

CULTURE AS A DETERMINANT OF
ENVIRONMENTAL PROTECTION
IN DEVELOPING NATIONS

by

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ABSTRACT

This study examines the explanatory role of culture regarding biodiversity levels in developing nations. Two hypotheses ascertaining that culture is significant in determining the health of the environment in developing countries were derived from the Inglehart-Welzer Cultural Map of the World Values Survey, and an examination of data from the Yale Environmental Performance Index. Through a mixed method approach, I use quantitative analysis to test these hypotheses and examine biodiversity trends among the least developing nations on earth. From this analysis, case studies of Burkina Faso, Ethiopia, Mali and Zambia were utilized to demonstrate culture as a determinant of biodiversity levels in each country. Both hypotheses were supported, and harbor implications for the future of environmental protection.

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INTRODUCTION

Biodiversity plays a crucial role in the perpetuation of humanity. More than merely serving as the basis for agricultural production of crops and livestock, it provides an overwhelmingly high percentage of need satisfaction for people living in poverty by being a source of food and income.¹ Simply put, the importance of biodiversity is inarguable – however, protection of the environment varies across regions, countries, and peoples. Unfortunately, the never-ending demand for natural resources has increased consumption to the detriment of biodiversity. The tension between demand for instant gratification of resource use versus the need to protect them for long-term world sustainability gives precedence to the need for understanding what determines environmental protection.² As a general rule, politically stable countries with strong economies are the most effective at protecting the environment, whereas domestic instability (political and economic) is correlated with less environmental protection.

The divide between developed and developing countries on this subject is well-documented, however variance among developing countries has not been as thoroughly researched. As previously alluded to, politics and economics play an instrumental role in determining the effectiveness of environmental preservation within countries. In general, the correlative nature of politics and economics still stand even when each country in question is still in the developing stage. Despite this trend, discrepancies between developing nations of similar economic and political backgrounds still exist. What could

¹ "Why Is It Important?" Why Is It Important? The Convention on Biological Diversity. Accessed November 1, 2014.

² Brandt, Jodi S., Eric M. Wood, Anna M. Pidgeon, Lian-Xian Han, Zhendong Fang, and Volker C. Radeloff. "Sacred Forests Are Keystone Structures for Forest Bird Conservation in Southwest China's Himalayan Mountains." *Biological Conservation*: 34-42.

account for these differences? The answer may lie within a cultural component. Existing literature provides a variety of comprehensive looks at the economic and political nature of environmental protection - yet when cultural factors such as religious beliefs and ethnic traditions are examined in regard to this topic, research is limited to a handful of case studies that have limited applicability on a global scale. Therefore, further study is necessary to determine whether or not such factors can have a decisive impact on environmental protection.

This study will examine developing countries through the lens of the three main determinants of environmental protection: economics, politics, and cultural factors. Economics and politics as independent variables in this situation have been studied extensively and their links are well established. Therefore, cultural factors will be the primary focus of this study to determine if and to what extent they play a role in this process. It is expected that in situations where countries are otherwise similar, yet have different environmental outcomes, cultural components will play a crucial role in explaining why.

THE COMPLICATED STORY OF PROTECTION

When determining whether to protect or exploit the environment, the first and most telling factor to consider is economic incentives. Whether legal or illegal, the exploitation of wild plant and animal life has long been tied to the personal benefit of environmental officials placed in charge of natural areas. For example, high consumer demand for illegal bushmeat fuels government corruption and passivity in central Africa.³

³ De Merode, Emmanuel and Guy Cowlshaw. 2006. Species protection, the changing informal economy, and the politics of access to the bushmeat trade in the Democratic Republic of Congo. *Conservation Biology* 20 (4): 1262-71.; Struhsaker, Paul J., Thomas T Struhsaker, and Kirstin S. Siex. 2005. Conserving

On the opposite end of the spectrum, when a country realizes that preservation of nature can be capitalized upon to increase profits, the “transformation of land into the commodity form” begins. However, this transformation does not have to take the form of actions of questionable legality, and it has been said that “economic growth and the natural environment are mutually compatible.” The effect is then twofold, where nations who capitalize on the environment theoretically not only protect the land, but increase their own profits as well.⁴

Without a doubt, the most pertinent example resulting from the ability to commoditize the environment is the booming tourism industry. High levels of biodiversity fuel consumer demand to travel to exotic places for the sake of outdoor recreation. The benefits of travel for this purpose apply to not only the economy through export earnings, employment and economic development, but also through raising awareness and income for the natural areas that are visited. These benefits can be seen across the world in countries in different regions such as South Africa and Costa Rica who have seen their economies boom as a result of increased levels of tourism.⁵ In short, offering the natural environment as a sight to see can have a marked effect on the economic development of a country.

However, despite the benefits, traditional forms of tourism done for such purposes can also bring on a host of problems such as resource overexploitation, wildlife disturbance, and unchecked land conversion, which can subsequently bring the economic

⁴ Sullivan, Sian. "Banking Nature? The Spectacular Financialisation of Environmental Conservation." *Antipode*: 198-217.

⁵ Kepe, T. "Tourism, Protected Areas and Development in South Africa: Views of visitors to Mkambati Nature Reserve." *South African Journal of Wildlife Research* 31 (3-4): 155-9.; Manfredo, Michael J., Tara L. Teel, and Harry Zinn. "Understanding Global Values toward Wildlife." In *Wildlife and Society: The Science of Human Dimensions*, 31. Washington, DC: Island Press, 2009. 7-8,13-15.

benefits to a screeching halt as the land becomes less desirable to visit.⁶ This has contributed to the rise of a more sustainable form of travel: ecotourism. This concept is commonly defined as “traveling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring, and enjoying the scenery and its wild plants and animals, as well as any existing cultural manifestations (both past and present) found in these areas.”⁷

The rising prominence of this concept lends credence to the idea that a country can really have the best of both worlds: economic growth and sustainability of the environment. Among developing countries, ecotourism alone produces over US \$29 billion in revenue each year. These profits not only contribute to the economic advancement of countries, but ideally also to the safeguarding of biodiversity within the country as well.⁸ These dual benefits have given rise to hopes that ecotourism can become a panacea, a beacon of hope for the possibility of humans and wildlife not only to coexist, but also to flourish. Small incidences proving the potential of this have occurred when a particularly beloved species has been tagged as the main attraction for tourism. For example, large amounts of tourists are drawn to Mozambique solely for a chance to swim with the whale sharks that survive off the coasts. Thus, protection of the whale shark is necessary for the continued revenue they bring into Mozambique. As always there is a caveat; while this may seem like a win for the country, the tourists and the

⁶ Manfredo et al. 11-13.

⁷ Krüger, Oliver. "The Role of Ecotourism in Conservation: Panacea or Pandora's Box?" *Biodiversity and Conservation*: 580

⁸ Zhou, Youbing, Christina D. Buesching, Chris Newman, Yayoi Kaneko, Zongqiang Xie, and David W. Macdonald. "Balancing the Benefits of Ecotourism and Development: The Effects of Visitor Trail-use on Mammals in a Protected Area in Rapidly Developing China." *Biological Conservation*: 18-24.

environment, such scenarios are not widespread and do not necessarily indicate higher levels of environmental protection.⁹

Unfortunately the concept of ecotourism as a panacea has yet to be realized as regional differences in environmental protection abound, even when ecotourism technically has an integral presence in a country.¹⁰ Unintended downsides of ecotourism take form in the same ways that traditional tourism has long exploited the environment, and for the same reasons: economic calculations of how to maximize costs and benefits. Therefore although the environment can be used as a commodity for profit by a developing country, as time goes on and tourism is secured environmental degradation can still occur and be ignored if the environment is still bringing about profits as a commodity.¹¹ In sum, development of the tourism/ecotourism industries in a country can serve to strengthen the economy and is correlated to greater environmental protection, despite the existence of associated costs to the environment.

