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UNDERSTANDING THE DRIVERS OF CHILDREN'S NATURE KNOWLEDGE, ATTITUDES AND PERCEPTIONS AND THE IMPLICATIONS FOR THE FUTURE OF NIGERIA'S BIODIVERSITY

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ABSTRACT

This work was aimed at determining the drivers of children's nature knowledge, attitudes and perceptions (KAP) of biodiversity in Plateau State, North-central Nigeria. We used a mixed methods approach in data collection, including interviews, photo displays and semi-structured oral interviews. Simple frequency tests were used in data analyses. Two hundred and ten pupils participated in the study.Results revealed three main drivers of children's nature KAP, these were: 1. the need for sustenance/provisioning. 2. Protection and safety and 3. Fear of the unknown due to a lack of proper knowledge about an organism. Also, indirect nature experiences were the most predominant sources of knowledge (watching television programs and wildlife documentaries (21%), and from reading books 16%). Learning involved a variety of sources including family members, peers and personal interest in nature. We conclude that children's nature KAP is driven mainly by survival, and a deficit of direct nature experiences, and that ignorance, emanating a deficit of nature experiences and a lack of understanding and awareness of the existing local wildlife are major factors driving fear and apathy. We suggest more deliberate, proactive steps that ensure children have direct engagements with nature. Parents, teachers, and schools and indeed every stakeholder need to be more proactive in ensuring that nature education and direct nature experiences are highlighted and deliberately celebrated and taught to children if they are to become effective custodians of our future biodiversity.

Keywords: Drivers of Knowledge, Attitudes and Perceptions (KAP), Children, Nature, Biodiversity.

INTRODUCTION

Are there a general set of behaviours, attitudes, and perceptions that drive people to becoming more environmentally friendly and aware, interested and involved? What are they? These key questions and an understanding of the drivers of nature knowledge are important for the future of biodiversity. In the Nigerian environment, there has been little or no studies geared toward understanding these important socio-ecological aspects of conservation. Elsewhere in Japan, Soga *et al.* (2018) found that children's nature experiences were driven by a child's personal nature relatedness with the major driver being the nature orientation of family members (see also Muderrisoglu & Gultekin, 2013). Also, Otto & Pensini (2017) investigated drivers of eco-behaviour in children and found that a combination of nature knowledge and an individual's connectedness to nature were the two major drivers of a positive nature attitude. They however recommended that more research be carried out on this important area to further understand what drives nature attitudes. Furthermore, Soga *et al.* (2016) investigated drivers of children's willingness to conserve biodiversity. Their research investigated the effects of exposing children to direct nature experiences, and vicarious (indirect) experiences which included reading nature books, watching television, and listening to family members. The results revealed that children's affective attitudes (emotional attachment or feelings)

was the mediator of children's willingness to conserve biodiversity. They also recommended a proactive approach to ensuring children engaged more frequently with nature, so as to increase their affection towards it and hence, their willingness to conserve it. In the United Kingdom, Cameron-Faulkner *et al.* (2018) reported that parents and children that engaged in direct nature experiences had richer biodiversity language than those who engaged with nature indirectly. Their results suggested that having direct nature experiences between parents and children provides the opportunity for learning the language of nature and better prepare children to take on the role of custodians of nature. A similar finding was reported by Tian (2018) who worked with Massai pastoralist children in Kenya.

It is therefore apparent that understanding the drivers of children's nature knowledge is an important aspect of biodiversity conservation, which requires more researching into. We therefore aimed at investigating the main drivers of children's nature KAP in Nigeria so as to contribute to our understanding of this, and also to help policy formulators make informed decisions on the environment based on an understanding of the dynamics of nature perception and knowledge and the drivers of such perceptions and attitudes.

MATERIALS AND METHODS

Study Area

The study was conducted in six Local Government Areas (LGAs) of Plateau State, Nigeria. Plateau is located in Nigeria's Geo-political middlebelt with an area of 26,899 square kilometers. It is located between latitude 08°24'N and longitude 08°32' and 010°38' east. The state is named after the many Plateaus found there. Bare rocks are scattered across the grasslands, which cover the Plateau. The altitude ranges from around 800 m around the south-eastern borders; 1,200 m to a peak of 1,829 m above sea level in the Shere Hills range in Jos (Blench 2003; UNDP 2018). It has a population of over 3.5 million people across the 17 local government area (National Population Commission Census 2006).

