Magazine website* [online] https://www.audubon.org/news/growing-demand-vulture-heads-threatens-birds-survival-africa Accessed 27 April, 2021.

Ruona, W.E.A. 2005. Analyzing qualitative data. In *Research in organizations: Foundations and methods of inquiry*, eds. Swans and E.F Holton III, 233-263. San Francisco, California: Berrett-Koehler Publishers Inc.

Safford, R., Andevski, J., Botha, A., Bowden, C.G., Crockford, N., Garbett, R., Margalida, A., Ramírez, I., Shobrak, M., Tavares, J. and Williams, N.P. 2019. Vulture conservation: the case for urgent action. *Bird Conservation International* 29(1): 1-9.

Saidu, Y. and Buij, R. 2013. Traditional medicine trade in vulture parts in northern Nigeria. *Vulture News* 65:4-14.

Sanni, A. 2002. Diagnosis through rosary and sand: Islamic elements in the healing custom of the Yoruba (Nigeria). *Medicine & Law* 21:295-306.

Sanjari, M., Bahramnezhad, F., Fomani, F.K., Shoghi, M. and Cheraghi, M.A. 2014. Ethical challenges of researchers in qualitative studies: The necessity to develop a specific guideline. *Journal of Medical Ethics and History of Medicine* 7 (14): 1-6.

Santangeli, A., Girardello, M., Buechley, E., Botha, A., Minin, E. Di and Moilanen, A. 2019. Priority areas for conservation of Old World vultures. *Conservation Biology* 33(5): 1056–1065.

Sanu, O.O. 2020. *Cultural Aspects of African Folktales: A Comparative Study of The Yorúbá and The Maasai Folktales*. Masters Thesis. University of Georgia, Georgia.

Sauro, J. 2015. 4 types of observational research. MeasuringU website [online] https://measuringu.com/observation-role/ Accessed 17 April, 2021.

SAVE (Save Asia's Vultures from Extinction). undated. *SAVE*. SAVE website [online] https://save-vultures.org/ Accessed 4 June, 2021.

Save The Elephants. 2021. *Threats to elephants*. Save The Elephants website [online] https://www.savetheelephants.org/about-elephants-2-3-2/threats-to-elephants/ Accessed 27 March, 2021.

Save The Rhino. 2021a. *Rhino-info*. Save The Rhino website [online] https://www.savetherhino.org/rhino-info/threats/poaching-rhino-horn/ Accessed 27 March, 2021.

Save The Rhino. 2021b. *Poaching stats*. Save The Rhino website [online] https://www.savetherhino.org/rhino-info/poaching-stats/?cn-reloaded=1 Accessed 4 June, 2021.

Schenck, M., Effa, E.N., Starkey, M., Wilkie, D., Abernethy, K., Telfer, P., Godoy, R. and Treves, A. 2006. Why people eat bushmeat: results from two-choice, taste tests in Gabon, Central Africa. *Human Ecology* 34(3): 433-445.

Schönpflug, U. 2008. Theory and research in cultural transmission: A short history. In *Cultural transmission: psychological, developmental, social, and methodological aspects*, ed. U. Schönpflug, 9-30. UK: Cambridge University Press.

Schwartz, S.H. and Bilsky, W. 1987. Toward a universal psychological structure of human values. *Journal of Personality and Social Psychology* 53:550-562.

Sharma, S., Sharma, H.P., Katuwal, H.B., Chaulagain, C. and Belant, J.L. 2020. People's knowledge of illegal Chinese pangolin trade routes in central Nepal. *Sustainability* 12(12):4900.

Shelby, A. and Ernst, K. 2013. Story and science: how providers and parents can utilize storytelling to combat anti-vaccine misinformation. *Human Vaccines & Immunotherapeutics* 9:1795-1801.

Shepherd, C.R., Connelly, E., Hywood, L. and Cassey, P. 2016. Taking a stand against illegal wildlife trade: the Zimbabwean approach to pangolin conservation. *Oryx* 51(2): 280-285.

Sikich, W. 2020. *5 facts about unemployment in Nigeria*. The Borgen Project website [online] https://borgenproject.org/5-facts-about-unemployment-in-nigeria/ Accessed 15 January, 2021.

