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# From Tradition to Sustainability: Indigenous Environmental Services in Boki Forest Communities in Cross River State.

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**Abstract**
This study investigates the role of indigenous environmental knowledge and community participation in promoting the sustainability of forest resources in Boki Local Government Area, Cross River State, Nigeria. Anchored in a survey research design, the study explores how traditional ecological practices and collective stewardship contribute to forest conservation in one of Nigeria's most biodiversity-rich regions. Guided by two hypotheses, the research examined the influence of indigenous environmental knowledge and community participation on forest sustainability. A purposive sample of 280 respondents, comprising elders, local leaders, farmers, hunters, and gatherers from selected Boki communities, participated in the study. Data were collected using a validated 20-item questionnaire, with reliability coefficients ranging from .77 to .89. Pearson Product Moment Correlation was employed for data analysis. The findings reveal a statistically significant relationship between indigenous environmental knowledge and forest sustainability, confirming its critical role in maintaining ecological balance and biodiversity. Additionally, a weak but positive correlation was observed between community participation in indigenous practices and forest sustainability, suggesting that collective involvement enhances conservation outcomes. The study concludes that traditional environmental practices remain vital for effective forest management and should be preserved and integrated into contemporary conservation frameworks. It recommends the formal recognition of indigenous knowledge in environmental policies and the strengthening of community-based forest management structures to ensure long-term ecological sustainability.
**Keywords:** Indigenous knowledge, forest sustainability, community participation, traditional practices, Boki, Cross River State

## Introduction and Background

The pursuit of sustainable development increasingly emphasizes the need to integrate indigenous knowledge systems into modern environmental management frameworks. Indigenous communities, especially those located in ecologically sensitive regions, have long engaged in sustainable practices that have contributed to biodiversity conservation, climate change mitigation, and ecological balance. However, much of this traditional knowledge

remains marginalized in contemporary environmental discourse and policy (Berkes, 2018). This study seeks to explore the role of indigenous environmental services in the Boki forest communities in Cross River State, Nigeria, and their potential to contribute to sustainability goals in the face of modern environmental challenges.

Boki Local Government Area, located in the southeastern region of Nigeria, is home to one of the most biologically diverse landscapes in West Africa. The area is part of the larger Cross River National Park, which is known for its rich flora and fauna, some of which are endemic to the region (Adetola & Adetoro, 2014). For centuries, the Boki people have maintained a close relationship with the forest, incorporating traditional ecological knowledge into their everyday practices. Indigenous environmental services in these communities include sacred forest protection, controlled hunting, sustainable harvesting of non-timber forest products (NTFPs), and shifting cultivation (Nneji, Adeola, Adedeji, Olatunde, Onadeko, Eniang, & Olory, 2021). These practices have not only supported the livelihoods of the Boki people but also ensured the sustainability of the forest ecosystem.

The traditional ecological knowledge of the Boki people, often passed down through generations, includes an understandings of species preservation, forest regeneration, and land management techniques that are deeply intertwined with their cultural and spiritual beliefs (Ogar, 2023). Such practices contribute to the maintenance of ecological integrity and resilience in the face of changing environmental conditions. However, despite their importance, these traditional environmental services are increasingly threatened by external pressures such as deforestation, illegal logging, and the expansion of agricultural activities, including the encroachment of monoculture plantations (Adeniyi, 2021). These activities often disregard the sustainable principles embedded in indigenous practices, thereby threatening both the environment and the livelihoods of the Boki communities.

Furthermore, national and state-level conservation policies often fail to acknowledge the role of indigenous communities in environmental stewardship, focusing instead on top-down approaches that are sometimes at odds with local practices (Berkes, 2018). This disconnect has led to conflicts between conservation authorities and local communities, with the latter feeling marginalized in the decision-making processes that affect their land and resources. As a result, the challenge of integrating traditional environmental knowledge into contemporary sustainability frameworks remains a significant issue in the governance of natural resources (Shiva, 2016).

This study seeks to document and evaluate the indigenous environmental services in the Boki forest communities, with the aim of assessing their relevance to contemporary sustainability challenges. By examining the resilience and adaptation of these traditional practices, the research will contribute to the understanding of how indigenous knowledge can inform modern environmental policies and practices. The study will also explore the potential for fostering a more inclusive approach to conservation that respects and incorporates indigenous knowledge into mainstream sustainability efforts (Carm, 2014).