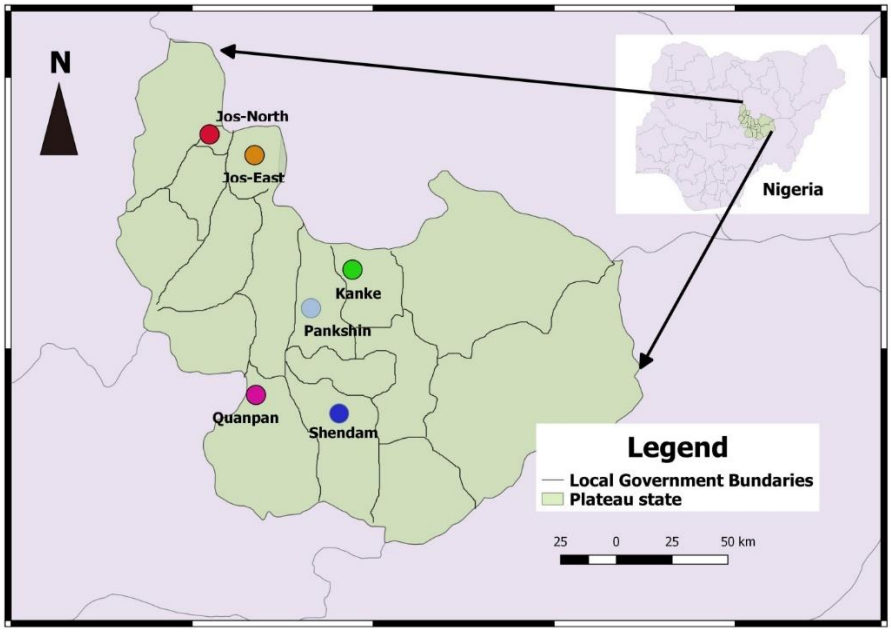

Figure 1: Map of Plateau State showing the Studied LGA

Six Local Government areas from Plateau State, were selected for the study (Jos -East, Pankshin, Shendam, Quan-paan, Mangu and Bassa); two schools in each community (total, 156 respondents), in addition to 10 schools (total 54 respondents) within the city capital, Jos. The major criterion for selection of the village schools was the presence of a nature reserve or forest close to the community; the six geo-political areas of the state were represented. For the city schools, we selected 5 public schools and 5 private schools.

Secondly, we were interested in finding out whether or not city children knew more or less about the natural environment than village children, or verse versa. We used a mixed-methods research approach in data collection involving the use of semi-structured questionnaires, oral interviews, and picture

recognition activities. Consent was sought from different authority figures and children prior to the start of the research, including head teachers. Students were first invited individually to a classroom where the researchers had displayed printed pictures of different animals. Each student was required to go round and touch only the animals he or she disliked, name it, (if they could), and tell the researchers why they disliked the animal. After the picture recognition test, the student was interviewed using a semi-structured questionnaire. The questionnaire had sections for the demographic information of the student, and questions about how they acquire their nature knowledge, the process of acquisition, who they learn from and how. Including other questions that would lead us to arriving at our goal. On the average, the interviews took about 10-15 minutes with each student. The picture recognition tests were used to determine the attitudes and perceptions of children to different animal types. Animals included both local and exotic species of wildlife. The aim of this exercise was to determine attitudes and perceptions to different types of wildlife. There were various variables we included in the tests in order to gain insight into how children gained their nature knowledge, and how they perceived the environment. We considered factors such as the educational backgrounds of their parent (s), Parent's Occupation, who the child was staying with, the environment of the child (village/city), type of school child attends (public or private), activities the child engages in when outside of school, and the types of engagements and activities children get involved with along with other significant adults, and family members.

We also were interested in knowing what animals and plants children knew in their environment, and whether or not these were native or exotics, wild or domesticated. In addition, children were asked about how they gained this knowledge, what and how they perceived different animals they mentioned, if they had any favourite animals, why they considered such animals their favourites, which were disliked and why, and whether they had a pet(s) or not.

RESULTS

On average, twenty children between the ages of 7-15 years old cutting across all primary classes, 1-5, were randomly selected from each school, giving a total of 210 pupils (ninety-seven boys; 46 %, and a hundred and thirteen girls; 53 %).