However, economics alone is not enough to act as the sole explanatory factor for environmental protection; politics also plays an active role. The ability of governments to utilize regulatory powers for the purpose or detriment of the environment is instrumental. Through claiming ownership of natural habitats and the establishment of natural parks and reserves, the government can play a monopolistic role in managing the environments within their borders. Whether stimulated by economic or philanthropic motives, the government has the power to invest money and resources into conservation, or to allocate

⁹ Haskell, Peter J., Andrew McGowan, Anna Westling, Adriana Mendez-Jiménez, Christopher A. Rohner, Marcela Rosero-Casicedo, Jodi Salmond, Ara Monadjem, Andrea D. Marshall, and Simon J. Pierce. "Monitoring the Effects of Tourism on Whale Shark *Rhincodon Typus* Behavior in Mozambique." *Fauna and Flora International*: 1-8.

¹⁰ Kruger 579.

¹¹ Coburn Isaacs, Jack. "The Limited Potential of Ecotourism to Contribute to Wildlife Conservation." *Wildlife Society Bulletin* 28, no. 1, 64.

them elsewhere. In this sense, it is solely the will of the government that determines success.

However, problems arise in the realms of regulation and corruption. Although commitment and ratification of international environmental agreements should indicate a greater willingness to protect the environment, the costliness and difficulty of enforcement makes domestic implementation tricky. Local interests can further add tension to these scenarios. More opportunities for environmental exploitation further occur in areas where corruption and instability characterize the governing body. This is exemplified most acutely through the process of poaching, the popularity of which can be affected by a variety of complex interactions between the perpetrators and the government.¹²

The allure of ecotourism can provide an economic incentive for political officials to allow the exploitation and degradation of the environment. As previously mentioned, when the environment is thought of as an economic commodity, its intrinsic value is not taken into account so much as if profits are still being accumulated. At the very least, the presence of ecotourism can lead the government to make environmental concessions for the sake of satiating the demands of tourists and to continue making money. Concessions can have further impact on defining economic commodities as political reasoning and monetary rewards influence whether a forest is seen as a possibility for revenue via ecotourism or logging. Political decisions regarding environmental protection are further complicated by tensions between differing ideas of national interest, and conflicts

¹² Coburn Isaacs, Jack, and Paul C. Missios "Wildlife Trade and Endangered Species Protection." *The Australian Journal of Agricultural and Resource Economics*: 613 - 614.

between public and private interests. Again, political instability lends itself to a system that has difficulty carrying out enforcement one way or the other, which contributes to less effective environmental protection and opens the door for outside enterprises to dominate control of resources.¹³

Conflicts between national and local interests are exemplified through a case study of forest conservation in Laos. The state governance in Laos has been responsible for the majority of forest exploitation and degradation of environmental resources in their own country. The decline of resources has been felt by the impoverished rural citizens of the state, who have not failed to notice the disappearance of once plentiful plant food sources. Thus, although a demand for “conservation” in the altruistic sense of the word remains absent, outrage against the loss of environmental resources and therefore livelihoods has been widespread. This civil-state conflict highlights the third important facet of environmental protection: culture.¹⁴

The relationship between economics and politics has a great effect on the resulting state of the environment across the globe. However, these two factors alone are unable to fully explain variance in environmental practice particularly in regard to the developing world. Religious beliefs, ethnic traditions, and local history have all been touched upon as potential explanatory factors and show promise as key variables. It has been said that “every culture’s relationship with wildlife is a response to universal human needs, and across cultures, both differences and similarities exist in how these needs have

¹³ Hardin, Rebecca. "Concessionary Politics: Property, Patronage, and Political Rivalry in Central African Forest Management: With CA Comment by Serge Bahuchet." *Current Anthropology* 52, no. S3, S113-125.

¹⁴ Singh, Sarinda. "Governing Anti-conservation Sentiments: Forest Politics in Laos." *Human Ecology*: 755-57.

been met.”¹⁵ In other words, decisions about the environment are made through a synthesis of considerations regarding a wide variety of factors, including cultural. As the following two case studies will show, the inclusion of a human factor adds further complexity to the puzzle of environmental protection, but also offers greater insight.¹⁶

Deep within the Himalayan mountains of China are forests considered to be sacred due to the intrinsic cultural and religious significance they hold for the local populations. As such, they are generally managed by the communities themselves. Research shows that these areas contain higher levels of biodiversity than the surrounding state-regulated protected areas, and that these sacred forests serve as vital keystones of the surrounding environment as a whole. The irrefutable success of these areas in preserving biodiversity leads the author to conclude that sacred forests have the potential to have a greater impact on environmental success than state-sanctioned protected areas. In this instance, it is clear that the local culture of sacred forests was the deciding factor in the preservation of biodiversity in this region - but it also begs the question of whether these results could be replicated on a broader scale. Local populations have been speculated to be the “best defenders” of areas of environmental significance against threats originating from public and private sector interests. Unfortunately the specific reasoning behind why these forests were sacred and how the locals interacted with the

¹⁵ Manfredo et al, 31.

¹⁶ Kellon, Delanie, and Joseph Arvai. "Five Propositions for Improving Decision Making about the Environment in Developing Communities: Insights from the Decision Sciences." *Journal of Environmental Management*: 363-71.

area on a regular basis was glossed over. Additionally, the role of economics and politics is not made clear.¹⁷

Another, more striking example comes from the predominantly Muslim island of Misali, located in the Zanzibar region of Tanzania. At one time, the marine habitat surrounding the island was rich with biodiversity and healthy ecosystems, and it supported the marine-based economy of the island. Unfortunately, destructive fishing practices were threatened to decimate not only the marine habitats, but also the economy of the island. Foreign investors saw this as an opportunity to insert themselves, and suggested the construction of a tourist resort that could help boost the economy and provide incentives to preserve the wildlife the tourists would want to see. This proposal was wholly rejected by the Misali locals, who saw it as an encroachment upon their ability to make a living from fishing the waters. It seemed that the discussion on the preservation of the Misali marine habitats had reached an impasse - until CARE International in Tanzania joined with the Islamic Foundation for Ecology and Environmental Sciences, UK and the Zanzibar Commission for Natural Resources to invoke Islamic principles to promote the conservation of these areas. The resulting Misali Ethics Project utilized values found within the Qur'an such as respect for Allah's creation and human responsibility to care for creation to reach the Muslim majority. The effects of this approach were immediate; the number of fisherman who thought Islam related to their profession and who actively practiced conservation measures rose from 34% to 66%

¹⁷ Brandt, Jodi S., Eric M. Wood, Anna M. Pidgeon, Lian-Xian Han, Zhendong Fang, and Volker C. Radeloff. "Sacred Forests Are Keystone Structures for Forest Bird Conservation in Southwest China's Himalayan Mountains." *Biological Conservation*: 34-42.; Dove, Michael R. "Indigenous People And Environmental Politics." *Annual Review of Anthropology*: 191-208.

after this initiative was promoted. This is a striking example of the ability of religious culture to positively impact environmental preservation.¹⁸

In short, existing literature regarding the driving forces behind environmental success and the preservation of biodiversity has often been limited to examination through the scope of one particular lens - whether it be economic, political, or cultural. These scopes have provided interesting looks at specific case studies, but in general a large sense of ambiguity and disconnect between findings remains. There is a need for more data on all developing nations to bridge the gap between these disconnects.