**Indigenous Environmental Knowledge and Sustainability of Forest Resources**

Indigenous environmental knowledge (IEK) is widely recognized for its critical role in the sustainable management of forest resources, particularly in areas where local communities have maintained a close relationship with the environment for centuries. Numerous studies have documented how IEK, rooted in traditional ecological practices, has contributed to the long-term conservation of biodiversity and the sustainability of forest ecosystems (Berkes, 2018). In forest-dependent communities, traditional knowledge systems are passed down through generations, providing crucial insights into the sustainable use of natural resources, including the preservation of endangered species and the management of forest regeneration processes (Shiva, 2016).

In Cross River State, including the Boki communities, indigenous environmental knowledge has been fundamental in managing forest resources. Research by Rawat and Lakra (2025) highlights that traditional forest management practices, such as the establishment of sacred groves and the imposition of seasonal hunting bans, are integral to forest conservation. These practices, based on local ecological knowledge, help to regulate resource use and prevent over-exploitation, ensuring that forest resources are available for future generations. For instance, in Boki communities, the spiritual and cultural connection to forests has influenced the protection of specific areas considered sacred, preventing unauthorized logging and over-hunting (Anaka & Edawa, 2019).

Despite the importance of IEK, Berkes (2018) emphasizes that its integration into formal conservation policies remains limited. National and state conservation strategies often prioritize scientific knowledge and top-down management approaches, neglecting the local knowledge systems that have been proven to support sustainable resource management. This disconnects between indigenous practices and modern conservation policies can undermine the effectiveness of environmental management efforts and disrupt the delicate balance between community-based knowledge and policy implementation (Ruiz-Mallén & Corbera, 2013).

In addition, the declining transmission of IEK to younger generations poses a significant challenge to the sustainability of forest resources. As modernization and urbanization influence the lifestyles of indigenous populations, younger members of the community may become disconnected from traditional environmental practices (Shiva, 2016). This generational shift could lead to the erosion of indigenous knowledge and a subsequent decline in the sustainability of forest management practices in Boki communities.

## Community Participation in Indigenous Environmental Practices and Sustainability of Forest Resources

Community participation plays a pivotal role in the sustainability of forest resources, particularly in indigenous communities where environmental stewardship is often collective. Active involvement of community members in forest management ensures that conservation practices are locally accepted, culturally appropriate, and more likely to be successfully implemented. Studies across Africa, including Nigeria, have demonstrated that community-based natural resource management (CBNRM) has significantly contributed to the sustainability of forest ecosystems (Berkes, 2018).

In Boki communities, participation in indigenous environmental practices such as communal hunting, forest regeneration, and the collection of non-timber forest products (NTFPs) has fostered a shared sense of responsibility for forest conservation. According to Brown and Lassoie (2010), these communal practices are rooted in collective decision-making, where all members of the community are involved in the management and regulation of forest resources. This approach ensures that forest resources are used sustainably and that over-exploitation is avoided. For instance, certain species may be off-limits for hunting during breeding seasons, or specific areas of the forest may be closed to harvesting during certain periods to allow for regeneration (Snyder, 2020).

A key benefit of community participation in environmental practices is the ability to adapt traditional knowledge to modern challenges. Duguma, Atela, Minang, Ayana, Gizachew, Nzyoka and Bernard (2019) argue that when communities are actively involved in environmental management, they are better equipped to address emerging issues such as climate change and deforestation. In the case of the Boki communities, this participation has led to the adaptation of traditional practices, such as the establishment of new protected areas and the reinforcement of forest conservation through community patrols (Takon & Amalu, 2013).

However, challenges to effective community participation remain, particularly in the context of external pressures such as government policies and development projects that may not align with local conservation priorities. Studies by Shiva (2016) and Berkes (2018) show that external interventions often undermine community-based management, either by disregarding indigenous knowledge or by imposing top-down management strategies that conflict with local practices. In Boki, for instance, large-scale agricultural expansion and illegal logging have created tensions between local communities and external stakeholders, making it difficult to maintain sustainable forest management practices (Krause, Nielsen, Guia-Diaz, Lehsten, Olsson & Zelli, 2019).