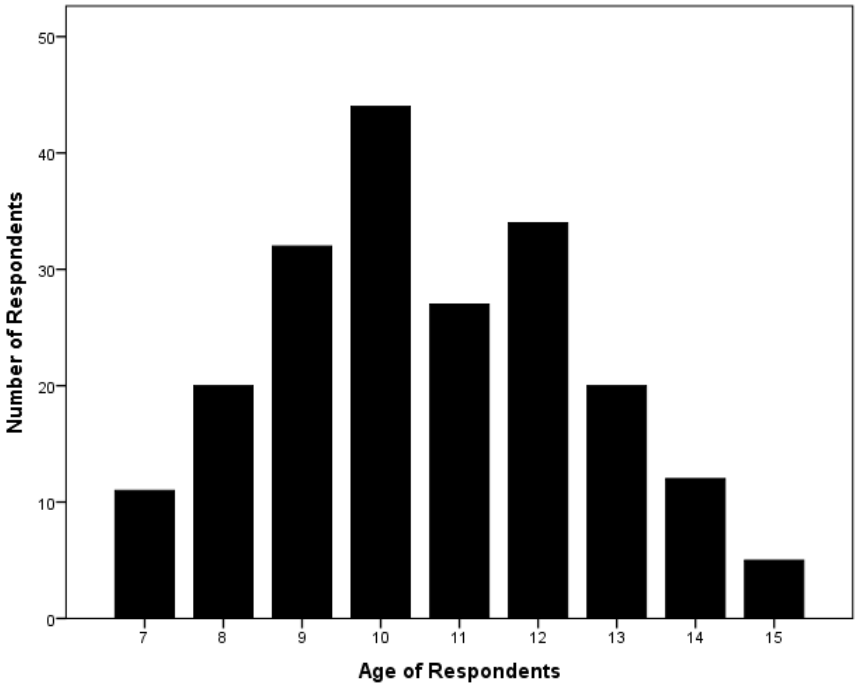

Figure 1: Graph Showing the Distribution of Respondents by Age.

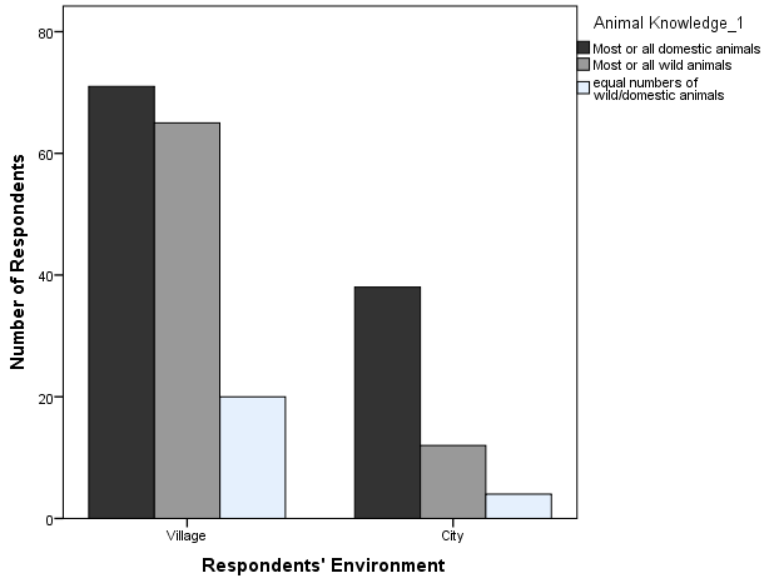

Figure 2: Graph showing Respondents' Animal Knowledge by Environment Type.

Overall, our results revealed that the children held little knowledge about their environment, and there was a similar pattern in the animal knowledge of city children/village children. Both categories mentioned either all domestic animals or more domestic animals than wild animals in their lists (109 respondents 52%) Fig. 2.

Factors such as who children were gaining their motivations and nature knowledge from, the educational background of those adults, their occupations, religious backgrounds, who children stay with, were all not significant drivers of children's nature knowledge . We also found that children were learning more about nature from indirect nature experiences, such as watching television programs and wildlife documentaries (21%), and from reading books (mostly from school 16%). City children reported learning mainly through television documentaries, while village children reported books as their major mode of learning.

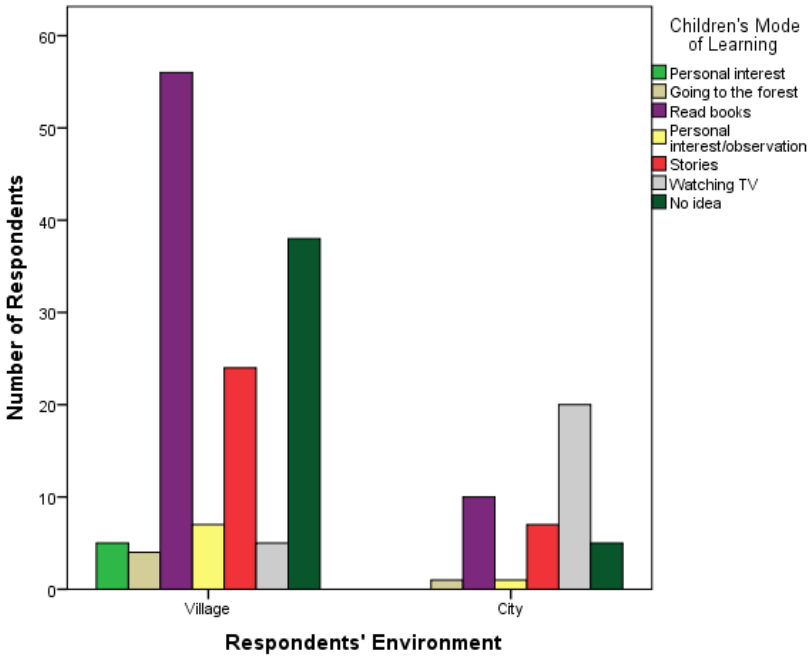

Figure 3: Children's Self-Reported Modes of Acquiring Nature Knowledge.

