A Preliminary Assessment of Mushere People's Perceptions of the Dulu Forest: Implications for Conservation

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Abstract: The study was aimed at understanding the perceptions of three communities in Mushere about the Dulu forest, and the perceptions around its conservation, the main drivers of its degradation, possible ways of mitigation and the conservation implications of such perceptions. Methods involved the use of semi-structured open-ended questionnaires for data collection. The predominant perception of the forest was a place for timber extraction (51%), which was mainly for commercial purposes (85%). Respondents perceived that the Dulu forest has been greatly degraded (93%) and the main drivers were logging (64%), hunting/logging (23%) and increase in human population and hence demand for more farmlands (4%). Finally, 93% respondents showed willingness to participate in the conservation of the forest. These findings reveal Mushere people’s perceptions of the forest, and the main drivers of the degradation of the forest. We suggest the need for an immediate conservation interventive measure in the protection of the Dulu forest, building on the positive attitude and community willingness towards the conservation of the Dulu forest.

Keywords: Forest Conservation, Dulu Forest

INTRODUCTION

Many studies have observed the crucial role that understanding people’s perceptions plays in conservation (e.g., Bennett 2016; Beh, Bruyere & Lолосosi 2013; Allendorf & Songer 2012; Sundaresan et al. 2012; Hun, Mizoure & Yoshida, 2010; Kuriyan, 2010; Gillingham & Lee 2002; Fiallo & Jacobson 1995; Brandon & wells, 1992). For example, Allendorf and Songer (2012), observed that protected areas (PA) management decisions are usually taken without recourse to the local communities surrounding the PAs, and suggested that one way to improve PA-park people relationship was through understanding park-people’s perceptions of PA. Also, Allendorf et al (2006), associated a positive attitude towards three PAs with a perception of conservation benefits, especially benefits resulting from management of the areas. They also found that positive attitudes towards PAs were more correlated with perceptions than with socio-economic variables. These studies mostly had one central theme; the importance of understanding perceptions of players involved in conservation about not only the environment and biodiversity, but the conservation management as well. Studies on perceptions are also useful for addressing issues such as finding out changes that have occurred in a place, drivers of the change and how to mitigate or enhance such changes where they are positive. Theoretically, Gifford & Sussman (2012) listed variables that determine people’s concern for the environment to include age, gender and place of residence (i.e. urban-rural) and direct experiences with nature. Literature about gender and perceptions of the environment suggests that women show more positive attitudes toward the environment than men (Torgler et al 2008). Studies have suggested that age is usually negatively correlated to environmental perception, with younger people showing more positive attitudes towards the environment than older individuals (Whitehead 1991; Howell & Laska 1992; Torgler,Valinas-Garcia & MacIntyre (2008). However, there are conflicting results in this regard (e.g., Wiernik, Ones, & Dilchert (2013). This study aimed to find out the following about the perceptions of the Mushere people about the Dulu forest:

1. Changes that have occurred in the Dulu forest;
2. Causes/drivers of those changes.
3. Possible ways of mitigation.

METHODOLOGY

Study Area

Mushere is in Bokkos Local Government Area of Plateau State, Nigeria at 9° 9’ 0’’ N, 9° 3’ 0’’ E. The Mushere are one of the tribes occupying the southern side of the Jos Plateau. The northern part of their tribal area is on the open high plateau at around 1200 metres ASL, while the southern part extends through the maze of hills and valleys through which the plateau descends to the Benue Valley lowlands in the south, at about 300 metres ASL - there is no escarpment in this area.
The Mushere belong in the Chadic-language groups (Meek 1925; Danfulani 1995; Longtau 2012) along with their neighbours, the Mwaghavul, Mupun, Ngas, and Chakfem with whom they share language and cultural similarities, and who are believed to have the same ancestry with the Mushere. The population size of Mushere people is estimated to be around 37,000 (Nigerian National Population Commission, 2015 projected population) across a total land area of 870.25 km². The main occupation of the Mushere people is agriculture, including various forms of animal husbandry and crop production. The main crops grown by Mushere people include millet, *Pennisetum glaucum* Fonio *Digitaria* sp. (locally called “Accha”), maize *Zea mays*, guinea corn *Sorghum bicolor* sesame *Sesamum radiatum*. Dulu forest is part of a small remaining forest in Mushere land said to belong to the Kaddim communities comprising of Naula, Njemut and Kaddim-kasa (made up of Njemut and Kaddim-Bisa). It covers an area of approximately 40-50 square kilometres and is to the southern-eastern fringe of Mushere land, which harbours vegetation that may have been mainly lowland rainforest type, but presently is predominantly woodland guinea savannah interspersed with gallery or riparian forest and rocky outcrops. It is an area of conservation interest mainly because it is one of the few remaining forests in the state, and it is home to the endemic bird species; the Rock Firefinch *Lagonosticta sanguinodorsalis* and its brood parasite, the Jos-plateau Indigobird *Vidua maryae* and other interesting flora and fauna.