Moreover, the diminishing participation of younger generations in traditional environmental practices, as noted by Shiva (2016), further complicates efforts to sustain forest resources. The younger generation's increasing migration to urban areas and the adoption of modern lifestyles reduces the pool of community members who are actively engaged in the protection and management of forest resources.

## Statement of the Problem

The Boki forest communities in Cross River State, Nigeria, possess a rich history of traditional environmental services that have contributed to the sustainability of their local ecosystems. These indigenous practices, which include sacred forest protection, sustainable harvesting of non-timber forest products (NTFPs), and shifting cultivation, have ensured the resilience of the forest ecosystem for generations. However, these traditional environmental services are increasingly under threat due to external pressures such as deforestation, illegal logging, agricultural expansion, and the encroachment of modern development activities (Fadare & Obiora, 2020). Despite their importance in maintaining ecological balance and supporting local livelihoods, the role of indigenous environmental services is often overlooked in national conservation policies and development strategies (Berkes, 2018).

As global awareness of sustainability grows, there is a pressing need to examine how traditional ecological knowledge can be integrated into modern environmental management frameworks. Yet, in Boki, the continuity of traditional environmental services faces significant challenges. The disregard for indigenous knowledge in conservation policies, coupled with the dominance of top-down approaches to environmental management, has led to conflicts between local communities and conservation authorities (Shiva, 2016). Additionally, external interventions, such as monoculture plantations and large-scale agricultural projects, often undermine local practices that have contributed to forest conservation and sustainable resource use.

The gap in knowledge concerning the resilience of indigenous environmental services and their potential to contribute to sustainable development frameworks in the region has created an urgent need for research. There is a lack of comprehensive documentation and analysis of the traditional practices in Boki and how they align with contemporary environmental sustainability goals. Furthermore, it remains unclear how these indigenous practices can be effectively integrated into current environmental policies to promote sustainable development while respecting local cultural and ecological knowledge.

This study seeks to address these gaps by investigating the indigenous environmental services in the Boki forest communities, examining their relevance in the context of modern sustainability challenges, and exploring pathways for integrating traditional knowledge into broader conservation and development efforts.

**Purpose of the study**

The main purpose of this study was to examine how indigenous environmental services impact the sustainability of forest resources in Boki communities. Specifically, the study seeks:

1. To examine the influence of indigenous environmental knowledge on the sustainability of forest resources in Boki communities.
2. To assess how community participation in indigenous environmental practices affects the sustainability of forest resources in Boki communities.

**Research hypotheses**

The following research hypotheses were formulated to guide the study

1. Indigenous environmental knowledge significantly influences the sustainability of forest resources in Boki communities.
2. Community participation in indigenous environmental practices significantly influences the sustainability of forest resources in Boki communities.

**Methodology**

**Research Design**

This study adopts a survey research design. The research design will allow for an in-depth exploration of how indigenous practices contribute to the sustainability of forest resources in these communities.

## Study Area

The study was conducted in the Boki Local Government Area of Cross River State, Nigeria. Boki is located in the southeastern region of Nigeria and is part of the Cross River National Park, a biodiversity hotspot. The area is home to indigenous communities that have lived in close connection with the forest for generations, relying on forest resources for sustenance and cultural practices. The Boki region offers a valuable context for exploring the role of traditional ecological knowledge in managing forest resources sustainably.

## Population and Sample

The target population for this study comprises members of the Boki forest communities, including indigenous leaders, elders, and local resource users such as farmers, hunters, and gatherers. These individuals possess traditional knowledge about forest resource management, which is essential for understanding the role of indigenous environmental services in sustainability efforts.

To ensure diversity and representativeness, a purposive sampling technique was employed. This approach allowed the researcher to select individuals who are knowledgeable about indigenous environmental practices and are directly involved in the management of forest resources. A sample of 280 participants was selected from different Boki villages, ensuring a mix of genders, ages, and roles within the community (e.g., elders, youth, women, and men).

## Data Collection Methods

This study employed a questionnaire as the instrument for data collection. It has two sections; A and B. Section A handled the respondents' demographic data while section B elicited responses based on the two sub-independent variables (5 items each on a response rubric of SA = strongly agree, A = agree, D = disagree, and SD = strongly disagree), and 10 questions to answer to the dependent variable. Thus, the instrument has a total of 20 items. The instrument was validated by experts in Environmental Education while the reliability was determined using the Cronbach alpha reliability coefficient where the instrument was administered to 30 respondents in Ikom LGA. Data obtained were analysed and a reliability range of .77 - .89 was considered high enough to justify the use of the instrument.