Smith, M. 2015. *The Saigon horn*. Wordpress website [online] https://micsmithgeographic.wordpress.com/2015/03/02/the-saigon-horn/ Accessed 17 April, 2021.

Sniehotta, F.F., Presseau, J. and Araújo-Soares, V. 2014. Time to retire the theory of planned behaviour. *Health Psychology Review* 8(1): 1-7.

Sodeinde, O.A. and Soewu, D.A. 1999. Pilot study of the traditional medicine trade in Nigeria. *Traffic Bulletin-Cambridge-Traffic International* 18: 35-40.

Soewu, D.A. and Ayodele, I.A. 2009. Utilisation of pangolin (*Manis sp.*) in traditional Yorubic medicine in Ijebu province, Ogun State, Nigeria. *Journal of Ethnobiology and Ethnomedicine* 5(1): 1-11.

_____., Bakare, O.K. and Ayodele, I.A. 2012. Trade in wild mammalian species for traditional medicine in Ogun State, Nigeria. *Global Journal of Medical Research* 12(3): 6-22.

Sofidiya, M.O., Odukoya, O.A., Afolayan, A.J. and Familoni, O.B. 2007. Survey of anti-inflammatory plants sold on herb markets in Lagos Nigeria. *International Journal of Botany* 3(3):302-306.

St John, F.A., Edwards-Jones, G. and Jones, J.P. 2010. Conservation and human behaviour: lessons from social psychology. *Wildlife Research* 37(8): 658-667.

Steinberg, J. 2005. The illicit abalone trade in South Africa. *Institute for Security Studies Papers* 2005(105): 1-16.

Stern, M.J., 2008. Coercion, voluntary compliance and protest: the role of trust and legitimacy in combating local opposition to protected areas. *Environmental Conservation* 3: 200-210.

Strauss, A. and Corbin, J. 1998. *Basics of qualitative research: Techniques and procedures for developing grounded theory.* 2nd ed. Thousand Oaks, California: Sage Publications.

Sudarkasa, N. 1973. *Where women work: a study of Yoruba women in the marketplace and in the home* (Vol. 53). University of Michigan Museum Anthro Archaeology.

't Sas-Rolfes, M., Challender, D. W. S., Hinsley, A., Veríssimo, D. and Milner-Gulland, E. J. 2019. Illegal wildlife trade: Patterns, processes, and governance. *Annual Review of Environment and Resources* 44(14): 1–28.

Taneja, H. and Wu, A.X. 2014. Does the Great Firewall Really Isolate the Chinese? Integrating Access Blockage with Cultural Factors to Explain Web User Behavior. *The Information Society* 30(5): 297–309.

The Eagle Online. 2021. Ancestral worship is idolatry in Islam — Cleric. The Eagle Online website [online] https://theeagleonline.com.ng/ancestral-worship-is-idolatry-in-islam-cleric/ Accessed 26 February, 2021.

The National Wildlife Species Protection Act. 2015. The Federal Ministry of Environment, Abuja, Nigeria.

The World Factbook, Central Intelligence Agency. 2021. *Nigeria*. Central Intelligence Agency website [online] https://www.cia.gov/library/publications/the-world-factbook/geos/ni.html Accessed 12 July, 2021.

Thiollay, J.M. 2006. The decline of raptors in West Africa: long-term assessment and the role of protected areas. *Ibis* 148(2): 240-254.

Thomas-Walters, L., Cheung, H., Lee, T.M., Wan, A.K.Y. and Wang, Y. 2020. Targeted values: The relevance of classical Chinese philosophy for illegal wildlife demand reduction campaigns. *People and Nature* 2:964–971. https://besjournals.onlinelibrary.wiley.com/doi/pdf/10.1002/pan3.10127.

Timm, S.N. and Deal, B.M. 2016. Effective or ephemeral? The role of energy information dashboards in changing occupant energy behaviors. *Energy Research & Social Science* 19:11–20.

Toledo, L.F., Asmüssen, M.V. and Rodríguez, J.P. 2012. Track illegal trade in wildlife. *Nature* 483(7387): 36.

Trommsdorff, G. 2008. Intergenerational relations and cultural transmission. In *Cultural transmission: psychological, developmental, social, and methodological aspects*, ed. U. Schönpflug, 126-160. UK: Cambridge University Press.