DEFINING THE LINK BETWEEN CULTURE AND PROTECTION

As previously stated, it has long been known that politically stable and economically strong nations will have better preserved and protected environments, and politically unstable and economically weak nations will have less well preserved and protected environments. In terms of defining a more or less successful natural environment within a country, a key indicator of environmental proliferation and stability has often been biodiversity. Thus, higher or lower levels of biodiversity would indicate a more or less protected and healthy environment. While the concepts of political and economic systems are easy to define, conceptualizing culture is another matter.

Although difficult to operationalize, the World Values Survey has shed light on definitive cultural differences and definitions across the globe. This mass data collection project has resulted in the Inglehart-Welzel Cultural Map, which has defined two major dimensions of cultural variation, consisting of two value sets per dimension. Each country has a culture type that is a combination of one value set from each of the two

¹⁸ Dudley, Nigel, Liza Higgins-Zogib, and Stephanie Mansourian. "Beyond Belief: Linking Faiths and Protected Areas to Support Biodiversity Conservation". 78-81.

dimensions. They are: traditional values versus secular rational-values, and survival values versus self-expression values. "Traditional" is defined by cultures who exhibit a high degree of nationalism, and who emphasize the importance of religion, family, and tradition. Secular-rational cultures do not exhibit the traits of traditional cultures, and are very accepting of concepts such as divorce and abortion. Survival cultures are generally more ethnocentric and emphasize economic and physical security. Self-expression cultures strive for participation in decision making and are accepting of alternate lifestyles.

Most notably, self-expression cultures are more likely to place an emphasis on protecting the environment. Developing nations are more likely to exhibit survivalist values, which makes the survivalist versus self-expression dimension of utmost importance to this study. This is explained by building upon the hierarchy of human needs as put forth by Abraham Maslow, as it is known that cultures and nations who do not have their basic needs secured are less likely to be cognizant or concerned with issues past the desire to fulfill basic human needs. The presence of self-expression values and subsequently stronger environmental protection in a developing country could therefore be indicative of a strong underlying cultural influence. Here, it is important to note that although this data is highly insightful, the number of cases this study looks at is incomplete, and therefore it has limited quantitative applicability. Although the Inglehart-Welzer Cultural Map will be used to categorize and explain the case studies of this paper, it will not be used in the quantitative analysis section.

Therefore, as this paper seeks to demonstrate the importance of culture in regard to environmental protection, the hypotheses are as follows: developing states that are

politically and economically similar will still exhibit variance in their levels of environmental protection as indicated by variance in biodiversity levels, and developing nations that exhibit self-expression values will be more likely to have higher levels of environmental protection as indicated by higher biodiversity levels than those that exhibit only survivalist values.¹⁹

METHODS

To examine the role of culture type in environmental protection, I employ a mixed method approach combining a large-n analysis with select case studies to trace out the causal mechanisms at work. For the large-n portion, I collected data on the forty-eight least developed countries from 2004 - 2014. These forty-eight countries have been classified as least developed by the World Bank, and are listed in Appendix A: List of Least Developed Nations.²⁰ To operationalize the concept of environmental protection for the large-n analysis, I rely on the 2014 Environmental Performance Index (EPI) data set constructed by Yale University, which has given each country an individual score in the specific measure of “Biodiversity and Habitat.” The EPI measures this variable by examining each country’s performance on four specific variables: Critical Habitat Protection, Terrestrial Protected Areas (National Biome Weight), Terrestrial Protected Areas (Global Biome Weight), and Marine Protected Areas. After performance in each of these areas is analyzed, scores are assigned on a scale of 0 - 100, with 0 being the worst possible score and 100 being the best. Each country is also given ranked against all other countries looked at by this study. For example, a country with the 5th best

¹⁹ World Values Survey. <http://www.worldvaluessurvey.org/WVSContents.jsp>.

²⁰ “Least developed countries: UN Classification.” <http://data.worldbank.org/region/LDC>.

biodiversity score would be ranked 5; countries with the same score on the 0 - 100 scale share the same rank.²¹

The main independent variables for the large-n analysis are: income per capita, degree of income inequality, economy type, government type, corruption index, human rights score, voting history, and presence of civil conflict. These independent variables allow for each of the forty-eight countries to be categorized as most and least similar in terms of economic and political structure. For each of these measures, the most recent data available was used. Income per capita, or the gross national income divided by population, was taken from the World Bank. Income inequality is measured as the extent to which distribution of income among individuals deviates from a perfectly equal distribution, and was taken from the GINI index. Economy type was determined according to the distribution of the labor force by occupation (agriculture, industry, or services) according to the CIA World Factbook. Government type was also assigned as per classification by the CIA World Factbook. The Corruption Perceptions Index measures how corrupt the public sector of a country is perceived to be and was recorded for each country. Scores on human rights were taken from the CIRI Human Rights Dataset, which quantifies scores on fifteen internationally recognized human rights. Finally, data regarding presence of civil conflict was taken from the UCDP/PRIO Armed Conflict Dataset. To clarify - each of the aforementioned variables was studied to determine political and economic similarities and differences among the forty-eight countries of interest. They were not intended to be reflective of cultural values. Due to a shortage of usable cultural data specific to each of the forty-eight countries, preliminary

²¹ “Biodiversity and Habitat.” Environmental Performance Index. <http://epi.yale.edu/our-methods/biodiversity-and-habitat>.

cultural differences were based upon the majority religion of each country, which was also taken from the CIA World Factbook and cross-referenced by official country websites when necessary.²²

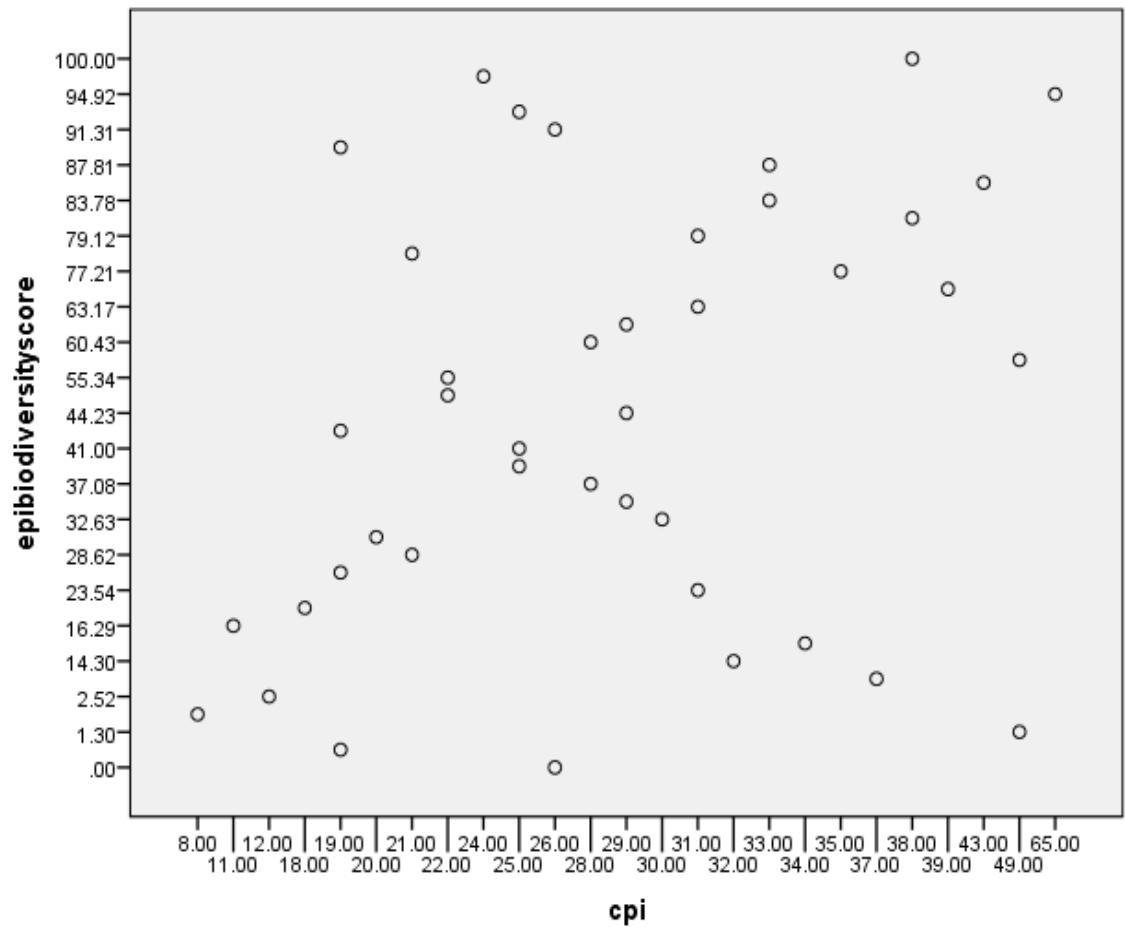
To understand this data, economic and political indicators were tested against biodiversity scores through regression analyses. The relationship between religion and biodiversity scores was measured using a comparison of means test. Case studies were then chosen to represent the most meaningful relationships demonstrated by these comparisons.