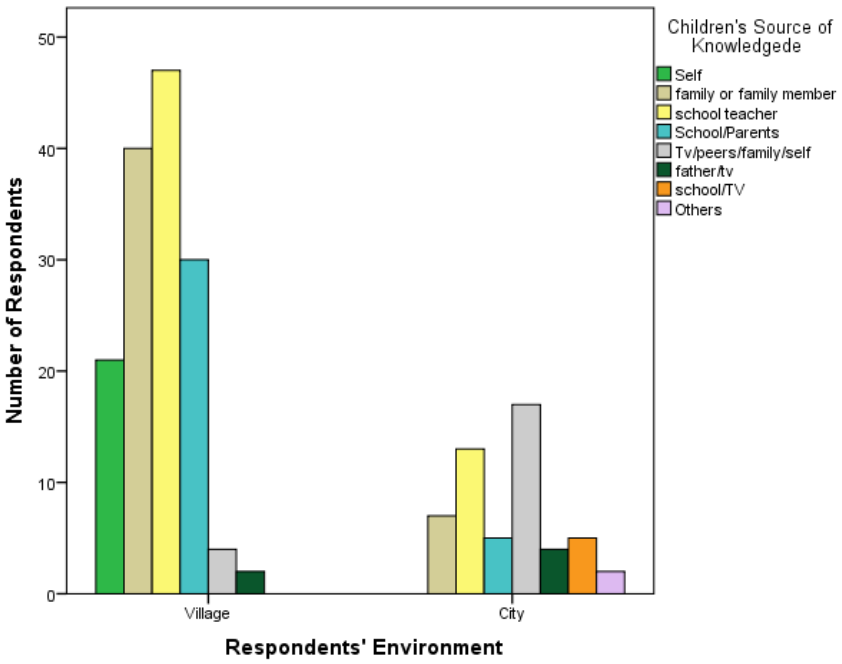

Figure 4: Graph showing Children's Self-Reported Sources of Nature Knowledge

When children were asked to share what animals they perceived were good or not good, reptiles (especially snakes) and other animals perceived to be potentially harmful were considered 'not good' by 57% (n=120) of respondents. While all animals that were perceived to be useful in some way, (mainly those eaten), were considered important by 84.9% (n=174) of respondents.

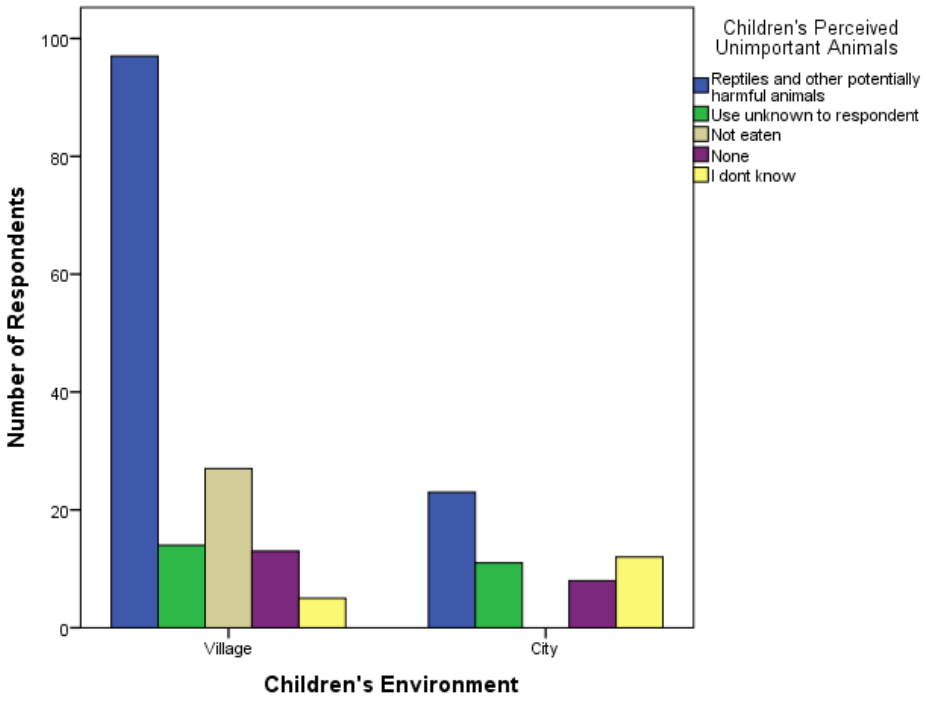

Figure 5: Children's Self-Reported Perceived Unimportant Animals.

