

CAN RELIGIOUS AFFILIATION INTERFERE WITH PERCEPTIONS AND ATTITUDES TOWARDS WILDLIFE? THE CASE OF CANTANHEZ FOREST NATIONAL PARK, GUINEA-BISSAU REPUBLIC

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Resumo

As human population grows and globalization disrupts local and traditional communities everywhere in the planet, there are stronger and wider threats to wildlife and biodiversity. In spite of all the humanity's achievements, difficulties in providing well-being to many human communities are increasing. The world's natural forests, whose rich ecosystems support wildlife and human populations, are declining and facing unprecedented changes. Perceptions and attitudes towards wildlife and biodiversity are also culturally constructed and it is important to know these so that environmental national action plans may be feasible and reliable.

An attitude can be seen as a relatively enduring organization of beliefs about an object or a situation predisposing one to respond favourably or unfavourably to a commodity, person, institution or event. Hence, attitude is an antecedent or determinant of behaviour. And, ultimately, it will be people's behaviour who will determine the survival of wildlife and the forests.

Positive attitudes towards nature may work as a good indicator for wildlife and biodiversity conservation. Perceptions and attitudes are partly culturally constructed and are influenced by several variables that include age, gender, religious affiliation or ethnic group, among other variables.

In this study we explored how religious affiliation may interfere with the perceptions of wildlife. We assessed how individuals living inside the Cantanhez Forest National Park (CFNP) in Guinea-Bissau Republic (GB) perceived their *environment*, i.e., its animals. CFNP's territory is included in an important international biodiversity hotspot (Guinean Forest) and is composed by a mosaic of different ecosystems ranging from mangroves to forest fragments, savannas and crops. Around 25.000 people live in CFNP. The population includes a complex mix of many ethnic groups, i.e. Fulbe, Nalu, Susu, Balanta, Tanda, among others. We present results for Balanta and Nalu, the main ethnic groups present at our field site (Madina), inside the CFNP. During data collection we used a survey questionnaire and interviews were conducted.

We found that aesthetical values overlap food preferences with the most beautiful animals (e.g. gazelle) being simultaneously the most edible. Although chimpanzees are considered ugly (and also non-edible), they are also perceived as the most similar being to humans. Although significative statistical differences were found when considering religious affiliation (e.g. animists, Muslims and Catholics), the same was not found when considering

Key-words: Guinea-Bissau, human dominated landscape, attitudes and local perceptions of wildlife

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1. INTRODUCTION

The world's natural forests, whose rich ecosystems support wildlife and human populations, are rapidly declining (BROOKS et al 2006). Forest ecosystems are facing unprecedented changes. The biggest challenges currently imposed on wildlife and biodiversity occur in the realm of the larger and complex domain of relationships between ecosystems and human cultures (DAVIES-CASE 2001): the *ethnosphere* (SHERIDAN and NYAMWERU 2008). Ethnosphere can be defined as political, religious, economical, and normative

perceptions and attitudes towards ecosystems and its wildlife (SHERIDAN and NYAMWERU 2008). Ethnosphere may also be seen as the sum of *all thoughts, beliefs, myths and institutions made manifest today by the myriad cultures of the world* (DAVIS 2001:8). Such thoughts incorporate the complex web of human-ecosystem relationships (GARIBALDI and TURNER 2004) which include human perceptions of wildlife. Humans perceive and value biodiversity and wildlife elements differently (DAVIS 2001, CASANOVA 2008). While some animal species may be positively perceived because they can be eaten and do not damage crops (or do not compete over natural resources with human populations), others, due to their behaviour (e.g. crop-raiding) may be seen as pests (DAVIES-CASE 2001, GARIBALDI and TURNER 2004, GILLINGHAM and LEE2003).

Ethnosphere knowledge is also important for conservation purposes as it may help to better understand the relationships between humans, ecosystems and wildlife thus allowing for the design of appropriate environmental protection actions and strategies (NEWMARK and HOUGH 2000). Human cultures are crucial components of nature and wildlife conservation and restoration (GARIBALDI and TURNER 2004). Both social and ecological dimensions within ecosystems have co-evolved in a balanced way. The maintenance of wildlife and biodiversity by native communities, for example, has been well documented (BLACKBURN and ANDERSON 1993, ANDERSON 1996, GADGIL, HERMAN and REDDY 1998, TURNER 1999, MINNIS and ELISENS 2000). Traditional conservation practices are unlikely to be accidental artefacts of specific cultures: they are more likely to be the result of long series of reciprocal evolutionary interactions between ecologically intimate organisms (humans included) over long time spans (GADGIL and BERKES 1991).

Wildlife conservation approaches can be *traditional* or *new* (e.g. CAMPBELL 2000, 2002). While the former is exclusive and deals with conservation in parks and protected areas, the latter is inclusive; taking into account land use patterns and sustainable use of wildlife (see WESTERN and WRIGHT 1994 for an example). *New* conservation (the counter-narrative) argues that wildlife conservation must be a bottom up process (controlled and managed by the communities acting as *stakeholders*) while the *traditional conservation* is a top down process [under institutional/state control (CAMPBELL 2000, 2002)].

As human population rises and globalization disrupts local and more traditional communities around the globe, the fate of biodiversity seems to be doomed in a profit driven global economy. Today the threats to biodiversity and wildlife conservation are stronger and broader than even before (BROOKS et al. 2006), as difficulties in providing well-being to many human communities increase in spite of humanity's many achievements. Consequently, human-wildlife conflicts are on the rise across Africa (HILL 1998, BROWNE-NUÑEZ and JONKER 2008) as human population and demand for land intensifies throughout the continent. Much of this conflict takes the form of crop-raiding by wild species. Such conflicts are only predicted to

increase further decreasing land availability for other animals (LEE 2010). Forest systems will likely to be dependent on more and more fragmented patches of land, often already occupied by people.