Truong, V.D., Dang, N.V. and Hall, C.M. 2016. The marketplace management of illegal elixirs: illicit consumption of rhino horn. *Consumption Markets & Culture* 19: 353-369.

UN (United Nations Security Council). 2013. *Report of the Secretary-General on the activities of the United Nations Regional Office for Central Africa and on the Lord's Resistance Army-affected areas*. S/203/67l: 1-16.

UNAIDS. 1999. *Acting early to prevent AIDS: The case of Senegal*. UNAIDS website [online] tinyurl.com/fd9ung4j Accessed 10 February 2021.

UNEP-WCMC. 2021. *West African vultures: A review of trade and sentinel poisoning*. Cambridge: UNEP-WCMC.

UNODC (United Nations Office on Drugs and Crime). 2013. *Transnational organized crime in East Asia and the Pacific: A threat assessment*. Bangkok: UNODC.

_____. 2016. *World wildlife crime report: Trafficking in protected species*. Vienna: UNODC.

Valente, T. and Davis, R. 1999. Accelerating the Diffusion of Innovations Using Opinion Leaders. *Annals of the American Academy of Political and Social Science* 566:55–67.

Valente, T.W. and Pumpuang, P. 2007. Identifying opinion leaders to promote behavior change. *Health Education and Behavior* 34:881-896.

van den Ban, A. W. 1963. "Hoe Vinden Nieuwe Landbouwmethodeningand" (How a New Practice Is Introduced), Landbouwvoorlichting, 20:227-239.

van Uhm, D.P. 2016. *The illegal wildlife trade: Inside the world of poachers, smugglers, and traders* (Vol. 15), 1-341. Switzerland: Springer.

Varrella, S. 2020. Literacy rate in Nigeria 2018, by zone and gender. Statista website [online] https://www.statista.com/statistics/1124745/literacy-rate-in-nigeria-by-zone-and-gender/ Accessed 20 August, 2021.

Vazquez-Garcia, V. 2008. Gender, ethnicity, and economic status in plant management: Uncultivated edible plants among the Nahuas and Popolucas of Veracruz, Mexico. *Agriculture and Human Values* 25(1):65-77.

Voeks, R.A. 2007. Are women reservoirs of traditional plant knowledge? Gender, ethnobotany and globalization in northeast Brazil. *Singapore Journal of Tropical Geography* 28(1):7-20.

Wald, K. D. and Calhoun-Brown, A. 2007. *Religion and politics in the United States. 5th edition*. Lanham, MD: Roman and Littlefield Publishers Inc.

Walker, J.A. 2015. Engaging Islamic opinion leaders on child marriage: Preliminary results from pilot projects in Nigeria. *The Review of Faith and International Affairs* 13:48-58.

_____., Hashim, Y., and Oranye, N. 2019. Impact of Muslim opinion leaders' training of healthcare providers on the uptake of MNCH services in Northern Nigeria. *Global Public Health* 14:200-213.

Wan, C., Shen, G.Q., Choi, S. 2017. Experiential and instrumental attitudes: interaction effect of attitude and subjective norm on recycling intention. *Journal of Environmental Psychology* 50:69–79.

Warchol, G.L. 2004. The transnational illegal wildlife trade. *Criminal Justice Studies* 17:57-73.

Welch, M.R., Leege, D.C., Wald, K.D. and Kellstedt, L.A. 1993. Are the sheep hearing the shepherds? Cue perceptions, congregational responses, and political communication processes. In *Rediscovering the religious factor in American politics*, eds. D. C. Leege and L. A. Kellstedt, 235–254. Armonk, NY: M.E. Sharpe.

Weliange, W.S., Kolawole, R.A., Prasannajith, N.S., Afolabi, A.S. and Ameachi, E.C. 2015. Ethno-Ornithological knowledge and uses of birds in Omiaro and Labaka villages, Kwara State, Nigeria. *Malimbus* 36: 41-54.

Wellman, B. and Wortley, S. 1990. Different strokes from different folks: Community ties and social support. *American Journal of Sociology* 96(3):558-588.

