

# **Final Evaluation Report**

Your Details	
Full Name	Williams Michael Manja
Project Title	Assessing Vulture Population Status, Trends, Distribution, and Chemical Threats Across Nigeria through Spatial Modelling and Environmental Contaminant Analysis.
Application ID	42165-2
Date of this Report	26/02/2025



**1.** Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.

Objective	Not achieved	<b>Partially</b> achieved	Fully achieved	Comments	
	-		1		
Assess the current population status, distribution, and trends of vultures across Nigeria. This involves conducting field surveys (Road transect and point counting) collecting data on vulture sightings, and integrating this information with existing datasets to create a comprehensive picture of vulture populations in the country			Fully Achieved	We were able to assess the current status of vultures using Road transect and point counting in 6 geo-ecological regions of Nigeria.	
Investigate the impact of environmental contaminants on vulture populations. This was achieved by analyzing fallen vulture feathers for the presence of chemical pollutants and other contaminants, and correlating this data with vulture population trends and distribution patterns.			Fully Achieved	We successfully collected feather samples and carried laboratory analysis to determine the contaminants affecting vultures across Nigeria.	
Conducted ethno- ornithological study to determine the traditional believes useful or otherwise in conservation of Vultures in different communities across			Fully Achieved	We used questionnaires and, interviews to find out the traditional beliefs in different regions of Nigeria which affect the vultures or is helping their population in Nigeria.	



Nigeria			

#### 2. Describe the three most important outcomes of your project.

**a**). We observed a near-complete absence of vultures in states like Kano and Ekiti. In other regions, such as Anambra, Plateau and Taraba states, significant declines were evident, with only a few individuals remaining. However, Cross River State emerged as a relatively stronghold, with a higher abundance of vultures. The findings of this study reveal a distressing decline in vulture populations across Nigeria. We did not find any free living live vulture in Kano, and Ekiti states.

# b). The following outcomes were found concerning contaminants affecting vultures in Nigeria:

**1.** Arsenic Contamination: Arsenic (p = 0.0571) was the most concerning contaminant, showing a strong negative correlation (-0.622) with vulture abundance, particularly in Serti Gashaka and Jalingo, where concentrations were highest (5.6 ppm).

2. Mercury and Magnesium: Mercury displayed a moderate negative correlation (-0.285) with vulture abundance but was not a significant predictor (p = 0.09), while magnesium, though essential, showed a moderate negative correlation (-0.309) and potential detrimental effects on vultures.

3. Cadmium and Chromium: Cadmium (p = 0.0076) had an unexpected moderate positive correlation (0.490) with vulture abundance, while chromium (p = 0.0045) also showed a moderate positive correlation (0.399), suggesting complex ecological interactions.

4. Lead and Other Metals: Lead levels were low (0.41 ppm) with a weak negative correlation (-0.068), contradicting previous studies, while nickel, copper, and zinc showed negligible influence on vulture populations.

5. Geographical Variation: Cross River State remained a stronghold for vultures due to cultural protection, while Taraba had moderate numbers, with the highest contaminant levels recorded in Serti Gashaka and Jalingo.

6. Conservation Implications: The study highlights the significant role of environmental contaminants, particularly arsenic and mercury, in vulture declines, emphasizing the need for pollution control to protect both wildlife and human health.

c). Some beliefs or taboos have positive impact on the protection of vultures in South-south states of Nigeria, especially in Cross Rivers state and this reveal the needs to spread such important traditional beliefs among other communities. In the North and Western parts of the country, most of the beliefs concerning vultures were negative and threaten them, causing their decline.



## 3. Explain any unforeseen difficulties that arose during the project and how these were tackled.

a. We faced some security (near kidnapping incidence) on our way to one of the survey points within Ekiti state, in Western Nigeria. However, we escaped unharmed. Secondly, the sudden 100% increase in fuel or pump prices in Nigeria and the consequential increase in cost of livings.

Impact of Inflation on Project Budget and Measures Taken

b. The initial budget for this vulture conservation project was planned based on the economic realities of 2023 (year of grant application). However, Nigeria's inflation rate surged from 24.66% in 2023 to 34.80% by December 2024, significantly reducing the purchasing power of our funds and increasing operational costs.

