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CULTURAL SECURITY AND ENVIRONMENTAL CONSERVATION: EXPLORING THE LINK BETWEEN INDIGENOUS KNOWLEDGE SYSTEMS AND SUSTAINABLE RESOURCE MANAGEMENT IN CROSS RIVERS STATE

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Abstract
This study takes a unique approach by examining the significance of indigenous knowledge systems (IKS) in preserving the environment and managing resources in Cross Rivers State, Nigeria. The objective is to identify and record various Indigenous Knowledge Systems (IKS) activities, examine their connection to environmental practices, and evaluate their potential for inclusion into formal conservation initiatives. The study utilizes a mixed-methods approach, drawing on Traditional Ecological Knowledge (TEK) and cultural ecology frameworks. Qualitative data collection entails conducting comprehensive interviews and participant observation within specific Indigenous groups. Quantitative data collection involves conducting ecological assessments in partnership with local experts. Data analysis employs thematic analysis for qualitative data and descriptive and inferential statistics for quantitative data. The findings indicate that Indigenous Knowledge Systems (IKS) have a major impact on the utilization of resources, decision-making processes, and environmental outcomes in Cross River State. Traditional farming practices, forest management techniques, water conservation measures, medical expertise, and cultural practices all have a role in the sustainable management of resources and the protection of biodiversity. The study also highlights the difficulties and possibilities of incorporating Indigenous Knowledge Systems (IKS) into official conservation plans. It emphasizes the importance of policy support, community involvement, and the development of skills and knowledge. The findings of this study indicate that Indigenous Knowledge Systems (IKS) have a pivotal role in the preservation of the environment and the sustainable management of resources in Cross River State. The report suggests that to fully harness the potential of Indigenous Knowledge Systems (IKS) for sustainable development, it is important to focus on several key areas. These include improving policy frameworks, increasing community involvement, investing in capacity building, promoting research and documentation, integrating IKS into education, addressing economic obstacles, and establishing monitoring and evaluation mechanisms.

Keywords Indigenous Knowledge Systems, Environmental Conservation, Sustainable Resource Management and Cross River State.

INTRODUCTION

The convergence of environmental conservation and cultural security is becoming more widely acknowledged as critical to sustainable development on a global scale (UNESCO, 2021). indigenous knowledge systems have been developed over millennia of direct interaction and observation and are recognized for their profound grasp of regional ecosystems (Nakashima et al., 2012). These knowledge systems provide crucial sustainable resource management techniques considering the worsening effects of climate change and environmental deterioration (Reid et al., 2021). The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) highlights the significance of Indigenous knowledge preservation and utilization in environmental conservation efforts. It emphasizes the importance of Indigenous communities' cultural practices in conserving biodiversity (UN, 2007). To maintain the sustainability of natural resources and the preservation of cultural heritage, there is a rising global push to incorporate these traditional practices into contemporary environmental policy (CBD Secretariat, 2012).

Because of the enormous ecological and cultural diversity of the continent, there is a robust correlation between cultural security and environmental protection in Africa (Mulrennan & Cocks, 2013). Traditional ecological knowledge, or TEG, has long been used by African indigenous groups to manage natural resources sustainably. To avoid overgrazing and preserve the health of their rangelands, the Maasai people of East Africa, for example, utilize rotational grazing (Rutten,

2018). Comparably, to guarantee water availability in arid conditions, the Himba people of Namibia employ highly developed water management techniques (Sullivan, 2018). There is a growing recognition of these approaches and their integration into regional and national conservation policies (Mulrennan & Cocks, 2013). Africa's indigenous knowledge must be harnessed to achieve sustainable development and environmental resilience, as stated in the African Union's Agenda 2063 (African Union Commission, 2015).

In regions such as Nigeria, endowed with a wealth of biodiversity and cultural heritage, environmental conservation and cultural security are two indispensable components of sustainable development (Agyekum et al., 2020). Local communities' indigenous knowledge systems are profoundly rooted in the interplay between these two elements (UNESCO, 2022). Traditional practices and beliefs have been instrumental in conserving the environment and managing natural resources in Nigeria for an extended period (Akor et al., 2023). This essay investigates how indigenous knowledge systems contribute to the conservation of the environment and the sustainable management of resources, guaranteeing Nigerian communities' cultural security.