In addition, many national parks lack funding and law-enforcement. With decreasing budgets and amidst increasing criticism of *fortress conservation* approaches (CAMPBELL 2000, 2002; BROCKINGTON and IGOE 2007), some protected areas are increasingly adopting *community-based conservation* approaches (ADAMS & MCSHANE 1992, ADAMS & HULME 2001, BAUER 2003, CAMPBELL 2002). Nowadays, even national park managers collaborate with local communities in order to improve conservation effectiveness, with approaches ranging from park outreach to co-management (BARROW & MURPHREE 2001, BAUER 2003). The concept of conservation implies protection, maintenance, rehabilitation, restoration, enhancement and sustainable use of populations and ecosystems (IUCN 1991). The *conservation narrative* includes several dimensions that range from the ethics of using wildlife as a resource to the ability of a free market economy to adequately regulate wildlife use. Promoting the sustainable use of wildlife by conservation organizations is in part based on the perceived need to give wildlife an economic value (ROE 1991). However, giving wildlife a market value without implementing control regimes might encourage unsustainable exploitation of species (FREESE 1996). Furthermore, it has often been assumed - particularly in developing countries - that economic benefits are key to gaining support for conservation. However, this assumption has proven false in some situations (ROE 1991). If economic benefits are not perceived or valued as *significant* by its users, conservation will not be sufficiently supported.

Ultimately, it is people's behaviours towards wildlife that will determine the survival of biodiversity (LEE 2010). Biodiversity, wildlife and human cultures are linked since the decline of biological diversity often means the loss of cultural diversity (GARIBALDI and TURNER 2004). Understanding the relationships between human settlements, ecosystems, hunting and agricultural patterns is fundamental for predicting the viability of wildlife populations. Positive attitudes towards nature and wildlife may act as good indicators for conservation (CASANOVA 2008).

Perceptions (and attitudes) are partly¹ culturally constructed and are influenced by several variables such as age, gender, religious affiliation and ethnic groups (ASLIN and BENNETT 2000; BAUER 2003; B BROWNE-NUÑEZ and JONKER 2008; CASANOVA 2008; DOUGHERTY, FULTON and ANDERSON 2003; GILLINGHAM and LEE 2003; HILL 1998, 2004; INFELD and NAMARA 2001; ITE 1996; KURIYAN 2004; LEE and GRANHAM 2006; MANFREDO and DAYER 2004; MILLER and MCGEE 2000; NOSS and CUÉLLAR 2001; OBA and KAITIRA 2006; OBA and KOTILE 2001; SARFO-MENSA and ODURO 2010; SEKHAR 2003; SOTO et al. 2001; WHITE 1967; ZINN and PIERCE 2002).

¹ Individual experience also shapes perceptions and attitudes.

In this article we examine local perceptions and attitudes towards wildlife - focusing mainly on non human primates (hereafter NHP) - among local communities living inside a recently created (2007) national Park in GB, the CFNP. NHP are of special importance given their IUCN conservation status: for example chimpanzees (*Pan troglodytes verus*) are endangered, Guinea baboons (*Papio hamadryas papio*) are near threatened, black and white western colobus monkeys (*Colobus polykomos*) are considered vulnerable, western red colobus (*Procolobus badius temminckii*) are categorized as endangered and the sooty mangabey (*Cercocebus atys*) is classified as vulnerable. Many of these NHP can be seen in the CFNP. Also, NHP play a special role in the park because one species (the chimpanzee) was chosen as a flag-species by the main local NGO to represent the park (COSTA 2010).

The CFNP is an important biodiversity hotspot (Guinean Forest) where diverse animals have been reported (see REINER and SIMÕES 1999; CASANOVA, SOUSA and COSTA in press).

The CFNP was established by the governmental organization IBAP (Instituto da Biodiversidade e das Áreas Protegidas), some NGO's (e.g. AD, Tiniguena, etc.) and several communities living inside the CFNP. Part of the CFNP territory (which encompasses ~ 1067.67 km²) borders with the Republic of Guinea. In the CFNP decision-making processes are in the hand of local traditional authorities. But in the last decades the declining power of traditional institutions has been accompanied by a weakening authority over forests and its resources (CASANOVA and SOUSA 2006 and 2007; TEMUDO 2009a, 2011). Yet, institutions (traditional and "modern") play a key role in maintaining the condition of the forests and ecosystem resources by indirectly mediating the effects of social and cultural norms, state policies, technological variables, market levels and demographic pressures (AGRAWAL 1995, 1996). Local rules and regulations designated by local traditional institutions can be effective in natural resource management but the other hand, these regulations and rules are not always combined with effective monitoring and enforcement (OSTROM 2000). Some even argue that *traditional institutions* are relics of the past and are too weak to mediate the underlying drivers of forest and biodiversity degradation today (MCKEAN 2000). The weakening of the culturally-based institutions has been attributed to the adoption of Western religious beliefs, the erosion of traditional environmental knowledge systems, the ethnic diversity and the increased inequality of its users (FORTMANN and NIHRA 1992).

With this article we aim to provide an overall view of the main variables influencing wildlife perceptions in the CFNP: religious affiliation and ethnicity.

The present work is an exploratory and descriptive study of our sample population with four major aims:

- i) To characterize socio-demographic and economic data (e.g. income and household features, trends between certain variables, material possessions and main income-earning activities) and
- ii) to assess attitudes towards wildlife (e.g. how locals classify wildlife), and principally to characterized the aesthetical perceptions of wildlife along with the connotations associated with specific species (e.g. pests).

We expect to find a correlation between the economic data collected (e.g. wealth) and perceptions and attitudes towards its wildlife. Economic data, especially those regarding wealth, are not easy to measure in some rural African settings as is the case here. In some of the villages visited (CASANOVA and SOUSA, personal observation 2007) product exchanged was used in place of money. Thus, some of the indicators used in industrialized countries (e.g. salary, bank account, etc) were not applicable to this. On the other hand, the existence of products, material possessions and its circulation can be seen. For example, in GB not everybody has money to buy houses with zinc roofs but buying a radio or flashlight does not imply such a great financial burden as buying a house with zinc roofing. Different degrees of wealth can be identified according to the amount of money needed to acquire material possessions. We know that the amount of financial resources necessary to acquire a zinc roof is higher than the amount necessary to buy a motorbike, a bicycle, a mobile phone, a radio or a flashlight. The amount of material possessions an individual of family has maybe a good indicator of cash crop existence or of other activities that generate economic feedback.