DATA

The most striking result of the statistical analysis is that none of the regression analyses yielded statistically significant results. No measureable relationship could be found between any of the independent variables and biodiversity scores. In particular, tests run with economic indicators showed that not only were economic conditions not statistically significant, but the effect they had on results were negligible at best. This can be seen in the regression analysis listed in Appendix B: Regression Analysis. The two variables that did impact biodiversity scores were: the Corruptions Perceptions Index (CPI) and religion. Although not statistically significant, the correlation between CPI and biodiversity scores yields a somewhat positive relationship. As the following graph illustrates, a general upward trend can be seen, but the frequency of outliers makes this variable invalid as a way of predicting biodiversity scores. Note that for the CPI measure

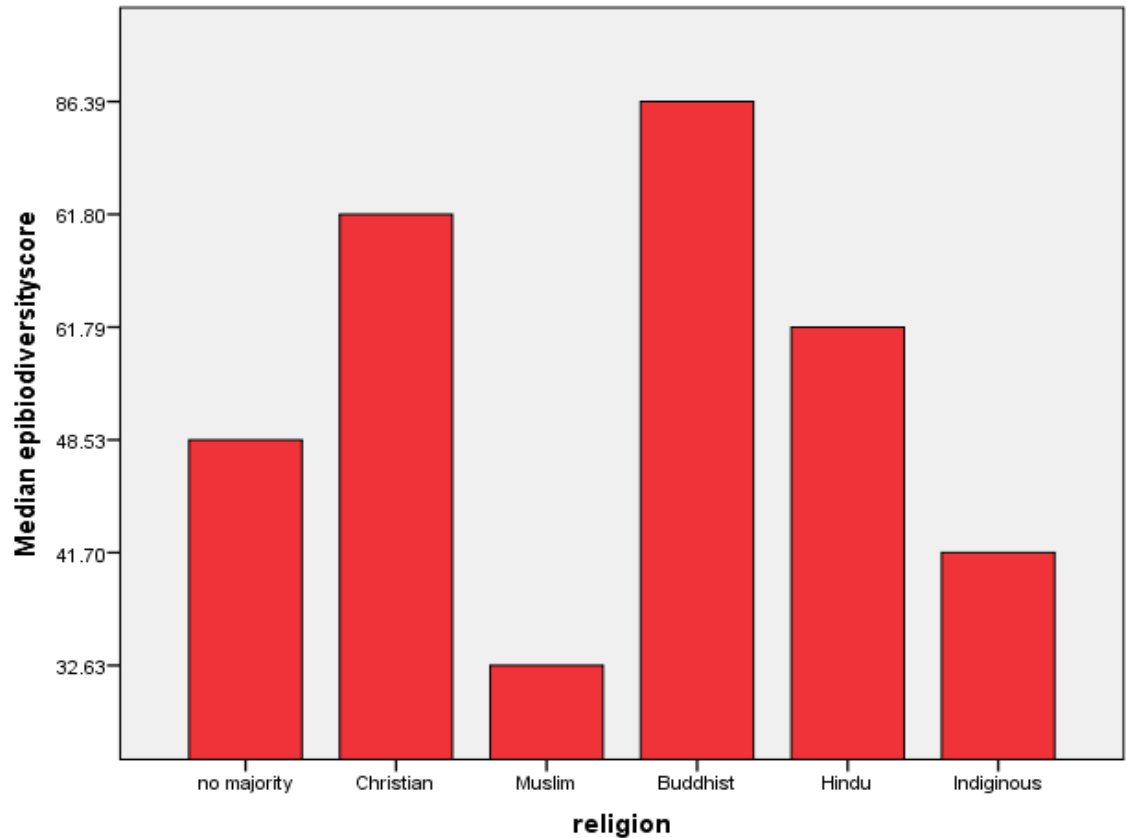
²² “Data and Documentation.” <http://www.humanrightsdata.com/p/data-documentation.html>.; “Overview.” <http://www.transparency.org/research/cpi/overview>.; “The World Factbook.” <https://www.cia.gov/library/publications/the-world-factbook/docs/profileguide.html>.; “UCDP/PRIO Armed Conflict Dataset.” http://www.pcr.uu.se/research/ucdp/datasets/ucdp_prio_armed_conflict_dataset/.

a higher score signifies a less corrupt country, and for the biodiversity scores a higher number indicates better performance:



Similarly, although the comparison of means between religion and biodiversity scores cannot be considered statistically significant, it is nonetheless a fascinating snapshot of the potential explanatory factor of this variable. When examining the graph, states who are predominantly Buddhist can be seen to have the highest average biodiversity score. Unfortunately, this result is from a sample size of only two. Thus, it is more interesting to note the difference between Christian and Muslim nations, which had a sample size of seventeen and eighteen respectively. There is a clear disparity between

the two, as Christian nations can be seen as having an average biodiversity score of 61.80, while Muslim nations have an average biodiversity score of 32.63. The graph is as follows:



Overall, this data serves to discredit existing literature that points to political and economic conditions as most important in determining environmental protection. In contrast, this data seems to suggest that when looking at the differences between one particular economic cluster, such minor differences are less important. It can be extrapolated from this data that therefore, when looking at a particular economic cluster of countries, differences in biodiversity can be better explained when looked at through a cultural lens.

CASE STUDIES

From the data, the following case studies were chosen: Burkina Faso, Ethiopia, Mali, and Zambia. These cases were chosen because they are included in the World Values Survey, which will allow for deeper insight on cultural factors. Furthermore, they are very comparable economically and politically, but vary in regard to religion and biodiversity scores. The country comparisons are as follows:

Country	CIRI	Economy Type	Religion	Biodiversity Score	Biodiversity Rank
Burkina Faso	38	Service	Muslim	83.75	42
Ethiopia	33	Agriculture	Christian	83.78	41
Mali	32	Agriculture	Muslim	14.3	159
Zambia	38	Service	Christian	100	1

Additionally, each of these cases are located in sub-Saharan Africa, have republican governments, and comparable levels of GINI income inequality and GNI/capita, with the exception of Zambia which has slightly higher levels of each. Two things are immediately noteworthy about these cases: Zambia has perfect biodiversity scores while Mali is among the worst of the worst. Meanwhile, Ethiopia and Burkina Faso are towards the top of the middle of the pack. Although they are all developing countries, and on paper share many similarities economically and politically, they have very different environmental outcomes. A more detailed look at the cultural heritage and possible explanatory factors for each case is therefore necessary.