Whiting, M.J., Williams, V.L. and Hibbitts, T.J. 2013. Animals traded for traditional medicine at the Faraday market in South Africa: species diversity and conservation implications. In *Animals in traditional folk medicine*, eds. R. R. N. Alves and I. L. Rosa, 421-473. Berlin, Heidelberg: Springer.

Wikimedia Commons. 2019. *Imepe new market.jpg*. Wikimedia Commons website [online] https://commons.wikimedia.org/wiki/File:Imepe_new_market.jpg Accessed 4 June, 2021.

WildAid. 2018. *Sharks*. WildAid website [online] https://wildaid.org/programs/sharks/ Accessed 17 April, 2021.

Williams, J.P. 2008. *Non-participant observation*. Thousand Oaks, CA, USA: Sage Publications.

Williams, M. and Moser, T. 2019. The art of coding and thematic exploration in qualitative research. *International Management Review* 15(1): 45-55.

Wilson-Wilde, L. 2010. Wildlife crime: a global problem. *Forensic Science, Medicine, and Pathology* 6(3): 221-222.

Wittemyer, G., Northrup, J.M., Blanc, J., Douglas-Hamilton, I., Omondi, P. and Burnham, K.P. 2014. Illegal killing for ivory drives global decline in African elephants. *Proceedings of the National Academy of Sciences* 111(36):13117-13121.

World Bank. 2016. *Analysis of international funding to tackle illegal wildlife trade*. Washington, D.C.: World Bank Group. https://openknowledge.worldbank.org/handle/10986/25340 License: CC BY 3.0 IGO.

_____. 2017. *Individuals using the internet (% of population): Vietnam*. World Bank website [online] https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=VN Accessed 17 April, 2021.

WWF (World Wide Fund for Nature). 2020. Second-biggest direct threat to species after habitat destruction. WWF website [online] https://wwf.panda.org/discover/our_focus/wildlife_practice/problems/illegal_trade/? Accessed 27 March, 2021.

Wyler, L.S. and Sheikh, P.A. 2008. *International illegal trade in wildlife: threats and US policy.* Library of Congress Washington DC Congressional Research Service.

Yankuzo, K.I. 2014. Impact of globalization on the traditional African cultures. *International Letters of Social and Humanistic Sciences* (15):1-8.

Yunusa, B. 2008. Is the wind of change blowing? A Study of Socio-cultural Context of Access to a Place to Sell in Zaria, Nigeria. *Journal of Geography and Regional Planning* 1(9):151-163.

Yuriev, A., Dahmen, M., Paillé, P., Boiral, O. and Guillaumie, L. 2020. Pro-environmental behaviors through the lens of the theory of planned behavior: A scoping review. *Resources, Conservation and Recycling* 155: 104660.

Zarocostas, J. 2004. UNICEF taps religious leaders in vaccination push. *The Lancet* 363(9422):1709. https://doi.org/10.1016/S0140-6736(04)16294-6.

Zubair, M. and Garforth, C. 2006. Farm level tree planting in Pakistan: the role of farmers' perceptions and attitudes. *Agroforestry Systems* 66(3): 217-229.

Zuberogoitia, I., Zabala, J., Martínez, J.A., Martínez, J.E. and Azkona, A. 2008. Effect of human activities on Egyptian vulture breeding success. *Animal Conservation* 11(4): 313-320.

Zwack, M., Kraiczy, N.D., von Schlippe, A. and Hack, A. 2016. Storytelling and cultural family value transmission: Value perception of stories in family firms. *Management Learning* 47:590-614.

# Appendices

## Appendix 1

### Ethnographic Research Method

### Interview Protocol A

### Stephen Awoyemi

Good morning/ afternoon Sir/Madam, my name is Stephen Awoyemi, and I am carrying out a study for a degree in Environmental Sciences and Policy at the Central European University. This study will contribute efforts to increasing knowledge about vulture populations in Nigeria. Your answers to my interview will remain strictly confidential. There are no right or wrong answers, or desirable or undesirable answers. I would like you to feel comfortable saying what you really think and how you really feel. If it is okay with you, I will be recording our conversation since it is hard for me to write down everything while simultaneously carrying an attentive conversation with you. Your name is not required and will not go with the results of this study as you will be anonymous. Based on your consent, I will be spending 1-2 weeks in your stall to get to understand your profession by observing you. You will benefit from this study by receiving a copy of the report of the study if you wish. If you require more info my contact number is 09081720676.