Finally, we expect to find positive attitudes towards wildlife with the exception of species that crop-raid or may constitute a danger to humans. Regarding NHP, we predict that specific species will be perceived as pests due to more intense crop-raiding behaviour, while others - such as the chimpanzee - although also involved in crop-raiding incidents may be seen under a more positive light due to (a) their similarity to humans and (b) the fact that crop-raiding damage by them is not as strong as in other NHP².

Results are expected to vary across ethnic groups and religious affiliation as in other similar conservation settings (BROWNE-NUÑEZ and JONKER 2008; GILLINGHAM and LEE 2003; HILL 1998, 2004; INFIELD and NAMARA 2001; ITE 1996; KURIYAN 2004; LEE and GRAHAM 2006; MANFREDO and DAYER 2004; NOSS and CUÉLLAR 2001; OBA and KAITIRA 2006; SEKHAR 2003; ZINN and PIERCE 2002).

Such hypothesis and predictions are important as these have implications for conservation (LEE 2010).

² When crop-raiding on cashew field plantations, chimpanzees are not negatively perceived since they do not eat the nut but only the fruit (Casanova and Sousa, personal observation 2005, Hockings and Sousa, in press).

2. METHODS

2.1 Study area: background and context

Guinea-Bissau is one of the smallest countries in the western coast of Africa, with a total area of 36.120 km². It shares its northern border with Senegal and its south-east border with the Republic of Guinea. It is located at 10°55'–12°40'N and 13°38'–16°43'W. The country is made up of the mainland and several offshore islands (Bijago's Archipelago). The Guinea-Bissau islands are almost linked to the continent by wide intertidal mud flats. The topography of the country is low-lying, rising eastwards from sea level (highest point at 260m). Small areas of primary subtropical forest (the Guinean Forest which constitutes a biodiversity hotspot) are found in the south-west (Tombali and Quínara regions) and in the north-west (Cacheu region). The biologically richest area of this country, with extensive mangroves, mudflats and sub-humid forest fragments is located on the basin of the Tombali, Cumbija and Cacine rivers, and where the CFNP is located. While some advocate that the CFNP is a set of several forest fragments that were once a continuous forested area (e.g. CLEAVER 1992), other argue that some forests are the *by-product* of human communities, created and maintained events for several reasons: protection during colonial wars, protection against fire, economic benefits, etc. (FAIHEAD and LEACH 1995, SHERIDAN and NYAMWERU 2008). Since the 15th Century (D'ALMADA 1594 or CASANOVA 2012 for a review of early descriptions of GB) that many parts of Africa have become humanized dominated landscapes with numerous villages, roads, paths, water holes, crops and other signs of human activities.

The Park is composed of a mosaic of different ecosystems. Mangrove swamp rice areas occupy around 8959.499 ha of the CFNP while other food crops occupy ~ 7319.236 ha (SIMÃO et al 2004). The Park houses a complex mix of many ethnic groups (e.g. Fulbe, Nalu, Susu, Balanta, Tanda, among others). More information about the Park and its plant and animal biodiversity can be seen in CASANOVA et al. (in press).

The diverse range of ethnic groups engage in different agricultural practices ranging from cultivating specialized mangrove swamp rice/paddy rice (performed mainly by Balanta), to rain-fed rice in the uplands (see TEMUDO 2011 for more details on rice crops)]. The latter implies yearly clearing of forest areas (*shifting/swidden* cultivation). Fulbe, Nalu and other ethnic groups use such techniques (CASANOVA 2008). Rice is the major food item in the diet of the communities living in GB³. Large cashew-nut plantations are found across the park along with several fruit crops (orchards with orange, lemon, pineapple and other fruits). Some of these cashew-nuts plantations, fruit orchards and rain fed rice plantations (along with cassava, sweet potato and other crops) are located within forest fragments. Apart from protected forest fragments, the CFNP also encloses buffer zones. Very small areas within forest fragments are considered

³ When rice is not available, even with other food items available, villagers speak of *hunger* (Costa 2010).

*sacred*⁴ since several ceremonial rituals often take place there. Only certain people are allowed to enter these sacred spaces. We were often told by many villagers that people who enter without permission will never come back because the *irãs*⁵ may get upset and punish the *intruders*. Thus physical access to the different parts of a forest fragment is based on different *degrees of behavioural freedom*.

Some of the crops inside the CFNP (e.g. cashew-nut) are mainly cash-crops (TEMUDO 2011). As a highly fragmented habitat, the CFNP can be characterized as a human dominated landscape, where both wildlife and humans share and compete for natural resources (CASANOVA 2008).

The basic social unit in the CFNP (and GB) is the *morança*, a residential area composed of one or more houses and households. Villages in rural areas (*tabancas*) are usually made up of several *moranças*.

The first settlers and traditional owners of CFNP territory (which mainly occupies a large peninsula) are the Nalu and they named the area Cubucaré [Cubucaré Peninsula (CP)]. All other ethnic groups who subsequently settled there are considered *guests*. Although collective use of land occurs in the CP, land use in GB has been suffering under the influence of countless individual and State-driven land processes. During colonial times, specific models were imposed to exploit the land. Today land exploitation continues as a results of globalization possibly also neo-colonial impositions [e.g. in the 1980's structural adjustment programs and the market economy were adopted (TEMUDO 2011)].

In the CFNP, resistance to such influences can only be seen in some traditional and local/regional authorities: the *regulados* (chieftaincies). *Regulados* are acknowledged by the GB formal and national authorities (e.g. regional and national governments) and pay an important role in decision-making processes regarding land use. *Régulos* (chieftains who have several villages under their authority) and *tabancas chefes* (village chiefs) are the ones who can decide the location of a new *morança*, where crops may be cultivated, the specific kapok (or other) trees permitted to be cut and the areas of the forest fragment to be cleared. *Social acceptance* is often the main technique used to enforce this type of local power. The establishment of the CFNP changed some of these rules but law and enforcement by governmental authorities are not present in the territory (such control is achieved by co-operation between local authorities and staff from NGO's). The decisions of local authorities are sometimes combined with legal land-possession where administrative processes may contribute to strengthen traditional decisions. Thus, in most of the CP access to the forest and its resources are still mediated by traditional figures of power.