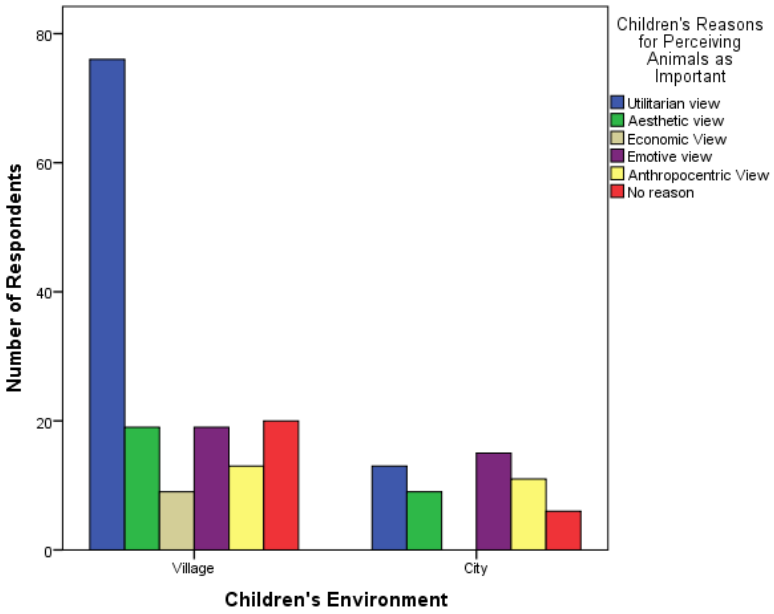

Figure 6: Children's Reported Reasons for Animals Perceived as Important.

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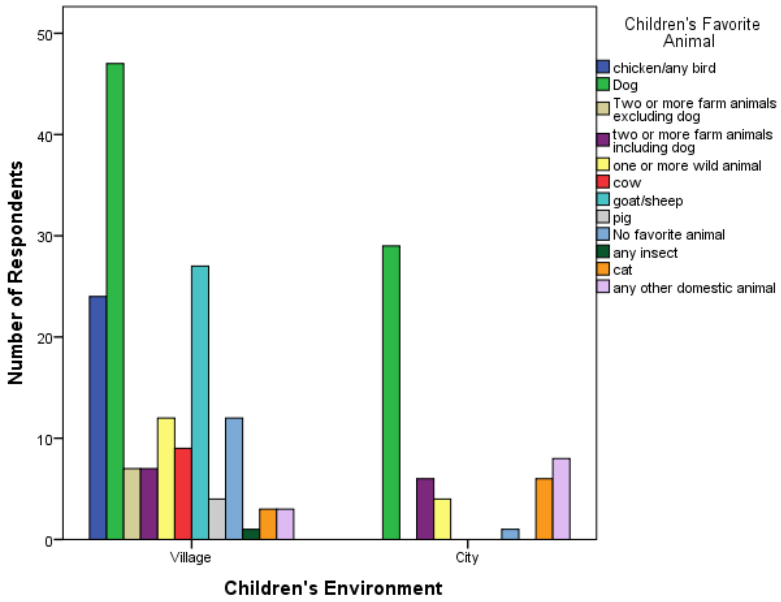

Figure 6: Children's Favourite Animal (s)/Pets.

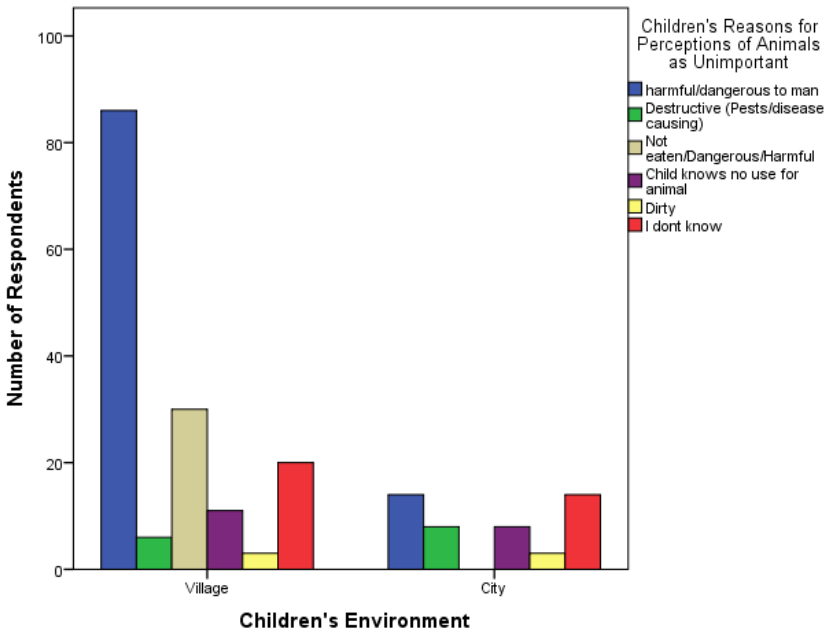

Figure 7: Children's Reasons for Perceiving Certain Animals as Unimportant.