## Data Analysis

Numerical values were assigned to the responses based on the following scoring key – Strongly Agree (SA)/ = 4 points; Agree (A= 3 points; Disagree (D= 2 points; and, Strongly Disagree (SD= 1 point. The scoring was reversed for negative worded items. Pearson's Correlation Analysis was used to test the hypotheses.

## Ethical Considerations

This study adhered to ethical guidelines throughout the research process. Ethical considerations include:

1. **Informed Consent:** Participants were fully informed about the nature and purpose of the study, and their voluntary participation were sought through informed consent. Participants were assured of confidentiality and their right to withdraw from the study at any time without consequence.
2. **Confidentiality and Anonymity:** All data collected were kept confidential, and participants' identities will be anonymized in any reports or publications arising from the study.
3. **Cultural Sensitivity:** The study was conducted with respect for the cultural practices and beliefs of the Boki communities. The researcher engaged in ethical and culturally sensitive interactions, ensuring that the indigenous knowledge shared is respected and accurately represented.
4. **Community Benefit:** The study aims to contribute to the local communities by documenting and validating their traditional knowledge and environmental practices, which can be used to advocate for their inclusion in policy-making and conservation efforts.

## Limitations

The study is subject to some limitations, including:

1. **Access to Participants:** Some community members were reluctant to share traditional knowledge due to concerns about its misuse or exploitation. Efforts were made to build trust within the community to ensure open and honest participation.
2. **Generational Gaps:** The diminishing participation of younger generations in traditional environmental practices may limit the depth of insights gathered from this group. However, the researcher prioritized gathering data from older community members who are the custodians of indigenous knowledge.

## Results

### $Ho_1$

Indigenous environmental knowledge significantly influences the sustainability of forest resources in Boki communities.

The result of the Pearson Product Moment Correlation analysis revealed a significant positive relationship between indigenous environmental knowledge and the sustainability of forest resources in Boki communities. The analysis shows a moderate positive correlation coefficient of **0.523**, indicating that as indigenous environmental knowledge increases, the sustainability

of forest resources also improves. This relationship was found to be statistically significant, with a p-value of **0.000**, which is well below the threshold of 0.05.

These findings suggest that indigenous environmental knowledge plays a crucial role in promoting the sustainability of forest resources in the Boki communities. As such, the study rejects the null hypothesis, confirming that there is indeed a significant influence of indigenous environmental knowledge on forest sustainability. This underscores the importance of preserving and integrating traditional ecological knowledge in modern conservation practices to enhance the long-term management of forest resources.

**Table 1:** Pearson Product Moment Correlation analysis of the relationship between Indigenous environmental knowledge and the sustainability of forest resources (N=280).

| **Variables** | $\bar{x}$ | **SD** | **r-cal** | **p-value** |
|---|---|---|---|---|
| Indigenous environmental knowledge | 16.81 | 1.355 | | |
| | | | .523** | .000 |
| the sustainability of forest resources | 33.91 | 1.792 | | |

* Significant at .05 level

**$Ho_2$**

Community participation in indigenous environmental practices significantly influences the sustainability of forest resources in Boki communities.

The result of the Pearson Product Moment Correlation analysis in Table 2 shows a statistically significant positive relationship between community participation in indigenous environmental practices and the sustainability of forest resources in the Boki communities. The correlation coefficient (r-cal) is 0.195, indicating a weak but positive correlation between the two variables. This suggests that as community participation in indigenous environmental practices increases, the sustainability of forest resources also tends to improve, although the relationship is not very strong.

The p-value is 0.001, which is well below the significance level of 0.05, indicating that the observed correlation is statistically significant. This means that the result is unlikely to have occurred by chance and supports the conclusion that community participation in traditional environmental practices has a meaningful impact on the sustainability of forest resources in the Boki communities.

In summary, the study rejects the null hypothesis, affirming that community participation in indigenous environmental practices significantly influences the sustainability of forest resources. While the correlation is relatively weak, it still highlights the importance of involving the community in environmental management to promote sustainable forest practices.