⁴ Sacred-forest is a highly dynamic concept (see also Sheridan and Nyamweru 2008). Additionally, spatially speaking, the territory occupied by sacred-forests may changes.

⁵ *Irãs* are magical and religious entities that live in the forest. As predicted in many African communities due to marked age roles, elder people can provide more information regarding the *irãs* than young people.

To certain extend the colonial land reform and “modern” land “rationalization” diminished the importance of traditional rules. The communities within and around the CFNP have been exposed to the erosion of the globalization process and to the market economy values (e.g. forest and wildlife are perceived as *products* that have specific *prices/values*). In most African countries, common-access forests are frequented by many groups - such as nomadic herders and villagers – who have free access and rights to much of the forest land as long as certain rules are adhered to. Even if local governments state that free access is illegal, the practice is tolerated because it is impossible to police the forest and its borders or because there is an implicit approval (DAVIES-CASE 2011) sometimes even by some State agents. Thus, tribal lands are owned communally and to which usufruct rights are granted to local populations by traditional authorities such as *régulos* and *chefes*. This is the case of the CP where traditional power is recognized and shapes many interactions between the ecosystem and its human communities. Nonetheless the influence of local NGO’s in the traditional decision-making processes and its connection to local authorities (COSTA 2010, TEMUDO 2009a) is contributing to the change in perceptions and attitudes.

The degradation of numerous forest fragments in the CFNP (CASANOVA & SOUSA 2005, 2006 and 2007), including sacred-forests⁶, has led us to think that “traditional” rules and regulations alone are not sufficient to mediate the effect of the increasing demographic and market pressures on local natural resources (CASANOVA & SOUSA 2005, 2006 and 2007).

Swidden (itinerant) cultivation implies that large portions of forest are being cleared every year. The generalized use of rifles for hunting (used also to feed the bushmeat market in the urban areas but not only) is an additional threat to the CFNP’s wildlife (CASANOVA & SOUSA 2007). Snares can be easily found within the CFNP (CASANOVA & SOUSA 2007).

2.2 Data collection

Between 2007 and 2010 we used attitudinal questionnaires (with both open-ended and closed questions) to gather data from villagers belonging to two major ethnic groups living inside the CFNP territory: the Balanta and the Nalu. These two ethnic groups were chosen for specific reasons: the Nalu are the oldest group living in the CP (D’ALMADA 1594) and thus its people are fairly represented inside the Park and in our sample. Although the Balanta have been present within park boundaries for a lesser time than the Nalu, the Balanta present a very different identity and way of life in comparison to most other ethnic groups living in GB (CARDOSO 1996, PÉLISSIER 1989, TEMUDO 2009b, VAN GENT and UKKERMAN 1993). The Balanta seem to be less affected by external influences [e.g. globalization, Muslim influence, agricultural practices, etc. (LUNDY 2012, TEMUDO 2009b)]. Thus their perceptions towards wildlife and the forest are important to

⁶ The today’s concept of sacred-forest is not immune to external variables.

understanding a significant part of the sample population living inside the park and with a different religious affiliation.

Most questionnaires were conducted in villages near important forest fragments. Surveys were not self-administered since most of our respondents were illiterate. All surveys were conducted by interviewers.

Although the present study was conducted with IBAP's authorization, permission was also sought from the traditional power institutions (*régulos* and *chefes*) and the respondents. Interviewers (N=271) belong to different villages (*tabancas*) to ensure that that answers would not represent specific villages and to reach as many as different areas of the park as possible.

The surveys focused on the four major dimensions previously mentioned. Control questions were used to triangulate information and the reliability of the data provided by respondents. Due to the ethnic diversity within the CFNP where many respondents do not speak Creole, the national language, we used both wild and domestic local animal photographs to make sure that both interviewers and respondents were referring to the same animals. Wild and domestic species were randomly selected from a set of reported animals for the region. A control photo with an American mammal (capuchin monkey, *Cebus apella*) was also used. Interpreters were used, especially, but not limited to, when individuals did not speak Creole. Interpreters were instructed on how to ask the questions and all the goals and meanings of each question (and specific words) were previously given.

Our survey sample (N=271) was composed of individuals of both sexes and of different age groups (non-probabilistic quota and multiphase sampling)⁷. The age groups chosen for our study were: 14-19; 20-39 and 40 years old or more (Table 1). The wide intervals between age groups were adopted because many respondents did not know their exact age. Most knew only that they were born in the dry or wet season. Our multiphase sample was a non random procedure which means that our conclusions cannot be generalized to the rest of the population living inside the CFNP.

As some practices are illegal inside the park territory (hunting specific animals and NHP bushmeat trade) we also conducted semi-structured interviews with local hunters to gather more information on these practices. The interviews (N=32) took place between 2007 and 2010. During this period (2007-2010) we went to the field every year and we remained in the field between three weeks to three months, during the dry season (from October to May). Interview scripts were based on topics connected with hunting, bushmeat trade,

⁷ We chose a non-probabilistic sample because the total N of people living inside the park was not available. As previously mentioned, current censuses are not reliable and thus probabilistic sample could not be used. Though we did interview respondents of both sexes and of different group ages, we did not match correspondent proportions of the sample population strata with the universe (all people living inside the CFNP).

domestic animals, law enforcement and other park rules. We asked *regulos* and *chefes* to identify the hunters to be interviewed.

2.3 Data analysis

We computed *Kolmogorov-Smirnov Z* to test for data normality and the result was significant ($p=0.03$) which meant the data were not normally distributed. Thus, non parametric tests were used. The *Wilcoxon Mann Whitney-U* test was computed to test for a significant difference between two samples of independent observations. We also computed the *Kruskal-Wallis One-Way Analysis of Variance* for comparing if three or more samples were independent. Results were considered significant when $p \leq 0.05$.

AGE	Ethnic Group: Nalu		Ethnic Group: Balanta	
	SEX		SEX	
	Male	Female	Male	Female
14-19	25	20	25	20
20-39	30	20	31	20
40 and +	20	20	20	20
Totals	75	60	76	60

Table 1. Features of non random sample

3. RESULTS

3.1 Socio-demographic and economic data

Here we present a figure which provides a general overview of the sample population.