### A.1. Background of Traders

1. Let us begin by discussing your work as a trader. How did you come to do this trade?
2. Most of what I know about this trade is what I have read in books. I would like to hear from you the trader. Please tell me about how you learned this trade.
3. So, tell me, how old were you when you began your learning?
4. How old were you when you took over the trade?
5. Have you by any means taught anyone this trade? Can you explain why?
6. Many members of society are affiliated to one club or the other. Are you a member of any club? What is your experience in this club?
7. Tell me about the occupation of the people of this club?

8. Can you explain how this club has been helpful to your business?

9. Are you a member of any trade union?

10. What is the name of the trade union?

11. Can you explain how this trade union has been helpful to your business?

12. Between the club and trade union which one influences your behavior to sell traditional medicine the most?

13. What do you think of an alternative occupation with higher daily income?

**A.2. Socio-demographic data**

Let me conclude by getting some information about you, please, tell me about your background [the questions below will be asked if they are missed in the background information]:

14. How old are you?

15. Gender (this question will not be asked but answered through observation):

16. What is your religion?

17. What is your ethnic Group?

18. What is your level of education?

Thank you for your time! Please let me know if you have any questions or have anything more to add.

**B.1. Buyers of vulture parts (Socio-demographic data)**

Let us begin by meeting you and getting some information about you. Please tell me about your background. [the questions below will be asked if they are missed in the background information].

1. How old are you?
2. Gender (this question will not be asked but answered through observation)
3. What is your religion?
4. What is your ethnic group?
5. What is your level of education?

**B.2. Background for buyers**

6a. Can you please tell me the importance of this vulture part you purchased and what it is used for?

6b. Interesting. Are you the one going to use this vulture part?

a. YES → 6c. Can you please tell me how you learnt vulture parts may be good for use?

b. NO

7. Have you recommended vulture parts for any one's use? Why and who is this person to you?

8. How old were you when you first believed vulture parts may be good for use?

9. What do you think of using alternative remedies to using vulture parts?

10. Are you a member of any club?

11. Does your club encourage you to use traditional medicine? Can you explain why?

12. How would you describe your club members and their use of traditional medicine?

Thank you for your time! Please let me know if you have any questions or have anything more to add.

**C. Policy Institutions (Designated staff of the Federal Ministry of Environment)**

Let's begin by discussing your experience so far in this position.

1. What is your role and what has been your experience in executing this role?

2a. We will now narrow down to a species of international importance. What do you know about vultures in Nigeria?

YES → 2b. What do you think is responsible for their decline in Nigeria?

NO

3. In what ways do you think this decline can be controlled?

4a. Is there any legislation against killing of vultures?

YES → 4b. How is this legislation enforced?
NO

5. Tell me about any challenges faced in enforcing legislation, if any.

Thank you for your time! Please let me know if you have any questions or have anything more to add.

**Ethnographic Research Method**

**Interview Protocol B [end of field work]**

**Stephen Awoyemi**

Good morning/ afternoon Sir/Madam, my name is Stephen Awoyemi, and I am carrying out a study for a degree in Environmental Sciences and Policy at the Central European University. This study will contribute efforts to increasing knowledge about vulture populations in Nigeria. Your answers to my interview will remain strictly confidential. There are no right or wrong answers, or desirable or undesirable answers. I would like you to feel comfortable saying what you really think and how you really feel. If it's okay with you, I will be recording our conversation since it is hard for me to write down everything while simultaneously carrying an attentive conversation with you. Your name is not required and will not go with the results of this study as you will be anonymous. **However, the summary of the outcome of this interview would be published in my report and any other relevant journal if you agree.** You will benefit from this study by receiving a copy of the report of the study if you wish.

**Policy Institutions (Designated staff of the Federal Ministry of Environment)**

1. How would you explain the deployment of enforcement officers to control the illegal wildlife trade in southwestern Nigeria?

2. If the following components are not included in the respondent's narrative, I will ask when the deployment of enforcement officers was initiated and if it still ongoing. Other questions would be if there is any external donor support and if so, who?

3. How many arrests have been made in the last 3 years with respect to the illegal trade of wildlife (esp. vultures)? How much in fines have been collected? How many people are behind bars?