**Table 2:** Pearson Product Moment Correlation analysis of the relationship between Community participation in indigenous environmental practices and the sustainability of forest resources in Boki communities. N=280.

| **Variables** | $\bar{x}$ | **SD** | **r-cal** | **p-value** |
|---|---|---|---|---|
| Community participation in indigenous environmental practices | 25.06 | 1.16 | | |
| | | | .195** | .001 |
| sustainability of forest resources | 33.9143 | 1.79200 | | |

* Significant at .05 level.

**Discussion**

**Indigenous Environmental Knowledge and Sustainability of Forest Resources**

The results emphasizing the significance of indigenous environmental knowledge (IEK) in promoting forest sustainability in Boki communities resonate strongly with broader scholarly perspectives on the role of traditional ecological practices in environmental conservation. This alignment underscores the validity of the findings and highlights the relevance of locally rooted knowledge systems in contemporary conservation discourse.

Indigenous knowledge, as observed in the Boki communities, serves as a living repository of ecological insight, shaped by generations of close interaction with the natural environment. This relationship fosters a deep understanding of local ecosystems, enabling communities to develop context-specific strategies for sustainable resource use. The findings corroborate Berkes' (2018) assertion that IEK plays a critical role in the long-term conservation of biodiversity, especially in forest-dependent regions. By relying on practices passed down through oral traditions and cultural norms, communities can maintain a delicate balance between resource utilization and ecosystem preservation.

In the context of Cross River State, and particularly within Boki, this traditional ecological wisdom manifests through practices such as the maintenance of sacred groves, seasonal hunting bans, and taboos against certain exploitative behaviors. These culturally embedded

practices not only regulate access to forest resources but also foster a strong sense of stewardship and collective responsibility (Rawat & Lakra, 2025). For example, sacred groves serve both spiritual and ecological purposes, acting as biodiversity hotspots and natural reserves protected from human interference. Anaka and Edawa (2019) further highlight how the spiritual value attached to forests can discourage activities like illegal logging and over-hunting, thus aligning spiritual reverence with ecological sustainability.

Therefore, the findings from the Boki communities illustrate how traditional knowledge systems can complement modern conservation strategies. They demonstrate that effective forest management need not rely solely on formal scientific approaches but can be significantly enhanced by integrating indigenous practices. Recognizing and legitimizing IEK in policy frameworks could strengthen community participation, ensure cultural continuity, and foster more inclusive and sustainable environmental governance.

**Community Participation in Indigenous Environmental Practices and Sustainability of Forest Resources**

The results from the Pearson Product Moment Correlation analysis indicating a statistically significant positive relationship between community participation in indigenous environmental practices and the sustainability of forest resources in Boki communities provide empirical support for a well-established body of knowledge on participatory forest management.

This finding reinforces the argument that community involvement is essential to effective and sustainable forest governance, particularly in indigenous contexts where ecological knowledge and conservation norms are deeply embedded in cultural practices. The positive correlation suggests that as community engagement in traditional environmental practices increases, so too does the sustainability of forest resources underscore the practical and cultural importance of grassroots participation in conservation.

As Berkes (2018) and others have emphasized, Community-Based Natural Resource Management (CBNRM) frameworks succeed because they leverage local knowledge, foster a sense of ownership, and empower communities to make decisions about their environmental futures. This is especially true in Boki, where traditional practices such as communal hunting, forest regeneration activities, and non-timber forest product (NTFP) collection are not just subsistence strategies but are also mechanisms of collective resource governance.

Brown and Lassoie (2010) point out that such practices thrive on inclusive decision-making, where rules around forest use are established and enforced by the community. This can include

seasonal hunting restrictions, rotational harvesting, and the designation of conservation zones, which align with ecological cycles and ensure that regeneration occurs. Snyder (2020) further supports this by noting that community-driven restrictions—such as abstaining from harvesting during sensitive ecological periods—reflect an intricate understanding of forest dynamics that external actors often overlook.

In Boki, this participatory approach strengthens environmental stewardship by embedding conservation into the social fabric. It cultivates local accountability and peer enforcement, both of which enhance compliance and reduce the likelihood of over-exploitation. The findings of the study thus validate the effectiveness of participatory conservation models and advocate for policies that formalize and support indigenous environmental governance structures.