The Niger Delta region of Nigeria, a culturally rich and ecologically significant area known for its diverse ethnic groups and abundant natural resources (Bassey & Ajiboye, 2023), has faced significant environmental challenges due to oil exploration and exploitation (Akpan, 2021). In this context, the importance of integrating indigenous knowledge systems into sustainable resource management cannot be overstated. Understanding the intricate connection between cultural security and environmental conservation through the study of indigenous knowledge is a crucial step towards promoting sustainable development in the Niger Delta (Ebeku, 2020).

The concept of cultural security is centred on the protection and promotion of Indigenous cultures, with a focus on preserving traditional ways of life, languages, and practices (UNESCO, 2021). In the Niger Delta, the indigenous communities, such as the Ijaw, Ogoni, Urhobo, and others, play a pivotal role in shaping their natural environment, a fact that is reflected in their rich cultural heritages (Nwilo & Badejo, 2005). These communities have developed sophisticated systems of knowledge and practices that influence their interaction with the environment (Bassey & Ajiboye, 2023).

Cross River State, Nigeria, serves as a microcosm for the larger African and global setting regarding environmental preservation and cultural security. Numerous ethnic groups inhabit the state; they all have rich customs and indigenous knowledge systems essential to the sustainable management of natural resources (Moses, 2021). Cultural security, the preservation of a community's cultural legacy, traditions, and practices, is vital for ensuring the health and recovery of a society (Aluko, 2018). It safeguards the cultural identity, values, and knowledge systems essential for a community's well-being. Upholding cultural security is crucial for societal unity and diversity, preserving indigenous knowledge, and fostering a sense of belonging among individuals (Aluko, 2018).

Indigenous knowledge systems are comprehensive knowledge systems that originate within Indigenous civilizations, exist separately from modern scientific knowledge systems, and are transmitted throughout generations (Tharakan, 2017). These systems encompass diverse knowledge, such as ecological, agricultural, medical, and spiritual knowledge, that indigenous cultures have gathered and developed over time (Feyssa, 2012). Indigenous peoples' unique

cultural practices, beliefs, and experiences significantly influence their knowledge systems (Padmasiri, 2017). Indigenous knowledge systems take a comprehensive approach that recognizes the interdependence between humans and the environment and strongly emphasizes sustainable behaviours Berardi et al., (2014).

Indigenous knowledge systems are a cornerstone of environmental preservation and resource management in Cross Rivers State. Research suggests that integrating indigenous knowledge with modern conservation methods holds significant promise, leading to more effective and sustainable outcomes (Selemani, 2020). The indigenous tribes in Cross Rivers State possess a rich reservoir of ancestral ecological knowledge, which includes sustainable strategies for managing natural resources like forests, rivers, and wildlife (Mairiga & Ibrahim, 2021).

Moreover, the active participation of Indigenous Peoples and their expertise in every phase of environmental endeavours, ranging from initial planning to final assessment, is vital and indispensable for the effectiveness of conservation activities (Egeruoh-Adindu, 2022). Indigenous knowledge systems present alternate understandings of the connection between humans and the natural world, highlighting all living organisms' interrelatedness and mutual reliance (Ens et al., 2012). By acknowledging the legitimacy of Indigenous and non-Indigenous environmental ideologies, we can foster cross-cultural partnerships that honour and incorporate a wide range of knowledge systems, thereby making all involved feel valued and respected (Egeruoh-Adindu, 2022).

Utilizing Indigenous Knowledge in Cross Rivers State, where environmental issues are widespread, can result in sustainable and culturally suitable solutions for effective environmental governance (Adam et al., 2021). Transiting Indigenous knowledge within local communities can bolster endeavours to conserve biodiversity and foster sustainable practices deeply grounded in ancestral understanding (Adam et al., 2021). Policymakers and conservation practitioners can enhance their environmental management strategies by recognizing and integrating Indigenous information, which encompasses a valuable reservoir of information held by Indigenous groups.