4. How would FMEnv describe its working relationship with e.g., the police? Anti-crime units that focus on organized crime? etc.

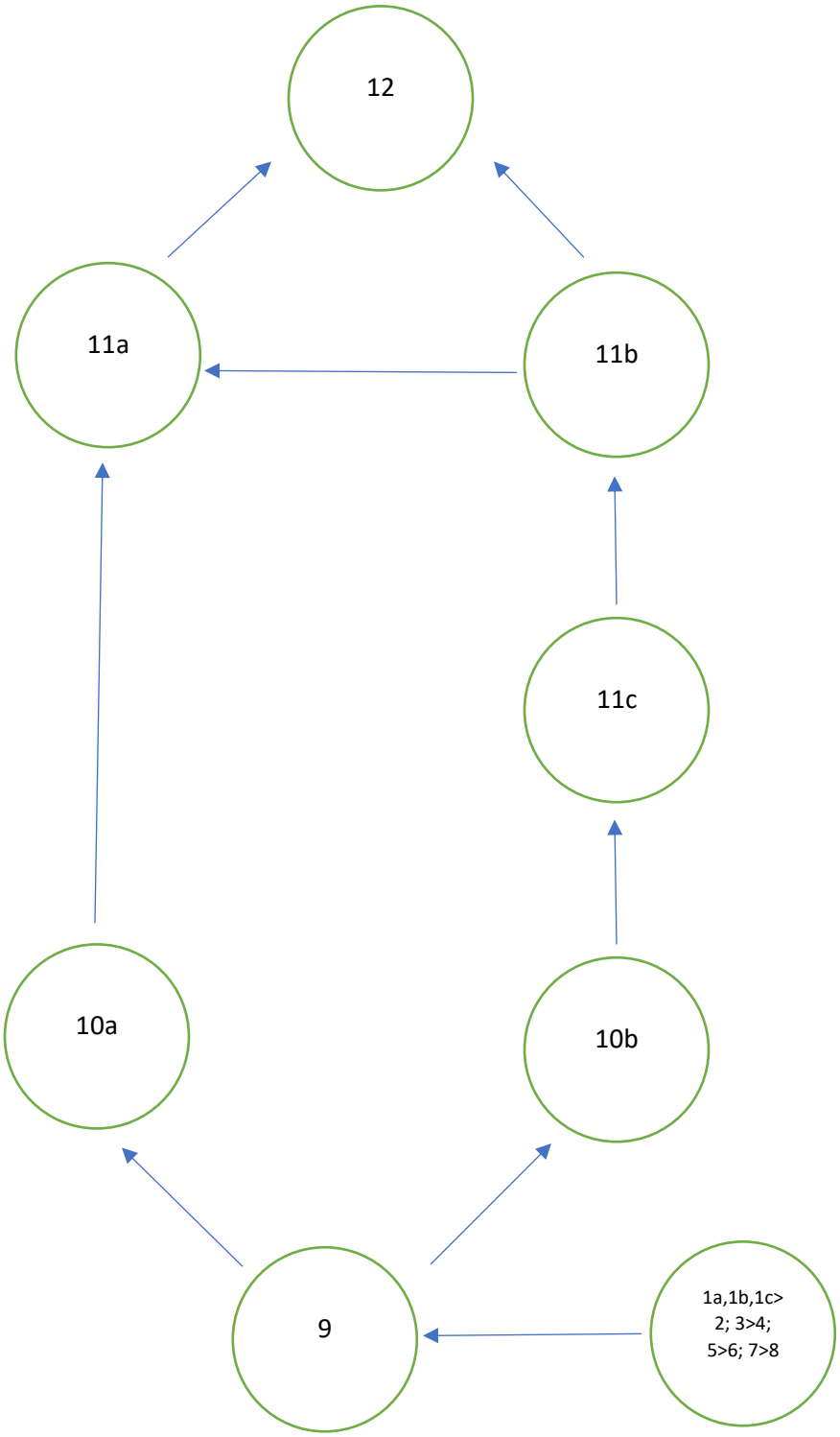
5. How well do you think you are managing the illegal wildlife trade as a govt dept? Where are you doing well? Where are the major challenges, and why?