Burkina Faso

A landlocked nation of 16.93 million people nestled in West Africa, Burkina Faso was a region of high economic importance for the Songhai Empire during the 15th and

16th centuries. It later became the Kingdom of Ouagadougou before being conquered by the French towards the end of the 19th century. Originally administered as part of the Cote d'Ivoire territory, it was separated into its own colony in 1919. After a struggle for independence, the country was liberated in 1960 and today is a parliamentary republic. The landscape of Burkina Faso consists of both savannas and scattered forests, and there is much variety in native bird and insect species. The Burkinabe culture has strong ties to music, art, and folkloric traditions. While the majority of the population is Muslim, there is a sizable Christian minority. Both of these religious groups incorporate elements of traditional animist practices into their religious traditions.²³ According to the World Values Survey (WVS), 82.8% of Burkinabe people consider religion to be very important to their lives, and an additional 12% consider it to be important. Additionally, 71.2% consider "loss of plant or animal species or biodiversity" to be a very serious problem, and an additional 17.9% consider the problem somewhat serious. Finally, when asked how well they identify with someone who finds the environment and caring for nature important, 75.8% considered that to be "very much like me," "like me," or "somewhat like me."²⁴

Calling to mind Burkina Faso's respectable biodiversity score of 83.75/100 and rank 42/178, the cultural reasons why the Burkinabe people may care about the environment are important to note. The WVS data regarding the environment lends credence to the assertion that self-expression values are somewhat commonly found in Burkina Faso. Recall that self-expression values, less prominent in developing nations,

²³ Echenberg, Myron. "Burkina Faso | History – Geography." Encyclopedia Britannica Online. Accessed April 4, 2015. <<http://www.britannica.com/EBchecked/topic/85420/Burkina-Faso>>.

²⁴ World Values Survey.

are often correlated with higher levels of environmental protection, particularly when compared to survivalist values. To better understand how self-expression values may have woven their way into the culture of Burkina Faso, and how these values have shaped the face of environmental protection in the country, it is necessary to understand one man: Thomas Sankara.

In the initial post-independence period, leadership in Burkina Faso was determined by military coups. On August 4, 1983 yet another coup resulted in the placement of Captain Thomas Sankara as head of state. Although popular support for his rule declined until his overthrow and assassination in 1987, his legacy has remembered him as the “pure president” of Burkina Faso and he continues to be highly revered and celebrated in the country. Sankara enacted countless reforms for the betterment of his country and promoted self-expression values such as transparency of government funds to encourage public participation.²⁵ Furthermore, he enacted environmental reforms that promoted not a survivalist relationship with the land, where it is needed only to offer sustenance and a living for those who live upon it, but rather a harmonious relationship that promoted sustainability. As stated by Sankara at the 1986 SILVA Conference on Forestry and Trees: “My intentions is to tell you in the most explicit way, of profound changes taking place in Burkina Faso in the relationships between man and tree. My intention is to testify to you in the most truthful way of the birth and the development of a

²⁵ Ray, Carina. “Thomas Sankara.” Encyclopedia Britannica Online. Accessed April 4, 2015. <http://www.britannica.com/EBchecked/topic/522527/Thomas-Sankara>; Duval Smith, Alex. “Africa's Che Guevara’: Thomas Sankara's Legacy - BBC News.” BBC News. April 30, 2014. Accessed April 4, 2015. <http://www.bbc.com/news/world-africa-27219307>.

sincere and profound love between the Burkinabe man and the environment, and therefore between the Burkinabe man and life.” These environmentally conscious objectives continue to be reflected in the *Terres Vivantes - Thomas Sankara* (“Living Land - Thomas Sankara”), an association which seeks to perpetuate the environmental objectives of the late Burkinabe leader.²⁶

It is clear that the WVS data and the Burkinabe values instilled and exemplified by Thomas Sankara indicate that there is at least a base level of self-expression support for the environment as a realm that deserves protection in Burkina Faso. This is not to say that biodiversity in Burkina Faso is completely safe - it is estimated that the country loses 32,000 hectares of forest each year to provide fuel and trade commodities. Furthermore, overpopulation and soil erosion are also taking a toll on the central plateau of Burkina Faso. However, despite these problems, life continues to flourish and within the country’s twelve Wildlife Conservation Units and four national parks, over 2,000 plant and animal species survive. Most notably, the wild lands of Burkina Faso are one of the few remaining habitats that house critically endangered Saharan cheetahs.²⁷ Thus, although Burkina Faso exhibits the type of environmental decline expected of a nation still in the development process, it nevertheless remains a hotbed for crucial biodiversity. Given the state’s low economic standing, it is entirely possible that the self-expression values demonstrated by the citizens polled by the WVS and mainstreamed by Thomas Sankara play a role in the promotion and preservation of this biodiversity.

²⁶ Oudet, Maurice. “Quel est l’héritage de Thomas Sankara sur les questions de l’écologie et de l’environnement.” 15 Oct 2012. <http://www.thomassankara.net/spip.php?article1383&lang=fr>.

²⁷ “Burkina Faso.” African Wildlife Foundation. <http://www.awf.org/country/burkina-faso>.

Ethiopia

Not only is Ethiopia the oldest independent country in Africa, it also was largely immune to the colonization period. Despite being occupied by Benito Mussolini's troops for five years, the country was never truly colonized and as such, it served as a symbol of African tenacity and independence. One of the founding members of the United Nations, Ethiopia became a republic after the overthrow of the last monarch in 1974. Today, the Ethiopian economy is considered fast-growing in comparison to other non-oil exporting African countries, and is highly dependent upon agricultural commodities such as coffee. Ethiopia boasts high amounts of biome diversity, but due to declining numbers up to 5% of the country has been set aside as protected areas.²⁸ Additionally, Ethiopia's EPI scores are comparable to Burkina Faso. Ranking just above the latter at 41/178, Ethiopia's score is 83.78/100. What makes these results particularly striking is that Ethiopia struggles with other measures addressed by EPI such as water resources, water sanitation, and health. Even more striking, Ethiopia's overall EPI score is only 39.43/100 - significantly lower than what was scored on biodiversity.²⁹ Therefore, although this state clearly struggles with environmental health concerns, they shine in regard to biodiversity. The reason for this may lay with the unique cultural heritage of Ethiopia.

Ethiopian culture is strongly tied to the Ethiopian Orthodox Church (EOC), one of the oldest Christian churches in the world. The majority of old historic sites in Ethiopia are linked to the church, and physical cultural artifacts are seen as less important to cultural heritage than the perpetuation of shared cultural ideals. These "idealistic ethos"

²⁸ Mehretu, Carina. "Ethiopia." Encyclopedia Britannica Online. Accessed April 4, 2015. <http://www.britannica.com/EBchecked/topic/194084/Ethiopia>.

²⁹ World Values Survey.

revere wisdom and respect for the sanctity of human life.³⁰ As the majority religion of Ethiopia, the impact this church has on its citizens is inarguable - particularly when combined with the WVS finding that 93.6% of Ethiopians consider religion to be “very important” or “rather important.” Therefore it is also necessary to take a look at the church’s unique relationship with the environment to better understand how Ethiopian culture may account for their ability to retain a high biodiversity score.

Among a particular sect of the EOC is the Tewahedo Church, whose structures are surrounded by forests which are deemed sacred. Each church compound consists of a physical church, a cleared space for prayer, and an expansive forest area. What’s more, it has been found that these forest areas associated with the EOC retain much higher levels of biodiversity than other areas of Ethiopia. In fact, within the particular compound led by Tsellamo Mikael, researchers have gone so far to say that “wild animals inhabiting in Church forests are living in harmony with people.” This assertion is buttressed by observations of hyenas living and moving freely through the church compound without any reports of conflict between them and humans and a church member’s quote that “it is possible to see hyenas even in the daytime and they are also peaceful due to the grace of God.”³¹ These anecdotes may present an idealized version of events, but the facts nonetheless remain that these church forests are doing wonders for biodiversity. In fact, the stands of trees comprising the church forests comprise all that remains of once huge swaths of Ethiopian forest canopies. The priests and followers of this Christian sect believe that plant and animal life should be preserved on the basis of God’s law.