Figure 1 presents information about the religious affiliations of the respondents. Contrary to variables such as *ethnic group* ($p=0.07$) or *age* ($p=0.09$) belonging to a specific *religious affiliation* did have a significant statistical correlation ($p=0.01$) with specific answers regarding the ways how animals are classified and perceived. Thus, all results presented here are mainly connected with the significant statistical differences between the variable *religious affiliation* and a specific variable of our study (e.g. aesthetic value of animals, hunted species, beliefs of forest and animal survival/conservation, etc.). Most responses had a significant statistical correlation with *religious affiliation* [and *gender* (although gender issues will be discussed with in a future publication)].

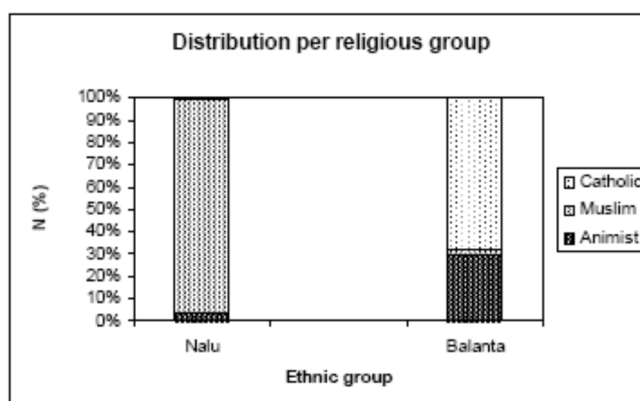


Figure 1: Distribution of Nalu and Balanta per major religious groups (N=271)

Most Nalu are Muslim while most Balanta are Catholic or Animists. Although most Nalu, identify themselves as Muslims, they also engaged in animistic practices and beliefs, such as various *irãs*. *Irãs* are animistic magic and religious entities. The same was true for most Catholic Balanta. This religious syncretism has been previously described by many authors for this country (e.g. DIAS 1956; GONÇALVES 1958, 1961; HARRISON 1998; MOTA 1954). Our data suggests that there may be different Muslim categories because when discussing practices such as eating specific food items and/or earning money from specific activities which are considered inappropriate or unethical according to Islamic principles, while some Muslims were named *pure*, other were called *impure*. Many Muslim respondents draw a straightforward and clear separation between *pure* and *impure* Muslims (CASANOVA and SOUSA, in preparation). *Pure* Muslims do not drink alcohol, do not eat warthogs, bush pigs and NHP and are not involved in the bushmeat trade of these species. The *impure* Muslims, however, drinking alcohol, eat and/are involved in the bushmeat trade of such species, and such behaviours are tolerated (CASANOVA 2008).

Figure 2 represents the Nalu's main income-earning activities. Respondents were asked which activity brought the most income to the household. Most individuals stated that their crops (e.g. cassava, sweet potato, peanuts, cashew plantation, orchards, etc.) represented the highest income activities earned and flowed evenly by rice crops (mangrove and rain fed) and oil palm production.

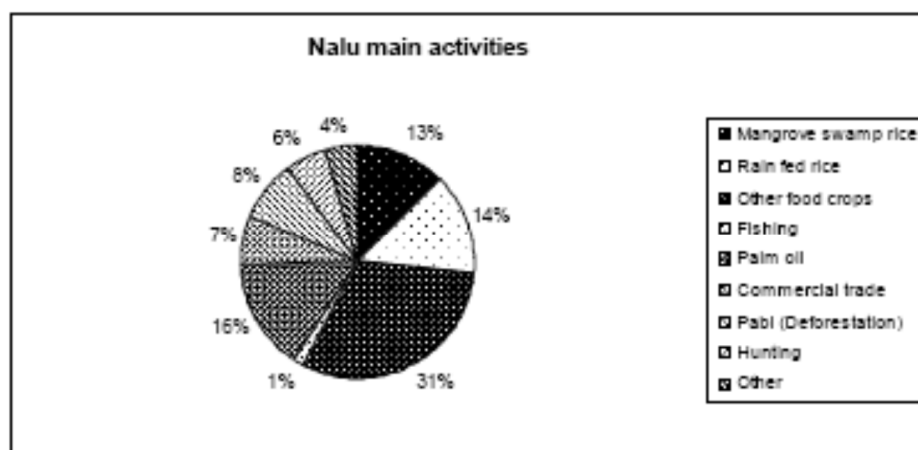


Figure 2: Income per activity among Nalu (n=135)

Forest clearing⁸, commercial trade and hunting also represent important activities (time-consuming) for the Nalu.

Swamp rice (30%) and palm oil production (24%) followed by other food crops provide the most income to the Balanta (Figure 3). Rain fed rice and fishing are also an important source of income for the Balanta. The Balanta rely more on mangrove swamp rice while the Nalu rely on other food crops. Some of these food crops are simultaneously cash-crops: that is the case of cashew or peanuts (TEMUDO 2011).

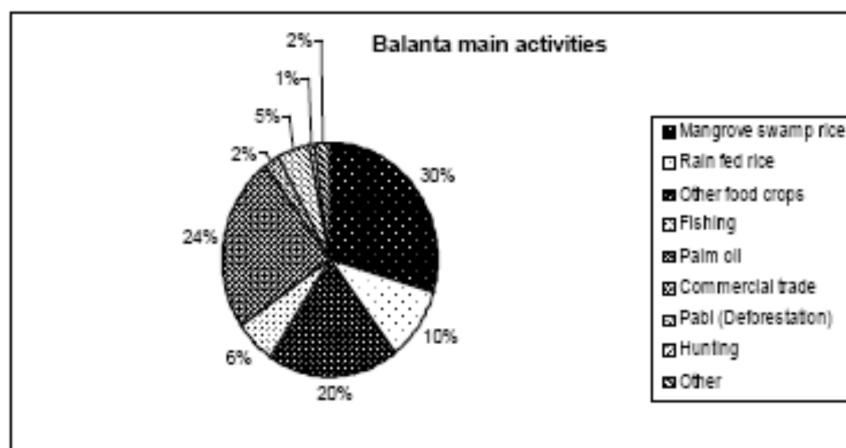


Figure 3: Income per activity among Balanta (n=136)

To measure wealth among both ethnic groups, we asked questions regarding material possessions, such as houses with zinc roofs, the ownership of radios, bicycles, motorbikes, mobile phones or flashlights.