6. Have you considered the role of culture in the illegal wildlife trade and, if so, how are you tackling it?

7. How do you think illegal trade/use of vultures should be stopped (mechanisms, enforcement, education, etc.)?

# Appendix 2

**Figure 12. Theory of Change Flow Diagram**



**Key to Fig. 12**

12. Outcome – Wildlife traders in southwest Nigeria stop selling vultures and their body parts.

11a. Outcome – Wildlife traders are convinced, committed, and intend to change.

11b. Outcome – Leaders of the Elewe-Omo promote the non-selling of vultures among their membership

11c. Outcome - Leaders of the Elewe-Omo are convinced, committed, and intend to change.

10a. Outcome - Wildlife traders attend strategic outreach programs organized by Muslim leaders

10b. Outcome - Leaders of the Elewe-Omo attend or are represented in outreach programs.

9. Outcome – Leaders of the Elewe-Omo and Wildlife traders commit to attend outreach programs

8. Outcome – Muslim opinion leader(s) communicate to Leaders of Elewe-Omo and wildlife traders to attend outreach programs based on earlier public announcements/fatwas.

7. Outcome - Muslim opinion leader(s) make public announcements and/or establish fatwas on vulture conservation.

6. Outcome - Muslim opinion leader(s) gain new knowledge on vulture conservation and their importance in the light of scriptures and agree to be ambassadors for saving vultures.

5. Outcome - Muslim opinion leader(s), policy makers, conservation managers and scientists, social scientists engage in a participatory workshop to discuss the threatened status of vultures, the impact of the trade and the scriptural basis for vulture protection.

4. Outcome - Muslim opinion leader(s) ready to commit and attend the workshop

3. Outcome – Project stakeholders invite Muslim opinion leader(s) to participatory workshop explaining the purpose and benefits of having a workshop.

2. Outcome - Muslim opinion leader(s) have a meeting with project stakeholders through a trusted third party and hears about the vulture problem based on scientific evidence and about project objectives.

1c. Outcome – Project stakeholders identify trusted party in each region that can serve as a link to the Muslim opinion leader(s) and then arrange a meeting(s).

1b. Outcome – Project stakeholders identify Muslim opinion leader(s) wildlife traders will listen to by interviewing wildlife traders in each region.

1a. Outcome - Project stakeholders have meeting(s) to develop a roadmap and assign roles and responsibilities.