³⁰ “Ethiopian Orthodox Tewahedo Church.” Encyclopedia Britannica Online. Accessed April 4, 2015. <http://www.britannica.com/EBchecked/topic/194189/Ethiopian-Orthodox-Tewahedo-Church>.

³¹ Zesu, Gebrehiwot Gebresslassie Zesu. “The Sacred and the Profane - Environmental Anthropology of Ethiopian Orthodox Christianity.” 37.

Scientist Margaret Lowman has referred to this nexus of religion and conservation by stating: “We have the same mission. They call it God’s creatures and we call it biodiversity, but we’re all trying to conserve it.”³² A large majority of Ethiopians believe the environment is important; 69.7% of Ethiopians consider valuing the importance of looking after the environment to be “very much like me,” “like me,” or “somewhat like me.” Although this percentage is lower than what was found in Burkina Faso, it still correlates well to the values instilled by the EOC. In short, it is a reasonable assumption to draw the connection between Ethiopian culture, in particular the self-expressive cultural values disseminated by the EOC, and the subsequently high levels of biodiversity observed by researchers and church members, and confirmed by the EPI measure.

Mali

Formerly a core empire of ancient Africa, Mali was colonized by the French in the mid-19th century. Regarded a beacon of African democracy after gaining independence in 1960, Mali experienced a collapse in stability after a military coup in 2012 led to more French intervention against Islamic fighters in the region. With an economy highly dependent on raw exports such as gold and cotton, Mali is now one of the poorest countries in the world. Located directly west of Burkina Faso, there are two main vegetative and climatic regions in Mali, but they both suffer from deforestation, drought, and overgrazing which has exacerbated the severity of otherwise natural desertification. Unlike other countries known for particularly iconic species, plants like

³² Gili, Enrique. “Are church forests key to conservation in Ethiopia?” January 21, 2014. Accessed April 4, 2015. <http://www.dw.de/are-church-forests-key-to-conservation-in-ethiopia/a-17375810>.

shrubs and thorny grasses are more common.³³ Mali's dismal outlook is reflected by the EPI findings: the state ranks 159/178 in biodiversity and received a bleak score of 14.3/100. In terms of overall scores, the findings are equally disheartening as Mali is ranked 177/178 and scored an 18.43/100.³⁴

The religious culture of Mali is at surface level similar to those it shares a border with, including Burkina Faso. The majority religion of the state is Islam, and Malian culture has historically held intrinsic ties with Islam. According to the WVS 2005-2009 wave, 88.1% of Malians consider religion to be "very important" to them, and an additional 8.4% consider it to be "rather important."³⁵ However, since 2012, the country has been ruled by Islamist groups who enforce a strict interpretation of the Qur'an, and are responsible for the destruction of historical monuments as well as violence and persecution in the region. A temporary civilian rule was won in 2013, but violence and fighting quickly resumed. Like other nations experiencing internal conflict, daily life in Mali is categorized by uncertainty, instability, and fear. Racial conflicts between Arab and African residents, food and resource shortages, a sluggish economy, inflation, and displacements have all contributed to a population that has to look out for themselves and their families over all else.³⁶ The abject food and health security crises faced by Malian citizens, combined with pessimistic outlooks on the future make it clear that Mali is a survivalist culture. In the wake of the chaos surrounding their lives, the people of Mali simply have no room to exhibit the stewardship associated with self-expression values.

³³ Imperato MD, Pascal James. "Mali." Encyclopedia Britannica Online. Accessed April 4, 2015. <http://www.britannica.com/EBchecked/topic/360071/Mali>.

³⁴ EPI.

³⁵ World Values Survey.

³⁶ "Mali Country Profile." BBC News. April 30, 2015. Accessed April 30, 2015. <http://www.bbc.com/news/world-africa-13881370>.

This almost certainly has contributed to the precipitous decline of the environment and biodiversity within this state. Although 71.2% of Malians believe loss of plant or animal species or biodiversity is a “very serious” problem and 78.6% consider themselves to be someone who thinks looking after the environment is important, it can easily be argued that the only reason Malians might feel this way is because they are witnessing the decay of the environment in their state, and not that they necessarily have the drive or means to address the issue.³⁷ In the case of Mali, although comparable on paper to other sub-Saharan African states, the reality of everyday life for the Malian people is simply too unstable to allow room for environmental protection to take precedence.

However, the lack of widespread environmental protection in Mali does not mean that the country has no instances of preservation to lay claim to. The Dogon tribe, which resides in central Mali, considers crocodiles to be sacred and as such, they are allowed to live near the villages and are even fed by inhabitants. Seen as good entities, ancient creatures, and sources of good luck, life with the crocodiles is embraced and encouraged. Having a symbiotic existence with one of nature’s most fearsome creatures is striking – particularly within a country with such limited food security that the abundant crocodile population could easily be exploited for nourishment. Instead, the Dogon people choose to preserve their cultural heritage by preserving the crocodiles. Although this small example does not register on the overall biodiversity outlook for Mali, it does nonetheless hint at the future possibility to utilize such sentiments for more widespread protection.³⁸

³⁷ World Values Survey.

³⁸ Dudley, Nigel et al. 30.; Hammer, Joshua. "Hiking Deep Into Dogon Country in Mali." The New York Times. The New York Times, 06 Mar. 2010. Web. 23 Apr. 2015.

Zambia

Similar to many other African nations, Zambia was colonized in the 19th century and peacefully received independence from the United Kingdom in 1964. Despite social problems such as widespread poverty, HIV/AIDS, and one of the world's lowest life expectancy rates, Zambia has upheld a reputation for being one of the more stable and peaceful democracies of Africa. The economy of this state is highly dependent upon export, and of copper in particular. Of late, China has become heavily invested in Zambia's economy, which has been met with its fair share of support and criticism. In terms of the environment, around one third of Zambia is set aside as national parks and game areas. Iconic species such as baobab trees and elephants survive in the habitats of this state, and the iconic Victoria Falls region is a UNESCO World Heritage site.³⁹ What is most striking is the comparison of Zambia's overall and biodiversity EPI scores. In overall scores, Zambia is ranked in the same ballpark as the other case studies. Like the others, Zambia has low marks in water resources, water sanitation, and health impacts and was ranked 121/178 overall and received an overall score of 41.72/100. In stark contrast is Zambia's receipt of a perfect 100/100 for biodiversity; it shares the rank of 1 with a small handful of other high-achieving countries such as Switzerland and Luxembourg.⁴⁰ Why is this? Although economically, Zambia has a comparatively higher income level than other developing nations in Africa, it is still plagued by health and sanitation concerns, income inequality, and poverty. Zambia's overall scores are crucial in discounting economics as the sole factor to account for their high biodiversity score - if

³⁹ Hobson, Richard Hamilton. "Zambia." Encyclopedia Britannica Online. Accessed April 4, 2015. <http://www.britannica.com/EBchecked/topic/655568/Zambia>.

⁴⁰ EPI

the economy was truly a tipping point that would be reflected in better scores overall. Interestingly enough, 66.3% of Zambians identify with a person who cares for nature and the environment as “very much like me,” “like me,” or “somewhat like me,” but only 56.4% see loss of plant or animal species or biodiversity as a “very serious” or “somewhat serious” problem. This is substantially lower than reported percentages for the previous cases. Potentially, just as a large majority of Malians see biodiversity loss as a problem because it is happening before their eyes every day, Zambians may be less likely to feel the same way because their country preserves biodiversity so well, that it does not seem like an issue to them. Either way, these statistics leave room for the possible explanatory role of culture in this case.