Cross River State, situated in the southern region of Nigeria, is well-known for its abundant cultural diversity (Moses, 2021). The state is home to more than 40 different ethnic groups, each with its own unique traditions, languages, and cultural practices (Ekuri Initiative, 2018). The primary ethnic groupings comprise the Efik, Ejagham, and Bekwarra, among other communities (Moses, 2021). The diverse cultural heritage is commemorated through many festivals, traditional dances, and ceremonies.

The annual Calabar Carnival is a significant cultural festival in Cross River State, commonly recognized as "Africa's Largest Street Party" (Ayade, 2019). The month-long celebration, which takes place in December, exhibits the state's dynamic cultural legacy through lively processions, music, dance, and intricate attire. The carnival draws in tourists from many parts of Nigeria and beyond, fostering cultural interchange and tourism (Ayade, 2019).

Aside from the carnival, the state organizes many cultural events, like the Leboku Festival of the Ugep people. This festival commemorates the New Yam harvest with traditional music, dancing, and rituals (Okafor, 2017). The Ekpe Festival of the Efik people is a culturally important festival characterized by secret society rituals and masquerades that profoundly impact the community's social and political dynamics (Eyo, 2015).

Cross River State is notable for its diverse and abundant biological landscape (World Bank, 2010).

The state possesses many ecosystems, including rainforests, mangrove swamps, and savannahs. The Cross River National Park in Nigeria is a significant conservation area that serves as a habitat for various endangered species and is considered a crucial biodiversity hotspot (Oates et al., 2004).

The Cross River National Park comprises two portions, Oban and Okwangwo, and spans an area of almost 4,000 square kilometres (Oates et al., 2004). The park is famous for its thick rainforest, a component of the extensive Guinean Forests of West Africa, a region known for its high biodiversity. The area supports various species, including the highly endangered Cross River gorilla, Nigerian-Cameroonian chimpanzee, forest elephants, and numerous bird species (Oates et al., 2004).

Moreover, the state's many rivers, including the Cross River and its tributaries, have a vital impact on the ecological equilibrium and the sustenance of the local inhabitants (World Bank, 2010). These rivers facilitate fishing activities and are crucial water sources for agriculture and home consumption.

Cross River State is renowned for its diverse ecological and tourist attractions, including the Afi Mountain Wildlife Sanctuary, which houses endangered primates and other wildlife species, and the Agbokim Waterfalls, famous for its breathtaking beauty and recreational opportunities (Moses, 2021).

The indigenous knowledge systems in Cross River State possess distinctive attributes, including communal ownership, oral transmission throughout generations, and the potential to generate economic benefits (Usongo & Moses, 2013). These systems are essential for conserving and managing environmental resources by incorporating traditional religious practices and beliefs that promote the preservation of fauna and flora. As a result, these systems facilitate the proliferation of wildlife species and the unrestricted movement of wild animals in forests and other habitats (Bassey & Ajiboye, 2023). In South-Eastern Nigeria, local populations living near protected areas have successfully incorporated indigenous knowledge systems into their practices. This has revealed a comprehensive understanding of the ecology and biology of valuable species, highlighting the significance of combining local knowledge with scientific information to achieve effective community-based conservation education and nature conservation goals (Inyang & Okeyoyin, 2010).

The indigenous knowledge systems in Cross River State, Nigeria, significantly impact environmental conservation practices. This is due to the active participation of rural women in the usage and conservation of forest resources. Anoyom et al. (2022). Indigenous traditions encompass gathering diverse forest resources for sustenance and income generation, while conservation efforts are directed towards certain plant species by imposing limitations on cutting and utilization. Anoyom et al. (2022). The intergenerational transfer of indigenous knowledge has enabled the sustainable stewardship of natural resources, underscoring the significance of traditional methods in upholding ecological equilibrium and biodiversity. Yohanes et al. (2023) By integrating indigenous knowledge systems into conservation plans, local communities may contribute to preserving the environment and guarantee long-term sustainability in Cross River State, Yohanes et al. (2023) and Nugroho. et al. (2022).