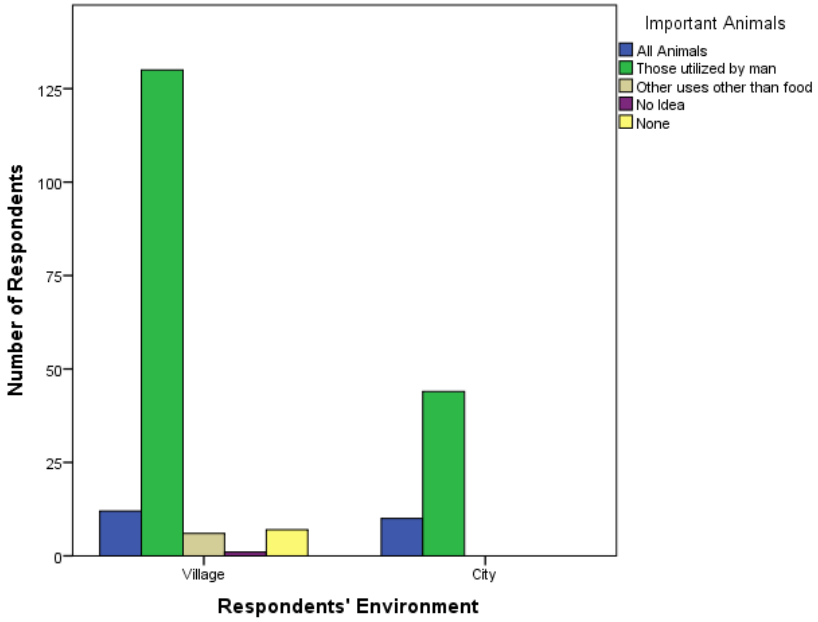

Figure 8: Children's Self-Reported Perceptions of the Value of Various Animals.

We were also interested in finding out children's knowledge about the origins of wildlife. This was useful in understanding the probable cosmological worldviews (foundational beliefs) driving perceptions and attitudes. Forty-seven percent of respondents (n=98) believed that wildlife came from the forest/'bush', followed by the 30 %(n=62) who believed that God made all animals. The remaining either had never thought of that, did not know (10%, n=21) or thought wildlife originated from rocks, zoos, parks etc (n=26, 12%).

DISCUSSION

The worldviews and beliefs of a society/community/people greatly shapes their perceived reality (Soldati and Albuquerque 2016; Boyd and Richerson 2005) . The result on children's understanding of the origins of

life suggests how little discussions around nature and wildlife including their origin might be going on between adults and the children in their care. Also, where utilization of wildlife for sustenance or other human related need is predominant, it would drive the perceptions/behaviour of the people about any specific wildlife in their valuing of that specific wildlife, because as Messoudi (2011) observed, '*behaviour is the performing of information*'. Our findings therefore suggests that utilization, especially for sustenance, and safety from harm were important drivers of children's attitudes towards nature, and this was similar for both city and village children. It is worth noting that any animal perceived to be harmful, or without a known utilization value by children was avoided or 'disliked', meaning that children became less interested in any wildlife they had little or no knowledge of, and hold little or no or experience of. This is similar to the reports of Imai *et al*. (2018) in Japan, whose findings revealed that children developed apathy for any species which they rarely encountered. Janovcová, *et al.* (2019) reported a fear of snakes by their study population, Similarly, Moacyr Xavier Gomes da Silva *et al*. (2021) also reported an aversion for snakes by students of both elementary school and university (see also, Stankova *et al.* 2021), both of these studies found similar reactions to reptiles as our results also showed.

Dogs were the most mentioned animals children liked, and reported as pets. Their reasons for valuing dogs were mainly because dogs serve as guards and offer some level of security to their owners. This result revealed that the perceived utility value of a species drives how it is viewed and accepted by children. This finding is a direct reflection of our findings in our previous work among adults (see Pam *et al.* 2018). This further shows how children mirror the attitudes and perceptions of their family members (family member's nature orientation- Soga *et al.* 2018) or adults in their communities. There is increasing empirical evidence of the effect of nature on children's overall wellbeing and their perceptions and improved attitudes towards nature Kuo *et al.* (2019).