The culture of Zambia has been shaped by foreign influences through colonization and urbanization, but traditional communal values are still respected. Likewise, the religious practices of the Christian majority in this state have been heavily influenced by traditional belief systems, and 91.9% of Zambians consider religion to be “very important” or “rather important”.⁴¹ The communal aspect of religious and cultural traditions in Zambia is most important to note, particularly when matched with the Zambian Convention on Biological Diversity. With a mission focused on biological conservation, the guiding principles of this convention invoke the communal heritage and responsibility of Zambians. The guiding principles are:

Protection, conservation and sustainable utilization of biodiversity are a responsibility of every citizen of Zambia; All Zambians depend on biodiversity, should share responsibility for managing biological resources sustainably, and should benefit equitably from the use of biodiversity; All Zambians should be encouraged to participate in decisions involving the use of our biophysical resources, including air, water, land, plants

⁴¹ Hobson.; World Values Survey.

and animals.⁴²

In addition to invoking traditional communal values, these guiding principles are also in line with self-expression values emphasizing not only caring for the environment, but also encouraging public participation in discourse. There is perhaps no better example of the use of communal values to preserve biodiversity in Zambia than the 2013 opening of the Macheje Fishing Lodge, a tourist destination located near Victoria Falls that is meant to enhance conservation efforts in the area. What is most unique about this undertaking is that it is a community-owned enterprise, born of cooperation between a private tourism company and the Sekute Chiefdom, who further agreed to set aside 20,000 hectares of land for conservation. This enterprise has been hailed as win-win strategy for both local revenue development through tourism as well as biodiversity conservation.⁴³ In this specific instance, it is clear that cultural community values were able to be invoked in order to attain gains in conservation. What makes this case more likely to be exemplary of self-expression values is not just the environmental aspect; the promotion of tourism is also in line with the self-expressive values that embrace the presence of foreigners. Furthermore, the communal nature of Macheje is also reflective of the self-expression values that encourage group participation in decision making.

In conclusion, efforts promoting biodiversity in Zambia often invoke the traditional communal values of this country. Although there is no one clear explanatory

⁴² "National Biodiversity Strategy and Action Plan." Convention on Biological Diversity. Accessed April 30, 2015. <http://www.biodiv.be/zambia/implementation/legislation/national-strategies-plans-related-environment-and/fo1407697>.

⁴³ African Wildlife Foundation Celebrates Opening of Community-Owned Conservation Lodge in Zambia." African Wildlife Foundation. August 13, 2013. Accessed May 4, 2015. <http://www.awf.org/news/african-wildlife-foundation-celebrates-opening-community-owned-conservation-lodge-zambia>.

factor that accounts for Zambia's perfect biodiversity score, it is nonetheless interesting to see how these communal attributes have interacted with conservation efforts to preserve Zambian biodiversity.

CONCLUSIONS

The raw data studied by this project uncovered clear trends that associated religion with differing biodiversity outcomes. These trends prove correct the first hypothesis, that otherwise economically and politically similar countries will still exhibit considerable variance in biodiversity scores. When this initial finding was extrapolated and researched among the four case studies, enough evidence has been found to conclude that in the case of Burkina Faso, Ethiopia, and Zambia, there is an observable cultural impact on biodiversity preservation in those countries. In Mali, the extremity of its political instability takes precedence over any efforts to engage in biodiversity preservation. These findings lend credence to the second hypothesis that countries who exhibit self-expression values will be more likely to have higher levels of environmental protection as indicated by higher biodiversity levels than those that exhibit only survivalist values. Burkina Faso, Ethiopia, and Zambia all exhibit observable cases of self-expression values while also boasting high biodiversity scores. In contrast, the country with the lowest biodiversity score, Mali, expresses only survivalist values.

Moving past simply proving the hypotheses, the implications of this study on the future of environmental protection are vast. More than just a religious label, or a celebrity figure, what this study shows is that the culture of a society can indeed be invoked to result in environmental protection. There is not one culture that is better than another when it comes to environmental altruism. Rather, it is how that culture is used to justify

or not the protection of the environment and the preservation of biodiversity. For strong performing countries such as Zambia, Burkina Faso, and Ethiopia, this study affirms and encourages their practices. For weaker countries such as Mali, this study offers hope that environmental degradation does not have to remain as the status quo, and that as more basic societal needs are satisfied, the society will be able to rally behind cultural beliefs to promote the restoration of their homeland. The future of environmental protection and the preservation of biodiversity for the sake of the planet and generations to come will not be determined by a correlation or statistic – it will be determined by people, and how we choose to act upon our cultural values to enact change.

APPENDIX A: LIST OF LEAST DEVELOPED NATIONS

Country	EPI Biodiversity Score	EPI Biodiversity Rank
Afghanistan	2.52	169
Angola	41.7	118
Bangladesh	39.68	123
Benin	65.88	80
Bhutan	94.92	17
Burkina Faso	83.75	42
Burundi	30.29	137
Cambodia	78.93	54
Central African Republic	97	14
Chad	55.34	104
Comoros	0	177
Democratic Republic of the Congo	44.85	112
Djibouti	15.45	158
Equatorial Guinea	91.32	30
Eritrea	17.94	152
Ethiopia	83.78	41
The Gambia	37.05	129
Guinea	41	122
Guinea-Bissau	89.87	32
Haiti	1.09	175
Kiribati	100	1
Lao PDR	93.85	20
Lesotho	1.3	174
Liberia	4.13	167
Madagascar	37.08	127
Malawi	87.81	36
Mali	14.3	159
Mauritania	32.63	132
Mozambique	63.17	88
Myanmar	28.62	140
Nepal	61.79	92
Niger	77.21	56
Rwanda	56.32	102
Sao Tome and Principe	n/a	n/a

Senegal	85.36	39
Sierra Leone	23.54	148
Solomon Islands	17.58	155
Somalia	1.75	172
South Sudan	n/a	n/a
Sudan	16.29	156
Tanzania	79.12	53
Timor-Leste	60.43	94
Togo	44.23	113
Tuvalu	n/a	n/a
Uganda	91.31	31
Vanuatu	27.46	142
Yemen	23.59	147
Zambia	100	1

APPENDIX B: REGRESSION ANALYSIS

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	49.682	7.570		6.563	.000
	gnipercapita	.001	.005	.028	.172	.864
2	(Constant)	46.984	14.437		3.254	.002
	gnipercapita	.001	.006	.027	.165	.870
	ciriempinx	.389	1.764	.037	.221	.827
3	(Constant)	26.061	17.885		1.457	.154
	gnipercapita	.001	.005	.019	.116	.908
	ciriempinx	-.620	1.789	-.059	-.347	.731
	cpi	.964	.515	.316	1.871	.070
4	(Constant)	46.214	27.299		1.693	.100
	gnipercapita	-.001	.006	-.019	-.116	.909
	ciriempinx	-.550	1.792	-.052	-.307	.761
	cpi	1.005	.517	.330	1.943	.060
	totaltreaties	-4.031	4.124	-.163	-.978	.335
5	(Constant)	44.308	27.272		1.625	.114
	gnipercapita	-.001	.006	-.028	-.168	.867
	ciriempinx	-.158	1.822	-.015	-.087	.931
	cpi	.833	.539	.273	1.547	.131
	totaltreaties	-2.113	4.467	-.085	-.473	.639
	Muslim or not	-12.925	11.771	-.201	-1.098	.280