Aim:

To investigate the role of indigenous knowledge systems in environmental conservation and sustainable resource management in Cross Rivers State, Nigeria.

Objectives:

i. To identify and document the diverse indigenous knowledge systems employed by different communities in Cross Rivers State for environmental conservation and resource management.

ii. To analyze the relationship between indigenous knowledge systems and environmental practices, examining how these systems influence resource use, decision-making, and overall environmental outcomes.

iii. To assess the potential of integrating indigenous knowledge systems into formal conservation strategies in Cross Rivers State, identifying opportunities, barriers, and best practices for effective integration.

Theoretical Frameworks

The examination of the relationship between cultural security and environmental protection in Nigeria, namely through indigenous knowledge systems, is based on many theoretical frameworks, including Traditional Ecological Knowledge (TEK) and Cultural Ecology. These frameworks provide significant perspectives on the intricate connection between indigenous cultures and their environmental surroundings (Berkes, 2018).

Traditional Ecological Knowledge (TEK)

Traditional Ecological Knowledge (TEK) refers to the knowledge and practices developed by indigenous and local communities over generations based on their observations and interactions with the natural environment.

Traditional Ecological Knowledge (TEK) refers to the collective knowledge, practices, and beliefs that indigenous and local groups acquire through direct engagement with their environment over many generations (Berkes, 2012). TEK encompasses various knowledge domains, such as environmental management strategies, crop rotation, agroforestry, and water conservation techniques, improving soil health and fostering biodiversity (Turner et al., 2000). Biodiversity knowledge, a vital element of Traditional Ecological Knowledge (TEK), refers to a comprehensive comprehension of indigenous species, their ecological functions, and their interrelationships within the ecosystem (Gadgil et al., 1993). TEK incorporates cultural and spiritual values that are integral to preserving natural resources and maintaining ecological equilibrium. Key components include sacred groves, rituals, and taboos Zulkifli et al., . (2023).

The comprehension of TEK is crucial for comprehending the methods employed by Nigerian indigenous groups in the management and preservation of their natural resources (Akor et al., 2023). The text underscores incorporating sustainable practices within cultural traditions and emphasizes the significance of safeguarding these practices to ensure environmental sustainability and cultural preservation (Ogar et al., 2021). TEK excels in its advocacy for sustainable resource management, facilitating community resilience, and endorsing biodiversity conservation (Berkes, 2018). Nevertheless, TEK encounters obstacles such as the depletion of knowledge caused by modernity and globalization, and its position in official conservation strategies is sometimes underestimated (Nakashima et al., 2012).

Cultural Ecology

Cultural ecology studies the relationship between human societies and their environment, focusing on how the natural world shapes cultural beliefs, practices, and social systems.

Cultural ecology is a multidisciplinary discipline investigating the complex relationships between human societies and their environments. It examines how ecological conditions influence and are influenced by cultural norms, beliefs, and social structures (Sewu, 2023). This method integrates insights from ecology and anthropology to comprehend how societies adjust to their

environment (Berkes et al., 2000). Cultural ecology elucidates the impact of cultural practices on ecological systems and vice versa by investigating the dynamic interplay between humans and their environment (Guo et al., 2022). Adaptation is a fundamental concept in this framework, which underscores the importance of cultural traditions, social organizations, and technological innovations in preserving ecosystems and livelihoods in the face of environmental challenges (Sewu, 2023).

The significance of including ecological and cultural factors in analysing a variety of phenomena has been underscored by recent research. For example, research has demonstrated that the ecological context significantly influences the development of cultural norms and behaviors, including generalized social trust (Kong, 2012). Additionally, the micro-macro interplay of factors that influence interpersonal trust emphasizes the evolutionary responses of human societies to environmental stressors, thereby contributing to the development of in-group cooperativeness (Jing et al., 2021). This ecocultural perspective illuminates how environmental conditions affect social dynamics and cultural practices.