**Figure.1:** Ecological Map showing the study communities and the Dulu Forest (Source: National Remote Sensing Unit, Jos)
**Data Collection**

Semi-structured, open-ended questionnaires were used in data collection. Respondents were drawn from the three Mushere communities Kaban, Naula and Njemut, the communities closest to the Dulu forest. Purposive sampling method was used to find individuals who visited the Dulu and used its resources, and who were willing to participate in the survey, mainly because individuals who had never visited the forest, nor relied on it for their income and sustenance cannot offer any meaningful contributions to the survey.

Respondent selection was dependent on the willingness of individuals to participate in the research. The surveys were conducted at weekends when most of the adults were in the villages. Although the Kaban community is not one of the custodians of the Dulu forest, their closeness to it and their utilization of the forest resources were criteria for their inclusion. The questionnaire had three sections; a section on the demographic information of respondents, the second on general forest knowledge and use, while the third section contained questions of conservation interest.

**Data Analysis**

Data were analysed using descriptive statistics. The responses were coded, and thematic analyses were conducted to classify responses into groups. Non-parametric independent sample tests (Kruskal-Wallis and Mann-Whitney tests) were carried out to determine the differences between the frequencies of responses in the various categories by age, gender and occupation.

**RESULTS**

**Distribution of Respondents**

In all, fifty-three respondents were surveyed, 19 (35.8%) females and 34 (64.2%) males. The age distribution was 18-29 years 16 (30%), 30-49 years 18 (34%) and 50 years above 19 (36%). Thirty-three (62%) were farmers, 12 (23%) were timber operators and eight (15%) were in other occupation types.

**Perceptions of the Forest by Gender:** more men than women (70% of men and 30% women), perceived the forest in terms of timber extraction, but the overall perceptions of the forest were not statistically different by gender (Mann-Whitney Test = 253.50, S. E= 52.38, p > 0.05).

**Perceptions of the Forest by Age:** 85% of respondents who were between the ages of 18-49 years, perceived the forest predominantly in relation to timber extraction, while only 10% of the oldest age category (50 years and above) perceived it in terms of timber extraction. The predominant perception for the oldest age category was related to honey/wild animals (80%). This difference in perception between the younger and oldest category were statistically significant (Kruskal-Wallis test = 6.96, df =2, p < 0.05).

**Perceptions of Respondents Based on Proximity to Forest:** With regards to perceptions of the forest based on respondents’ proximity to forest, all respondents from Naula community reported perceiving the forest as a place for timber extraction, while respondents from Kaban and Naula perceived it differently. The difference in perceptions was therefore statistically significant (Kruskal-Wallis test = 14.28, df =2, p < 0.05).

Lastly, respondents were asked to suggest ways to ensure sustainable utilization and conservation of the forest. Sixteen (30%; 9 men, 7 women) suggested allowing the land to regenerate, 14 (26%; 9 men, 5 women) suggested the creation of a community forest reserve, while nine (17%; 6 men, 3 women) believed laws should be made to regulate the use of the forest and its biodiversity.

**DISCUSSION**

“To understand how people related to their natural environment it would first be essential to understand how people conceptualized that environment...”

-Eugene Hunn 2014

The findings of this study suggested that the key perceptions of the forest were related to timber extraction and land for farming, and these perceptions were mostly age-differentiated. Also, because men reported more visits to the forest mainly for timber extraction, in-depth knowledge of the forest flora at least, might be women’s knowledge (e.g., Voeks, 2007; Guimbo, Mueller, & Larwanou, 2011), while aspects of the ecology of the forest necessary for effective timber extraction might be men’s domain, as the findings revealed that women reported perceiving the forest in terms of its floral composition (trees, wild vegetable and fruits) and the land for farming, than men did, but this is subject to further research.

Age, however was consistently a significant factor in differentiating the perceptions of respondents on the valuing, knowledge and use of the forest, except in the perceptions of changes to the forest, where perceptions did not seem to change significantly with age. The age-related perceptions revealed many ways that each age group viewed and utilized the Dulu forest. The oldest group valued the land more as a resource, while the middle and youngest age groups valued timber more. Contrary to the school of thought that theorizes that older folks are usually less...
interested in contributing towards conservation, this results showed that older Mushere respondents were more interested in the preservation of the forest than the younger respondents. This is an important finding, that supports the observations of previous researchers (e.g., Wiernik et al. 2013), that older individuals tend to perceive the environment more inclusively and positively than younger individuals, mentioning uses of the forest that included its aesthetic values, its provisional uses, and even mentioning the dislike for the destruction going on in the forest as a result of the extraction of timber. Although certain authors have suggested that age is negatively correlated to the willingness to contribute to additional environmental protection (because older people do not usually have much stakes anymore in the results of such activities (Whitehead 1991; Torgler, 2008), this finding did not agree with that assertion. In this study, older respondents were less in support of the destruction than the younger respondents, and were the only group whose main reason for wanting to support conservation was to stop the destruction going on, because they love the forest and wanted to see it improve. The younger age groups on the other hand, were more interested in the economic aspects of the forest, probably because they are the age group who are at the productive stages and have families to care for.