# **Challenges Faced**

The rising cost of goods and services posed severe financial constraints:

- i. Feeding: The cost of basic food items more than doubled, making it difficult to sustain field teams without budget adjustments.
- Accommodation: Lodging prices increased drastically, affecting the ability to ii. secure safe and suitable housing during fieldwork.
- Transportation: Fuel price hikes and currency devaluation led to steep iii. increases in transport costs, limiting mobility for surveys and sample collection.
- Other Services: Laboratory analysis, internet connectivity, and logistics iv. became significantly more expensive, straining resources for data collection and analysis.

# **Overcoming These Challenges**

To mitigate the impact of inflation and ensure project continuity, we sought and secured additional funding from the AGNES-BAYER Science Foundation Research Grant. This funding not only helped cover increased expenses but also helped us to recruit more field assistance and expanded the project's scope to include:

Road-transect surveys for a broader assessment of vulture populations.

Ethno-ecological studies to explore community perceptions and conservation challenges.

Conservation outreaches and education to sensitize on co-existing with vultures in some of the communities that are the strongholds for vultures.

By that, we successfully navigated inflationary pressures while strengthening our research and conservation efforts, ensuring continued impact despite economic uncertainties.

NB: Because of the expanded scope of the project and the different perspectives the research focused on, the results of the research are sent to three different peer review journals for publications. In all our dissemination efforts, including scientific publications, conference presentations, and community engagement activities, we



ensured that the contributions of Rufford and the AGNES-BAYER Science Foundation are clearly and gratefully acknowledged. We believe in transparent and respectful recognition of our funding partners.

# 4. Describe the involvement of local communities and how they have benefitted from the project.

Local communities have been at the heart of this project, playing important roles in vulture conservation efforts. Their involvement has not only contributed to the success of our research but has also brought tangible benefits to them.

### **Community Participation in Research and Conservation**

**Community Volunteers & Local Guides**: We engaged local hunters, farmers, and youth as field assistants and guides during road transects and ethno-ecological studies. Their deep knowledge of the landscape and wildlife behaviour was invaluable in tracking vulture populations and identifying key habitats.

Traditional Knowledge Integration: Through interviews and focus group discussions, community elders and traditional leaders shared insights on historical vulture populations, cultural beliefs, and potential threats. This helped shape conservation strategies that align with local customs.

**Capacity Building & Awareness Programs**: We conducted workshops and outreach programs in schools and community centres to educate locals on the ecological importance of vultures, their role in waste management, and the dangers of illegal wildlife trade.

By hiring community members as research assistants, we provided short-term employment, boosting local livelihoods and training them in conservation of vultures.

**Education & Skill Development**: Community members gained knowledge about vulture conservation, sustainable environmental practices, and research methodologies, empowering them to take active roles in conservation initiatives.

Enhanced Ecotourism Potential: As awareness grows, there is increased potential for birdwatching tourism, which could provide long-term economic benefits to the communities.

**Human-Wildlife Conflict Mitigation**: By engaging farmers, hunters and some students in conservation discussions, we have promoted a better understanding of how vulture conservation ties into broader ecosystem health and sustainable livelihoods.

#### 5. Are there any plans to continue this work?

Yes, this project revealed the needs in different communities which are key towards population increase of the vultures.

Building on the progress made, we plan to expand our conservation outreach and education efforts in communities identified as strongholds still harbouring significant vulture populations. Our goal is to promote coexistence between humans and vultures while addressing key threats to their survival.



#### **Key Future Actions**

Community-Based Conservation Programs: We will work closely with local communities to develop conservation strategies that integrate traditional knowledge with scientific approaches.

Expanded Education & Awareness Campaigns: Schools, religious groups, and local associations will be engaged in tailored educational programs highlighting the ecological importance of vultures and the dangers of poisoning and illegal wildlife trade.

**Training of Vulture Guardians**: Selected community members will be trained as "Vulture Guardians" to monitor populations, report threats, and serve as conservation ambassadors in their regions.