In conclusion, the positive correlation between community participation and forest sustainability in Boki communities illustrates that local actors are not passive beneficiaries of conservation programs they are active custodians. Therefore, empowering these communities through policy support, legal recognition of traditional practices, and integration into broader conservation frameworks is key to achieving sustainable environmental outcomes.

**Conclusion and Recommendations**

The study concludes that indigenous environmental knowledge and active community participation play a vital role in the sustainable management of forest resources in Boki Local Government Area. The positive correlation between these factors emphasizes the value of traditional practices in promoting ecological balance and long-term resource conservation.

**Recommendations:**

1. Integrate Indigenous Knowledge into Policy – Government and environmental agencies should formally recognize and incorporate indigenous environmental practices into forest management policies.
2. Support Community-Based Management – Strengthen local institutions and community groups involved in forest governance through training, resources, and legal backing.
3. Promote Environmental Education – Raise awareness among community members, especially the youth, on the importance of traditional ecological knowledge and conservation.
4. Encourage Participatory Monitoring – Involve local communities in monitoring and evaluating conservation efforts to ensure transparency, accountability, and continued effectiveness.

## References

Adeniyi, D. T. (2021). *The use of Indigenous Knowledge in Forest Management by the Aboriginal People in Ogun State, Nigeria* (Doctoral dissertation, MSc Thesis, Forest and Nature Conservation, Wageningen University and Research).

Adetola, B. O., & Adetoro, A. O. (2014). Threats to biodiversity conservation in Cross River National Park, Nigeria. *International Journal of Conservation Science*, *5*(4).

Anaka, R. E. N., & Edawa, R. (2019). *Forest conservation and management practices in Cameroon: Case study of Bimbia-Bonadikombo community forest and Takamanda national park* (Doctoral dissertation, Brandenburgische Technische Universität Cottbus-Senftenberg).

Berkes, F. (2018). *Sacred ecology: Traditional ecological knowledge and resource management*. Routledge.

Brown, H. C. P., & Lassoie, J. P. (2010). Institutional choice and local legitimacy in community-based forest management: lessons from Cameroon. *Environmental Conservation*, *37*(3), 261-269.

Carm, E. (2014). Inclusion of indigenous knowledge system (IKS)–A precondition for sustainable development and an integral part of environmental studies. *Journal of Education and Research*, *4*(1), 58-76.

Duguma, L. A., Atela, J., Minang, P. A., Ayana, A. N., Gizachew, B., Nzyoka, J. M., & Bernard, F. (2019). Deforestation and forest degradation as an environmental behavior: unpacking realities shaping community actions. *Land*, *8*(2), 26.

Krause, T., Nielsen, T., Guia-Diaz, L., Lehsten, V., Olsson, O., & Zelli, F. (2019). What future for primates? Conservation struggles in the forests of Cross River State, Nigeria. *Sustainability Science, 14*, 1515–1529. https://doi.org/10.1007/s11625-019-00670-y

Nneji, L. M., Adeola, A. C., Adedeji, B. E., Olatunde, O., Onadeko, A. B., Eniang, E. A., ... & Olory, C. S. (2021). Species richness, distribution pattern, and conservation status of amphibians in Cross River National Park, south-eastern Nigeria. *Biologia*, *76*(9), 2573-2588.

Ogar, M. B. (2023). *Sacred Forests and Rivers: The Role of Indigenous Religion in Promoting Environmental Sustainability in Abanyom, Cross River State, Nigeria*. University of Johannesburg (South Africa).

Rawat, G., & Lakra, H. S. (2025). Examining the Impact of Forest Policies on Sacred Groves in India: A Historical Review. *History and Sociology of South Asia*, *19*(1), 50-69.

Ruiz-Mallén, I., & Corbera, E. (2013). Community-based conservation and traditional ecological knowledge: implications for social-ecological resilience. *Ecology and Society*, *18*(4).

Shiva, V. (2016). *The violence of the green revolution: Third world agriculture, ecology, and politics*. Zed Books.

Snyder, G. (2020). *The practice of the wild: Essays*. Catapult.

Takon, J. T., & Amalu, T. E. (2013). Assessment of natural resource conservation in Boki Local Government, Cross River State, Nigeria. *Environmental Science: An Indian Journal*, *8*(4), 123–131.