Drivers of forest Change
From the findings of this study, three main drivers of forest change were identified: deforestation due to logging, hunting pressure and population, like the findings of Chan & Sasaki (2014) in Cambodia among the rural poor, where deforestation was driven by illegal logging, among others. One of the crucial requirements of the REDD+ is for countries to identify drivers of forest degradation and deforestation, so that they can develop effective action plans and strategies (Hosonuma et al. 2012). A review of reports by countries on drivers of forest change and degradation by Hosonuma et al (2012) reported that fuelwood/charcoal production and subsistence/commercial agriculture were main drivers in Africa, while commercial agriculture was the main driver in both Africa, Latin America and Asia (see also Houghton, 2012). Understanding local drivers of forest degradation and deforestation is central to overcoming the global challenges associated with forest loss and degradation such as habit loss, species extinctions and climate change. It is also important for developing national/local policies and strategies for mitigation (Boucher 2011; Rudorff et al. 2011).

Hosonuma et al. (2012) also observed that despite the importance of such understanding, empirical data are lacking on drivers of forest change and deforestation, and so drivers of forest change remain unknown, but forest degradation is said to be driven by timber extraction, and logging accounting for about 52% in Latin America and Asia. Data from most African countries are lacking, and the findings of this research, though preliminary, and based on limited data are a contribution to the national data.

CONCLUSION, CONSERVATION AND POLICY IMPLICATIONS OF THESE FINDINGS
‘...solutions must be found in motivating individuals, especially those who actually use the resources, to conserve’. Anderson, E. N. 1996

Three main objectives of this study were to understand the perceptions of the Mushere about the Dulu forest, find out drivers of deforestation and degradation of the forest and find out ways of mitigating it. We argued that without understanding the perceptions of local people about their environment, conservationists might not succeed in developing the best and effective strategies and policies for conservation, since process needs to be participatory and inclusive of local people’s views and knowledge. The perceptions of the Mushere locals about the Dulu forest revealed that the predominant view of the forest was mainly as a site for resource extraction. This view was mainly held by the younger age respondents who are the reproductive age group. Perhaps this is not unrelated to their need for sustenance and maintenance of their families. The perceptions of the resources in the forest revealed that apart from timber, the people also value the land. Gender did not seem to influence perceptions, but age was a significant factor, in differentiating individual perceptions. These two findings have conservation implications, conservationists should seek to understand the perception of various demographic/stakeholders in communities before embarking on projects, in this case, both men and women need to be targeted in the conservation strategy and policy development, but the youngest and the middle-aged groups are key, as they are the most users of the forest and its resources, they therefore should be targeted stakeholders in any decision-making and planning.

The main drivers of the local deforestation of the Dulu was found to be logging activities, driven by the need to improve their socio-economic standing, this might be due to poverty, greed, or both. These two factors have been implicated in the unsustainable use of natural resources by people (e.g., Von der Osten, Kirley & Miller (2017); Wilke 1991).

This finding differed slightly from the drivers of deforestation identified at a regional level, but it a reflection of the national drivers of deforestation in
Nigeria, which include logging, bush burning, and charcoal reduction. Although this result is local, this study contributes to the local and national understanding of the drivers of deforestation. Such local studies provide data which then gives a picture of the national and regional issues of deforestation. Mitigation will require a complex approach. Mahanty et al. (2006) recognized social and political (e.g., family and government connections) assets as vital for the success of any community-based conservation program. In the present case, this might involve understanding the family unit in Mushere and how family responsibilities are structured.

In conclusion, therefore, although the results of this preliminary study come from a small sample size, biased towards forest resource utilizers, we suggest that to successfully restore or protect the Dulu forest, deliberate efforts must be taken to encourage the people’s perceptions of the forest ecosystem to be more positive and encourage a more sustainable outlook, such as encouraging tree planting and other similar activities which will help reduce the effects of deforestation, and ensure the sustainable use of forest natural resources, while working on improving attitudes and perceptions towards resource use through continuous dialogue and education on not only the local consequences of our actions or inactions, but the global effects as well.

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REFERENCES


Ethnobiology Letters, 5: 146-150.