**Sustainable Livelihood Initiatives**: To reduce dependence on harmful practices (e.g., poaching, trade in vulture parts), we will explore alternative livelihood support for local communities, such as ecotourism opportunities and agroforestry initiatives.

Policy Advocacy & Stakeholder Engagement: We plan to collaborate with local governments, conservation organizations, and policymakers to strengthen legal protections for vultures and enforce anti-poisoning measures.

### 6. How do you plan to share the results of your work with others?

I have already prepared one of the manuscripts and it is already sent to the Journal of African Ornithology (OSTRICH) towards publication to enable it to reach the scientific readers. Another manuscript is already being prepared for publication in another international peer review journal. More so, I already presented the outcome of the research at a national conference of Wildlife Society of Nigeria (WISON) in Kano State, Nigeria. I have had some interview sessions with some international conservation journalists, example "Monogabay." I have also shared the research outcome on my social media handle; LinkedIn, Facebook and blog. I will be presenting the outcome at the academic post graduate presentation in Joseph Sarwuan Tarka University (Formally, Federal University of agriculture, Makurdi). The outcome is also due to be shared with the local newspaper (The standard and Punch in Nigeria). I believe that sharing these outstanding findings with international experts, local people and the media will increase the awareness on the conservation of vultures.

#### 7. Looking ahead, what do you feel are the important next steps?

Monitoring of vulture population and promotion of co-existence with vultures in their already identified strongholds across the country in collaboration with local community volunteers, is the next steps. This project has highlighted critical needs in various communities that are essential for supporting vulture population recovery. Moving forward, we plan to expand our conservation outreach and education efforts, particularly in stronghold communities where vultures still thrive. By promoting coexistence between humans and vultures, and also monitoring the vulture population periodically, we aim to mitigate threats and ensure long-term population stability. Strengthening community engagement and addressing key conservation challenges will be vital steps in securing a sustainable future for vultures in Nigeria.

# 8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?



Yes, I used The Rufford Foundation logo on customized field T-shirts used during surveys in some communities and also during some conservation education. Rufford Foundation received publicity through media coverage, where I acknowledged its support. Additionally, I have included an acknowledgment of Rufford in the manuscript submitted for publication in the peer-review international journal, as well as in presentations at academic forums.

### 9. Provide a full list of all the members of your team and their role in the project.

As the team leader, I was responsible for overseeing the entire vulture survey, including the investigation of chemical contaminants affecting them. I coordinated the research design, supervised data collection, and ensured that the project objectives were met efficiently.

Mr. Yeke Titus served as the field expert, contributing his extensive experience in ornithology and raptor studies. His role involved measuring environmental parameters around vulture sites, corroborating vulture counts, and ensuring the accuracy of environmental data collected. His background in wildlife research and his expertise in fieldwork played a important role in strengthening the project's data.

Mr. Andrew Bibu worked as a field assistant, leveraging his experience in tracking vulture roosting and foraging sites. His knowledge of vulture identification and site investigations, gained through his previous work with Biota Conservation Hub Foundation, was instrumental in locating key vulture habitats and collecting fallen vulture feathers for analysis.

Mr Kevin Eyos contributed significantly to road count and point count surveys. As a local from Cross River state and a trained conservationist, he played a key role in identifying vulture strongholds and engaging local communities through conservation education efforts.

Mr. Bamidele Joseph, a trained field ecologist, was responsible for survey activities in the South-Western states, particularly in Ekiti. His local knowledge facilitated smooth interactions with community members and the identification of important survey sites. He also led efforts in conservation education and ethno-ornithological studies, examining traditional belief systems that impact vultures.

Mr. Philibus Audu served as the local field assistant in Plateau State. He actively participated in road count and point count surveys, assisting with data collection. Additionally, he supported the team by occasionally driving the hired Hilux van during road transects, ensuring smooth mobility between survey locations.

#### **10.** Any other comments?

The data collected during this project has highlighted the urgent need for continued conservation action. We are eager to build upon this work, focusing on community engagement and education to ensure the long-term sustainability of vulture populations. We believe that by working closely with local communities, we can create a future where humans and vultures coexist harmoniously.