Differences between Nalu and Balanta are significant for almost all items ($p \leq 0.05$). Flashlight ownership represents the most significant difference between both groups ($p = 0.031$). Nalu respondents appear to have

⁸ Some farmers pay individuals to clear specific forested areas so that they can later plant crops. This activity is named *pabi* (Creole).

more material possessions than the Nalu [with the exception of the flashlight which is the only that is better represented among the Balanta (see Figure 4)].

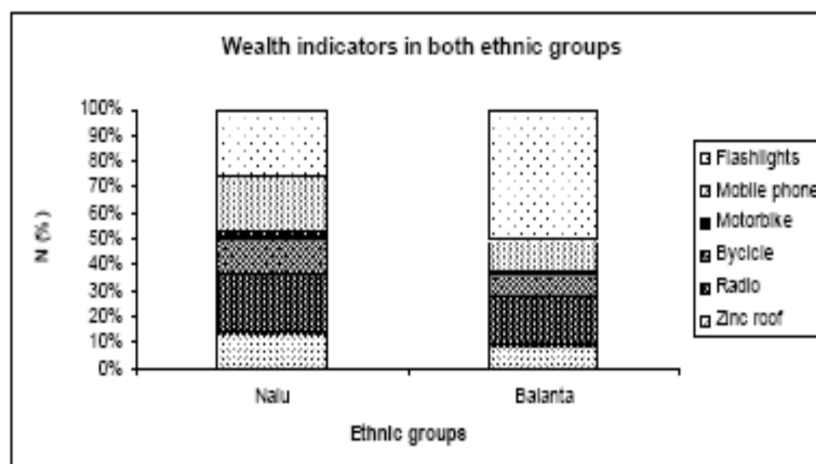


Figure 4: Wealth in both ethnic groups (N=271)

3.2 Local classification of wildlife

Wildlife was perceived in different ways according to its features: from crop raiding and having a negative impact on economic feedback (and other utilitarian dimensions of wild species), to harmless wild animals that do not compete for resources with humans. Several characteristics were considered by locals to *classify* an animal: the aesthetic dimension of animals represented one category. Aesthetic perceptions were related to animal edibility, for many animals [e.g gazelle (see Figure 5)]. Some domestic animals are perceived as equally beautiful. Such visions of biodiversity organisms are highly *utilitarian* (CASANOVA 2008) where aesthetic values are generally, but not always, linked to daily food safety concerns (CASANOVA 2008; see ROQUE DE PINHO 2009 for interesting data on aesthetic values for Maasai).

Animals perceived as ugly are mainly the chimpanzee and other NHP and the hyena. But there are differences since Muslims are much more *adverse* to NHP (at least 60% of these respondents' perceived chimpanzees as the ugliest animal and exhibited disgust in reference to NHP). NHP are considered to be similar to humans but chimpanzees are seen as being more similar to humans than any other animal, especially by Animists and by Muslim (see Figure 7).

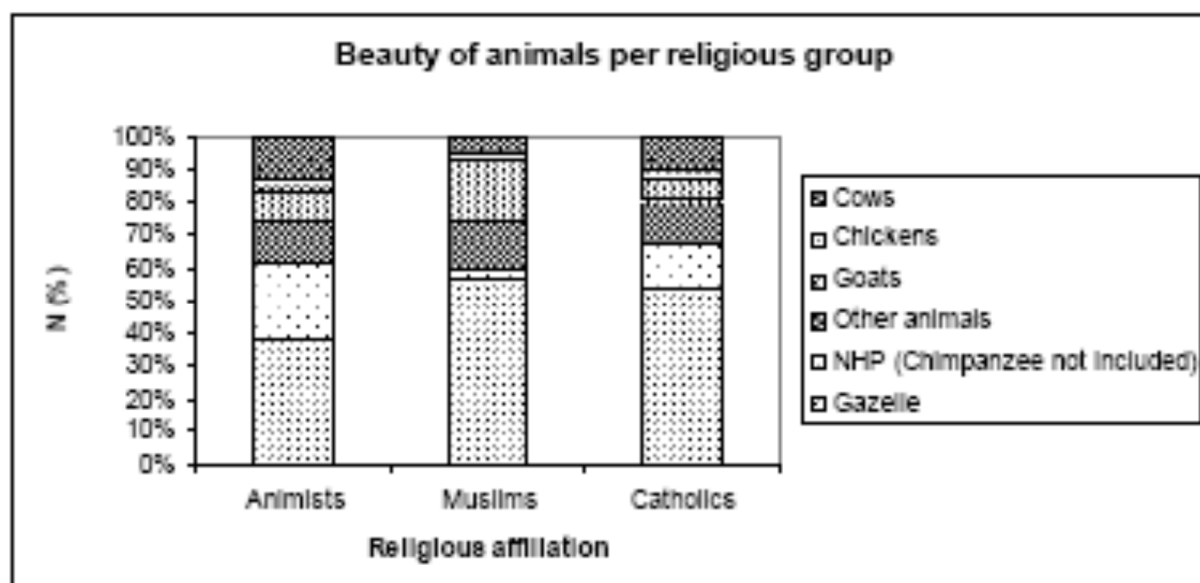


Figure 5: Beautiful animals per religious group (N=271)