a. Dependent Variable: epibiodiversityscore

REFERENCES

- African Wildlife Foundation Celebrates Opening of Community-Owned Conservation Lodge in Zambia." African Wildlife Foundation. August 13, 2013. Accessed May 4, 2015. <http://www.awf.org/news/african-wildlife-foundation-celebrates-opening-community-owned-conservation-lodge-zambia>.
- "Biodiversity and Habitat." <http://epi.yale.edu/our-methods/biodiversity-and-habitat>.
- Brandt, Jodi S., Eric M. Wood, Anna M. Pidgeon, Lian-Xian Han, Zhendong Fang, and Volker C. Radeloff. "Sacred Forests Are Keystone Structures for Forest Bird Conservation in Southwest China's Himalayan Mountains." *Biological Conservation*: 34-42.
- Brandt, Jodi S., Eric M. Wood, Anna M. Pidgeon, Lian-Xian Han, Zhendong Fang, and Volker C. Radeloff. "Sacred Forests Are Keystone Structures for Forest Bird Conservation in Southwest China's Himalayan Mountains." *Biological Conservation*: 34-42.; Dove, Michael R. "Indigenous People And Environmental Politics." *Annual Review of Anthropology*: 191-208.
- "Burkina Faso." African Wildlife Foundation. <http://www.awf.org/country/burkina-faso>.
- Coburn Isaacs, Jack, and Paul C. Missios "Wildlife Trade and Endangered Species Protection." *The Australian Journal of Agricultural and Resource Economics*: 613 - 614.
- Coburn Isaacs, Jack. "The Limited Potential of Ecotourism to Contribute to Wildlife Conservation." *Wildlife Society Bulletin* 28, no. 1, 64.
- "Data and Documentation." <http://www.humanrightsdata.com/p/data-documentation.html>.
- De Merode, Emmanuel and Guy Cowlshaw. 2006. Species protection, the changing informal economy, and the politics of access to the bushmeat trade in the Democratic Republic of Congo. *Conservation Biology* 20 (4): 1262-71.
- Dudley, Nigel et al. 30.; Hammer, Joshua. "Hiking Deep Into Dogon Country in Mali." *The New York Times*. The New York Times, 06 Mar. 2010. Web. 23 Apr. 2015.
- Dudley, Nigel, Liza Higgins-Zogib, and Stephanie Mansourian. "Beyond Belief: Linking Faiths and Protected Areas to Support Biodiversity Conservation". 78-81.
- Duval Smith, Alex. "'Africa's Che Guevara': Thomas Sankara's Legacy - BBC News." *BBC News*. April 30, 2014. Accessed April 4, 2015. <http://www.bbc.com/news/world-africa-27219307>.

Echenberg, Myron. "Burkina Faso | History – Geography." Encyclopedia Britannica Online. Accessed April 4, 2015.
<http://www.britannica.com/EBchecked/topic/85420/Burkina-Faso>.

"Ethiopian Orthodox Tewahedo Church." Encyclopedia Britannica Online. Accessed April 4, 2015. <http://www.britannica.com/EBchecked/topic/194189/Ethiopian-Orthodox-Tewahedo-Church>.

Gili, Enrique. "Are church forests key to conservation in Ethiopia?" January 21, 2014. Accessed April 4, 2015. <http://www.dw.de/are-church-forests-key-to-conservation-in-ethiopia/a-17375810>.

Hardin, Rebecca. "Concessionary Politics: Property, Patronage, and Political Rivalry in Central African Forest Management: With CA Comment by Serge Bahuchet." *Current Anthropology* 52, no. S3, S113-125.

Haskell, Peter J., Andrew McGowan, Anna Westling, Adriana Mendez-Jiménez, Christopher A. Rohner, Marcela Rosero-Casicedo, Jodi Salmond, Ara Monadjem, Andrea D. Marshall, and Simon J. Pierce. "Monitoring the Effects of Tourism on Whale Shark *Rhincodon Typus* Behavior in Mozambique." *Fauna and Flora International*: 1-8.

Hobson, Richard Hamilton. "Zambia." Encyclopedia Britannica Online. Accessed April 4, 2015. <http://www.britannica.com/EBchecked/topic/655568/Zambia>.

Imperato MD, Pascal James. "Mali." Encyclopedia Britannica Online. Accessed April 4, 2015. <http://www.britannica.com/EBchecked/topic/360071/Mali>.

Kellon, Delanie, and Joseph Arvai. "Five Propositions for Improving Decision Making about the Environment in Developing Communities: Insights from the Decision Sciences." *Journal of Environmental Management*: 363-71.

Kepe, T. "Tourism, Protected Areas and Development in South Africa: Views of visitors to Mkambati Nature Reserve." *South African Journal of Wildlife Research* 31 (3-4): 155-9.

Krüger, Oliver. "The Role of Ecotourism in Conservation: Panacea or Pandora's Box?" *Biodiversity and Conservation*: 580

"Least developed countries: UN Classification." <http://data.worldbank.org/region/LDC>.

Manfredo, Michael J., Tara L. Teel, and Harry Zinn. "Understanding Global Values toward Wildlife." In *Wildlife and Society: The Science of Human Dimensions*, 31. Washington, DC: Island Press, 2009. 7-8,13-15.

"Mali Country Profile." BBC News. April 30, 2015. Accessed April 30, 2015.
<http://www.bbc.com/news/world-africa-13881370>.

Mehretu, Carina. "Ethiopia." Encyclopedia Britannica Online. Accessed April 4, 2015. <http://www.britannica.com/EBchecked/topic/194084/Ethiopia>.

"National Biodiversity Strategy and Action Plan." Convention on Biological Diversity. Accessed April 30, 2015. <http://www.biodiv.be/zambia/implementation/legislation/national-strategies-plans-related-environment-and/fol407697>.

Oudet, Maurice. "Quel est l'héritage de Thomas Sankara sur les questions de l'écologie et de l'environnement." 15 Oct 2012. <http://www.thomassankara.net/spip.php?article1383&lang=fr>.

"Overview." <http://www.transparency.org/research/cpi/overview>.

Ray, Carina. "Thomas Sankara." Encyclopedia Britannica Online. Accessed April 4, 2015. <http://www.britannica.com/EBchecked/topic/522527/Thomas-Sankara>.

Singh, Sarinda. "Governing Anti-conservation Sentiments: Forest Politics in Laos." *Human Ecology*: 755-57.

Struhsaker, Paul J., Thomas T Struhsaker, and Kirstin S. Siex. 2005. Conserving Africa's rain forests: Problems in protected areas and possible solutions. *Biological Conservation* 123 (1): 45-54

Sullivan, Sian. "Banking Nature? The Spectacular Financialisation of Environmental Conservation." *Antipode*: 198-217.

"UCDP/PRIO Armed Conflict Dataset." http://www.pcr.uu.se/research/ucdp/datasets/ucdp_prio_armed_conflict_dataset/.

"Why Is It Important?" Why Is It Important? The Convention on Biological Diversity. Accessed November 1, 2014.

"The World Factbook." <https://www.cia.gov/library/publications/the-world-factbook/docs/profileguide.html>.

World Values Survey. <http://www.worldvaluessurvey.org/WVSContents.jsp>.

Zesu, Gebrehiwot Gebreslassie Zesu. "The Sacred and the Profane - Environmental Anthropology of Ethiopian Orthodox Christianity." 37.

Zhou, Youbing, Christina D. Buesching, Chris Newman, Yayoi Kaneko, Zongqiang Xie, and David W. Macdonald. "Balancing the Benefits of Ecotourism and Development: The Effects of Visitor Trail-use on Mammals in a Protected Area in Rapidly Developing China." *Biological Conservation*: 18-24.