This study has further provided information on how societal nature orientation, especially at the family level is strongly correlated to how children eventually view and relate to nature. With the increasing poverty levels in Nigeria (see World Bank Poverty Country Ratings 2020, with Nigeria being one of the 5 countries housing the largest number of poor people), it is easy to see why survival would be a major driver of children's nature KAP. If Nigeria's biodiversity is to be preserved and sustained, there is a need to actively improve the lives of people, especially children. In Pam *et al.* (2018), we reported that boys tended to hold more direct nature experiences than girls, but that hunting wild birds for food was a major activity. We had initially hypothesized that a lack of deliberateness on the part of adults in having direct nature experiences was a major driver. We were also not ignorant of the fact that poverty was one reason why people were less interested in deliberately experiencing nature. What we did not expect, however, was that children's perceptions and attitudes were already strongly affected and driven by this mentality. Until children are encouraged to appreciate nature for its intrinsic value, this perception of nature as purely a resource for meeting our needs would be carried into adulthood, such that biodiversity will continually be regarded as less important and as resource only for utilization. This same mind-sets would be transferred subsequently to future generations of children. There is therefore an urgent need to re-educate not only children but adults about the true value of biodiversity. This education would have to be holistic, such that both the intrinsic and extrinsic values nature holds are recognized, and the value of people in nature as a part of biodiversity is also emphasized. The fear and apathy resulting from a lack of adequate knowledge and exposure to wildlife can be mitigated through encouraging nature-based teaching and direct nature experiences, and highlighting the value of nature-based solutions (NbS) early in children's education. Although having indirect nature experiences have its use, evidence points to the value of direct nature experiences as being more impactful in shaping children's nature attitudes.

In helping to improve children's nature knowledge and appreciation, species that have been culturally 'blacklisted' such as those with negative cultural associations e.g., Owls, vultures, bats, some reptiles, and many insect species which are believed to only be pests need to be positively highlighted. Children need knowledgeable mentors who will actively and

deliberately feed their natural curiosity and attraction to wildlife and nature. Schools need to embrace environmental/conservation education in their curriculum.In teaching children about nature, teachers and trainers might need to constantly be aware of these three limiting factors working in the subconscious of children, and strategically/deliberately work toward influencing children's acceptance and openness to learning about different groups of animals and plants. They will need to work out ways in which they can help children to begin to think differently about organisms beyond these three major driving factors reported in this findings. Child psychologists, anthropologists, educators etc. need to work together, each bringing perspectives that will help in effectively teaching children about their environment, after all, conservation is everybody's business.

Furthermore, adults also would need to deliberately go for informed knowledge of their environment/wildlife, be open and objective in learning new things, be willing to let go of untested/unverified beliefs and practices, and embrace scientifically proven facts about different animals and plants. In other words, only when the adult attitude and perceptions improve or change, will we be effective trainers of our children in this regard. Results from this study would help in informing, and guiding practitioners at various levels, who work with children, to be more strategic and deliberate in the way and manner they develop, and deliver contents as we strongly believe that these drivers/factors, reported here have been major players in delaying or hindering the desired outcomes of the many conservation initiatives and projects that have constantly toiled to improve the biodiversity situation in Nigeria. Policy makers could also benefit from the findings here, as they formulate policies that help protect our biodiversity especially as it relates directly to the United Nation's Sustainable Development Goals 2023 (goals - 13 climate action; 14 Life below water; 15 Life on land).

Lastly, since values and beliefs drive peoples' attitudes, it is important to understand how the key societal values influence conservation attitudes among children. This understanding will serve to guide policy and practice as children are engaged in conservation activities and thoughts.

CONCLUSION

In conclusion, there is a serious need for all stakeholders to become even more deliberate in working to ensure that Nigerian children are knowledgeable about their natural environment, by creating oppurtunities for outdoor nature experiences and learning. We need to be more deliberate about creating safe, green spaces in neighbourhoods, such as parks and gardens where nature can thrive and children can play I, and learn about their natural environment. Schools in particular have an opportunity to create natural spaces for outdoor learning while children are in school. If this is not proactively done, the future of biodiversity in Ngeria would continue to look bleak, and the future might turn out worse than we have at the moment. We can work to change that narrative by engaging more children in nature education.

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Conflicts of interest

We declare no conflicts of interest.