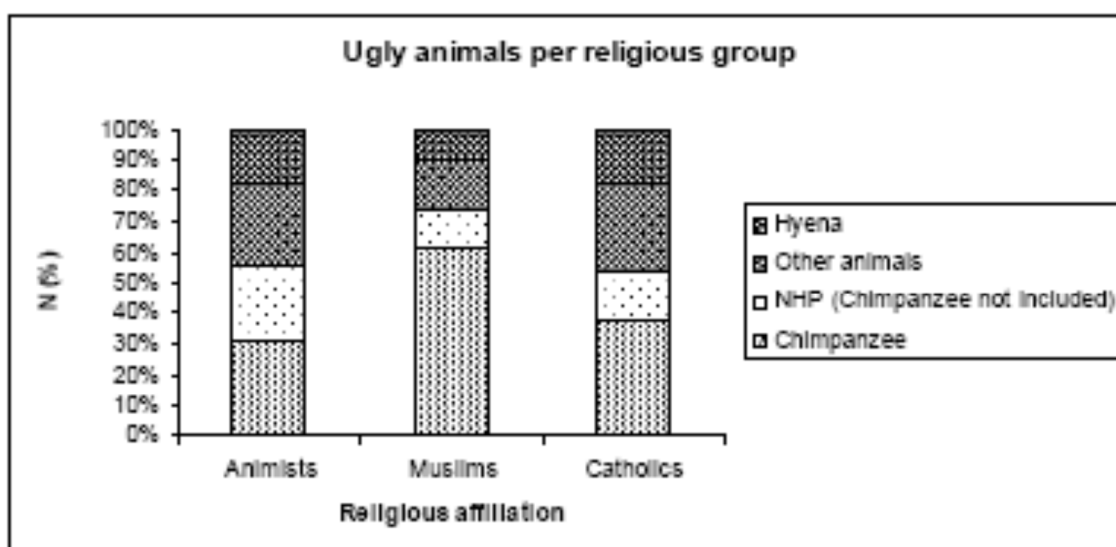


Figure 6: Ugliness in animals per religious group (N=271)

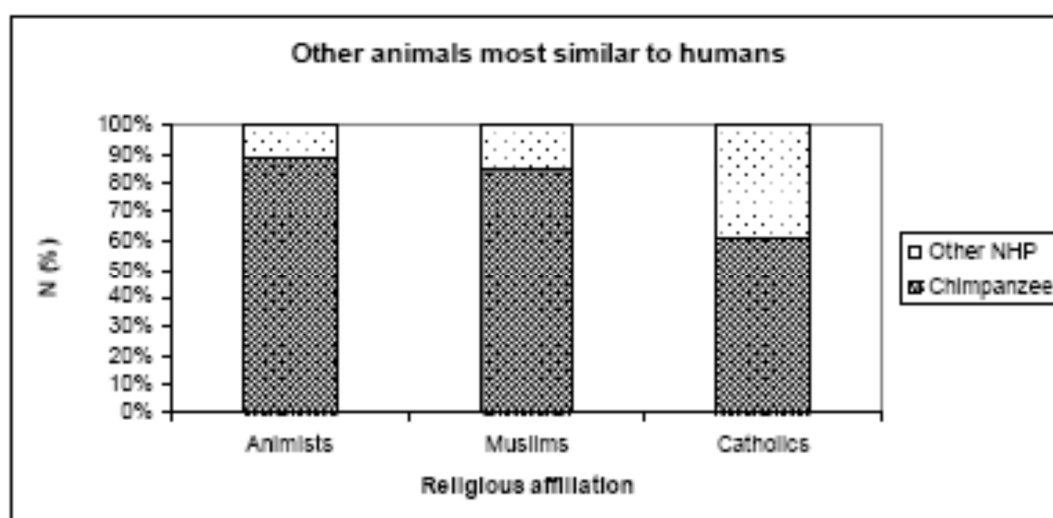


Figure 7: Perceptions of species' similarity with humans (N=271)

4. DISCUSSION

Characterizing our sample, the majority of Muslims (mainly the Nalu) had more material possessions than the other ethnic group in the sample population. This reflects the existence of cash flow most likely due to cash crops such (see TEMUDO 2011) but also due to illegal hunting to feed the bushmeat market (CASANOVA & SOUSA 2007, STARIN 2010). Though the Nalu owed more material possessions overall, the Balanta respondents had more flashlights than the Nalus. This is understandable since the Balantas live in more isolated environments, often in their own *tabancas*. While the Nalu people (mainly Muslims) are generally concentrated in large *tabancas* where there may be electricity and other energy source such as small generators (Iemberém, Madina, Guiledge, among other *tabancas*), the Balanta *tabancas* are located along rivers (sometimes by the sea) and away from the rest of most other ethnic groups. The Balanta are more reserved and may be seen as more *environmental-friendly* rice growers (according to our data, they cultivate more swamp rice than rain fed rice – see also VAN GENT and UKKERMAN 1993 and TEMUDO 2011). Thus, the *entrepreneurship* that characterizes Muslims (mainly the Nalu people from of our sample population) can be seen through their involvement in commercial trading via cash crops and the bushmeat market. This allows them to have more material possessions (such as a higher percentage of mobile phones, radios, houses with zinc roofs, bicycles and motorbikes). Similar results were found by AMADOR, CASANOVA and LEE (2012) between the Balanta and the Beafada in Cufada Lagoon Natural Park (also in GB) where the Beafada (Muslims) seem to be wealthier than the Balanta. In Cufada Lagoon Natural Park the latter also live more isolated from the main villages and therefore need flashlights when they want to move at night. The prices of flashlights are not as high as the price of most other items. Such data show us that the Nalu [and the Beafada (AMADOR et al. 2012)] are richer than the Balanta if only cash flow is considered.

Gazelles are the preferred wild animal to eat but NHP are also popular.