## Table 10. Theory of Change Indicators

| Outcome | Indicator | Population | Threshold | Timeline | Assumption | References |
|---|---|---|---|---|---|---|
| 12. Wildlife traders in southwest Nigeria stop selling vultures and their body parts | Stopped selling vultures | Wildlife traders in southwest Nigeria | About 80% of wildlife traders in the southwest have stopped selling vultures | Within 10 years of starting the intervention | If conservationists engage with the values and motivations of the illegal wildlife traders and work within their cultural systems, it may help facilitate smooth uptake of conservation principles and therefore change behavior when wildlife traders listen to a Muslim opinion leader(s) who will promote vulture conservation. | (Welch *et al*. 1993); (Rappaport 1979, 1999); (Hmielowski *et al*. 2015); (Mcleod and Palmer 2015); (Awoyemi 2008); (Agwu 2021); (Olivier 2016); (Walker *et al*. 2019) |
| 11. Leaders of Elewe-Omo/wildlife traders are convinced, committed, and intend to change. Indicator – stated intentions | Stated intention | Wildlife traders that attend the outreach programs | At least 70% of wildlife traders make positive intentions | Data will be collected immediately after each program | Wildlife traders are motivated in general by their faith-belief and will be influenced by the messages of a Muslim opinion leader(s) | " |
| 10. Wildlife traders attend strategic outreach programs organized by Muslim leaders | Attendance | Program attendees | More than 50% of Muslim Elewe-Omo members attend the outreach programs | Duration of program | Wildlife traders believe in Muslim opinion leaders and will accept their invitation | " |
| 9. Leaders of the Elewe-Omo/Muslim wildlife traders commit to attend outreach programs | Stated intention | Leaders of Elewe-Omo and wildlife traders | At least 70% of Muslim Elewe-Omo members make intentions to attend meeting | About one week after the announcements have been made, Elewe-Omo members will be surveyed to know those who will attend and why | Leaders of Elewe-Omo and wildlife traders are regular listeners to radio and attend the mosque regularly | (BBG 2014) |
| 8. Muslim opinion leader(s) communicate to Leaders of Elewe-Omo and wildlife traders to attend outreach programs based on earlier public announcements/fatwas. | Number of invitees | Leaders of Elewe-Omo/wildlife traders | The entire Muslim Elewe-Omo membership are invited | Within 3 – 5 days to send out invitations | Elewe-Omo is an organized institution and through its leadership, the majority of the membership can be reached. | |
| 7. Muslim opinion leader(s) make public announcements and/or establish fatwas on vulture conservation | Number of public announcements and one established fatwa | Entire Elewe-Omo membership of Muslim traders and their leaders. | One public announcement everyday | Duration of about 3 weeks | Muslim opinion leaders will be interested in the topic of vulture conservation, see its relevance in the light of scriptures and therefore be willing to be | Quran (22:18); Quran (6:38) |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | ambassadors and make public announcements and/or fatwa on the vulture conservation | |
| 6. Muslim opinion leader(s) gain new knowledge on vulture conservation and their importance in the light of scriptures and agree to be ambassadors for saving vultures. | Feedback evaluation | Muslim opinion leader(s) | At least one leader consents to be an ambassador | Evaluation takes place immediately after workshop | Muslim opinion leaders will be interested in the topic of vulture conservation, see its relevance in the light of scriptures and therefore be willing to be ambassadors and make public announcements and/or fatwa on the vulture conservation | " |
| 5. Muslim opinion leader(s), policy makers, conservation managers, and scientists, social scientists engage in a participatory workshop to discuss the threatened status of vultures, the impact of the trade and the scriptural basis for vulture protection. | Attendance | Muslim opinion leader(s) and project stakeholders | At least one Muslim opinion leader is in attendance | Workshop duration within 2-3 days | Muslim opinion leaders will consent to attending the workshop | (Walker *et al.* 2019); (Olivier 2016) |
| 4. Muslim opinion leader(s) ready to commit and attend the workshop | Written confirmation by Muslim opinion leader(s) of willingness to attend | Muslim opinion leader(s) | At least one Muslim opinion leader gives written confirmation | Written response should be expected within 2 weeks of invitation | Project stakeholders have established good rapport and trust with Muslim opinion leaders during introductory meeting | " |
| 3. Project stakeholders invite Muslim opinion leader(s) to participatory workshop explaining the purpose and benefits of having a workshop | Number of invitation letters sent and safely received | Muslim opinion leader(s) | At least 80% of invitation letters are safely received by Muslim opinion leader(s) | Within 1 – 3 days of sending out invitations | Project stakeholders have established good rapport and trust with Muslim opinion leaders during introductory meeting | " |
| 2. Muslim opinion leader(s) have a meeting with project stakeholders through a trusted third party and hears about the vulture problem based on scientific evidence and about project objectives | Project stakeholders received | Muslim opinion leader(s) | At least one Muslim opinion leader has a meeting with project stakeholders | Project stakeholders are received at most 2 – 3 weeks after arranging a meeting | Trusted third party has an excellent relationship with Muslim opinion leader(s) and can help facilitate a meeting with the Muslim opinion leader(s) | |
| 1c. Project stakeholders identify trusted party in each region that can serve as a link to the Muslim opinion leader(s) and then arrange a meeting(s) | Trusted party identified, and meeting arranged | Trusted party | At least one trusted party is identified | About one month | Existing networks known by project stakeholders have or can lead to a trusted third party | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1b. Project stakeholders identify Muslim opinion leader(s) wildlife traders will listen to by interviewing wildlife traders in each region | Muslim opinion leader(s) | Muslim opinion leader(s) | At least one Muslim opinion leader is identified | At most one-month duration | There will be consistency in data collected from interviewing wildlife traders on Muslim opinion leaders they will listen to | |
| 1a. Project stakeholders have meeting(s) to develop a roadmap and assign roles and responsibilities. | Complete roadmap, assigned roles and responsibilities | Project stakeholders | Complete roadmap, assigned roles and responsibilities | 2-3 weeks | A proposal and Theory of Change are already available to inform conservation planning | |