REFERENCES

Boyd R, Richerson, P. J. (1985) Culture and the Evolutionary Process. The University of Chicago Press, Chicago, USA

da Silva, M., Braga-Pereira, F., da Silva, M. C., de Oliveira, J. V., de Faria Lopes, S., & Alves, R. (2021). What Are The Factors Influencing the Aversion of Students Towards Reptiles?. *Journal of Ethnobiology and Ethnomedicine*, 17(1), 35. https://doi.org/10.1186/s13002-021-00462-z Accessed 31st May 2021

Ehrlich, P.R. (2002): Human Natures, Nature Conservation, and Environmental Ethics. *Bioscience 52* (1): 31-43

Evans, GW, Barbara, J., Victor, C-V., Josea, C.and Florian G.K. (2007). Children's Cross-Cultural Environmental Attitudes and Self-Reported Behaviours. *Children, Youth and Environments 17(4): 128-143.*

Gallois, S., and Reyes-García, V. (2018): Children and Ethnobiology. *Journal of Ethnobiology 38(2):* 155–169

Soldati, G.T., & Alburquerque, U.P. (2016): Are the evolutionary implications of vertical transmission of knowledge conservative? *Ethnobiology and Conservation 2016, 5:2 (30 June 2016) doi:10.15451/ec2016-6-5.2-1-09*

Mesoudi A (2011) Cultural Evolution: how darwinian theory can explain human culture, synthesize the social sciences. The University of Chicago Press, Chicago, USA

Muderrisoglu, H. & Gultekin, P. G. (2013): Understanding the children's perception and preferences on nature-based outdoor landscape**.** *Indoor and Built Environment 24 (3)::10.1177/1420326*

Janovcová, M., Rádlová, S., Polák, J., Sedláčková, K., Peléšková, Š., Žampachová, B., Frynta, D., & Landová, E. (2019). Human Attitude toward Reptiles: A Relationship between Fear, Disgust, and Aesthetic Preferences. *Animals : an open access journal from MDPI*, *9*(5), 238. https://doi.org/10.3390/ani9050238 Acessed 31st May 2021

Imai, H.,Nakashizuka, T. and Kohsaka, R. (2018): An Analysis of 15 Years of Trends In Children's Connection With Nature and Its Relationship With Residential Environment. Ecosystem Health and Sustainability, 4:8, 177-187, DOI: 10.1080/20964129.2018.1511225

Kuo M, Barnes M and Jordan C. (2019): Do Experiences With Nature Promote Learning? Converging Evidence of a Cause-and-Effect Relationship. Front. Psychol. 10:305.doi: 10.3389/fpsyg.2019.00305

Manfredo, M.J., Bruskotter, J. T., Teel, T. L., Fulton, D., Schwartz, S., H., Arlinghaus, R., Oishi, S., Uskul, A. K., Redford,K., Kitayama,S., and Sullivan, L. (2016): Why Social Values Cannot Be Changed For the Sake of Conservation. *Conservation Biology 31 (4): 772-780*

Otto, S. and Pensini, P. (2017): Nature-Based Environmental Education of Children: Environmental Knowledge and Connectedness To Nature, Together, Are Related To Ecological Behaviour. Global Environmental Change 47:88-94 DOI: 10.1016/j.gloenvcha.2017.09.009

Tian, X. (2018): Generating Pastoral Skills through Work and Play in the Daily Life of Maasai Children in Kenya. *Journal of Ethnobiology*, 38(2): *170–186*

Soga, M., Gaston, K.J., Koyanagi, T. F., Kurisu, K., and Hanaki, K. (2016): Urban residents' perceptions of neighbourhood nature: Does the extinction of experience matter? *Biological Conservation (203): 143-150*

Soga, T., Yamanoi, M., Tsuciya, K., Koyanagi, T. & Kanai, T. (2018): What Are the Drivers of, and Barriers To Children's Direct Experiences of Nature. *Landscape and Urban Planning 180: 114-120 DOI: 10.1916/j.landurbanplan.2018.08.015* Accessed 23/5/2021

Stankova, H. Janovcova, M., Pelescova, S.,Sedlackova, K.,, Landova, E. and Frynta, D. (2021): The Ultimate List of the Most Frightening and Disgusting Animals: Negative Emotions Elicited by Animals in Central European Respondents. *Animal (Basil) 1 (3): 747Doi: 10.3790/ani11030347 Accessed 31st May 2021*

Schultz, P. (2002): Environmental Attitudes And Behaviours Across Cultures. *Online Readings in Psychology and Culture,8(1).* https://doi.org/10.9707/2307-0919.1070

Pam, G, Zeitlyn, D, and Gosler, A. (2018a). Ethno-Ornithology of the Mushere of Nigeria: Children's Knowledge and Perceptions of Birds. *Ethnobiology Letters* 9: *48-64*

Pam, G, Zeitlyn, D, and Gosler, A. (2018b). Perceptions of the Mushere People on the Dulu-Forest: Implications for Conservation. *Proceedings of 6th NSCB Biodiversity Conference; Uniuyo 2018: 19-22.*