The political and military turmoil that the country has suffered since the liberation war (from the Portuguese colonialist government) in the 60's to the present may explain the need of maintaining a secure protein source (domestic animals) that provides nutrients only in special occasions of if war comes again. In rural areas, while there is no war and there are no special celebrations, wild animals provide the necessary proteins. Civil wars, *coup d'états* or highly violent political assassinations of rivals are common in GB. The almost non-existence of the State is marked by a strong dependency for foreign aid, by the use of the country as a cocaine/drug platform (ELLIS 2009, FELBAB-BROWN 2010) which acts as an intermediary for shipping prohibited substances to Europe, and, by the *bribe culture* well ensconced in the country (e.g. ELLIS 2006, TEMUDO 2009a). As a result of such turmoil, domestic animals in rural areas are perceived as safety nets. However, cash crops may also be perceived as *safety nets* which, when under attack (crop-raiding by wildlife), must be defended. Animals that crop-raid are immediately perceived as having negative qualities (although these may be capitalized via bushmeat to provide economic feedback). Food security was the main concern of most respondents where aesthetic values of wildlife overlap with the preferred animals to eat: the gazelle, is, simultaneously the most *beautiful* animal and the preferred animal to eat. *Beautiful* was explained to respondents as something that is *attractive to the eye* but does not have necessarily to be good to eat. Still, the classification of animals seems to be built around principles such as food security and economic feedback (an Occidental and market vision). The fact that several domestic animals were also perceived as *beautiful* (and edible) confirms such rational behind the local classification. Therefore, non edible wildlife is perceived as *ugly* (e.g. hyenas, chimpanzees, among other). Chimpanzees represent a contradiction to this line of thought, mainly due to their similarity to humans. Chimpanzees were perceived as the animal most similar to humans but also as the *ugliest* one. This is not to say that humans are ugly but that chimpanzees are perceived as imperfect (regarding humans) or almost perfect (since they are the most similar to humans). This notion is confirmed in another study where most respondents answered that, if they could not be humans, they would choose to be chimpanzees (CASANOVA 2008, COSTA 2010).

Our data also show that Occidental-based concepts such as *protected species* (or *protected areas*) may be wrongly perceived when introduced in different cultural contexts. The notion of *protection* is perceived by many as an approval given by the State to allow further exploitation of certain species/areas (without so many restrictions). According to the respondents, these species are not *protected from* humans but *by* humans for the benefit of people. Simplistic transpositions of concepts amongst very different cultural contexts such as these may have many negative impacts on biodiversity conservation. The State attributes the category of *protected* as the State is a category immediately below God (TEMUDO 2009a).

Our results cannot be generalized beyond the sample population used. Multiphase sampling was a non random procedure which did not allow for extrapolations even within the entire CFNP. Furthermore, individuals and communities can not necessarily be considered as homogeneous categories with respect to their understanding, perceptions, expectations and behaviours towards biodiversity conservation, which could have implications for the success or failure of conservation programmes.

The extrapolations presented by some works (ITE 1996, HILL 1998) may be incorrect from a methodological point of view since random sampling was not possible in many studies (or no information was provided regarding the target population, the sample type and the sample's representativeness). As such, the conclusions of a specific sample cannot always be generalized for the rest of the population. There are standard protocols in any survey questionnaire used in social sciences (SAMPIERI et al 2007) which are not followed by many authors dedicated to the human-non human interface. General trends must be used with precaution (or taken with a grain of salt). Researchers face several difficulties when conducting social surveys of interviews in Africa. They battle with language barriers, cultural differences between themselves and the local people, nomadicism, a lack of reliable census information, transport and other logistic concerns and many other issues. Some of these difficulties will naturally affect the methods (and techniques) used by researchers.

5. FINAL REMARKS

Perceptions and attitudes are good indicators of behaviours (AJZEN and PETERSON 1988, ROKEACH 1966), which ultimately will determine biodiversity sustainability (DAVIES-CASE 2001, LEE 2010).

Traditional perceptions of nature and wildlife in Africa have been exposed to the erosion of the globalization process, to market economy values (KURIYAN 2004, CASANOVA 2008) to centuries of religious intervention and thought *orientation* (HARRISON 1988; GONÇALVES 1958, 1961; MOTA 1954; PÉLISSIER 1989). Religious affiliation is thus of great importance when considering perceptions of wildlife; religion affects the way people perceive other animals (BROWNE-NUÑEZ and JONKER 2008; HILL 2004; ITE 1996; MANFREDO and DAYER 2004; NOSS and CUÉLLAR 2001; SEKHAR 2003).

Local beliefs and practices towards wildlife are changing. For some (e.g. SOTO et al. 2002) acknowledging the fragility of certain local practices and changing behaviours may be decisive for conservation. These argue that foreign intervention is needed (SCHALLER 2000).

Human communities have been adopting environmental friendly practices across time with both social and ecological ecosystem dimensions evolving in a balanced way⁹ (ANDERSON 1996; BLACKBURN and ANDERSON 1993; GADGIL and BERKES 1991; GADGIL et al. 1998; TURNER 1999). Local taboos (COLDING and FOLKE 1997, 2001), environmental-friendly practices, forest-friendly traditional management systems and other phenomenon are not new and may be considered as conservation tools since they play an important role in sustainability (CASANOVA 2008). Whether such phenomenon will resist the changes provoked by globalization and the market philosophy is subject to debate, since traditional beliefs are not immune to external influences. Resilience to western-like values such as the market economy in the way livelihoods sustain themselves is still to be seen. In fact, traditional societies are suffering the erosion of destructive forces (e.g. market economy and globalization via the presence of NGOs with the *traditional* or *new conservation* speech, the State institutions and various other enculturation agents and organizations). In narratives (*traditional* and *new conservation*), wildlife and forests are threatened by extinction being the *crisis* context always present (TEMUDO 2009a). Along with such narrative, comes the free market speech to *regulate* the use of ecosystems and their *services*. Nevertheless, there is little argument against the fact that the forests of the world (and the wildlife they sustain) are declining. The main debatable point seems to be the rate or intensity of this decline. The ecosystems that have supported the earth's diverse and complex social systems are facing unprecedented changes (GARIBALDI and TURNER 2004). Some authors (e.g. SCHALLER 2000) argue that local control over resources alone will not assure sustainability and that communities need technical assistance to determine biological limits to harvesting resources and for monitoring and managing them (op. cit.). This is a rather *interventionist* (named by some as *neo-colonialist*) perspective. Others argue that local communities must be left alone, without any kind of interference.

The support of national parks by local people comes from the perception of costs and benefits against the backdrop of social, political, cultural and economic considerations (ITE 1996, FREESE 1998). The protection of biodiversity is seen within a global market economy framework (FREESE 1998) where everything is associated to costs and benefits. Guinea-Bissau does not seem to be exempt to such influence. This is a time of change for forests, wildlife and for forest communities.

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⁹ See also TEMUDO (2009a) that argues that was the case of the Nalu people and their natural resource management system.

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