Additionally, it is imperative to incorporate ecological principles into management frameworks to effectively address intricate social-ecological issues (Eddy et al., 2014). To guarantee long-term sustainability and community well-being, sustainable development initiatives, including tourism in protected areas, underscore the necessity of a comprehensive evaluation that considers ecological, economic, and social factors (Zhang et al., 2023). Cultural ecology underscores the interdependence of social and ecological systems by examining the complex relationship between human societies and the natural environment (Siregar, 2023). The study of cultural ecology is particularly pertinent in examining the role of indigenous Nigerian groups in promoting environmental conservation (Bassey & Ajiboye, 2023). Its comprehensive perspective integrates cultural and ecological components and provides a holistic understanding of human interactions and the environment (Crate, 2011). The framework highlights the importance of adaptive solutions that communities create to address environmental difficulties. It also acknowledges the significance of cultural variety in fostering sustainable development and environmental preservation (UNESCO, 2022). Nevertheless, cultural ecology poses several difficulties, such as the intricacy of examining the interaction between cultural and ecological elements and the context-dependent character of adaptive strategies, which might hinder the generalization of findings.

Traditional Ecological Knowledge (TEK) and cultural ecology are crucial theoretical frameworks for comprehending the connection between cultural security and environmental conservation in Nigeria. TEK prioritizes the importance of Indigenous knowledge systems in fostering sustainable resource management. At the same time, cultural ecology provides a comprehensive viewpoint on adaptive mechanisms and the relationship between humans and the environment.

Kamakaula (2023) explores the pivotal role of local knowledge in natural resource conservation within the context of traditional agriculture, emphasizing its significance for sustainable resource management. The research, employing an interdisciplinary approach combining anthropological fieldwork and environmental studies, reveals that local communities possess invaluable insights and practices that promote ecological harmony and conservation (Kamakaula, 2023). Indigenous practices like agroforestry, crop rotation, and seed saving often demonstrate greater sustainability and resilience than modern methods, reflecting a deep understanding of local

ecological interdependencies (Kamakaula, 2023). This research underscores the importance of recognizing and incorporating indigenous wisdom into modern conservation practices, fostering partnerships between local communities, policymakers, and researchers to develop holistic and effective strategies for conserving natural resources (Kamakaula, 2023). Importantly, it also highlights the potential for integrating indigenous knowledge systems into formal conservation strategies, particularly in regions like Cross Rivers State, thereby enhancing the effectiveness of conservation efforts.

Indigenous knowledge systems play a crucial role in developing effective environmental conservation strategies globally by offering valuable insights and practices honed over generations Paschal et al. (2024). Yohanes et al. (2023). Amanda et al. (2022). These systems, deeply rooted in traditional practices, myths, taboos, and rituals, provide a holistic understanding of the environment and its interdependencies. For instance, they guide sustainable resource management approaches such as agroforestry, where trees are integrated into agricultural landscapes to prevent soil erosion and provide shade for crops; crop rotation, which helps maintain soil fertility and avoid pest outbreaks; and seed saving, a practice that preserves biodiversity by maintaining a diverse pool of plant varieties. Indigenous knowledge fosters a harmonious relationship between human livelihoods and nature and contributes to the long-term maintenance of social-ecological systems, resisting degradation and biodiversity loss.

The Role of Local Knowledge in Natural Resources Conservation:

This article explores the pivotal role of local knowledge in conserving natural resources from the unique perspective of environmental anthropology within the context of traditional agriculture. Traditional agricultural practices have historically relied on indigenous knowledge systems passed down through generations to maintain a delicate balance between human livelihoods and the environment. This research endeavors to shed light on the invaluable insights offered by local communities and their practices in preserving ecological harmony. Through an interdisciplinary approach, combining anthropological fieldwork and environmental studies, we examine how local knowledge systems influence the sustainable use of natural resources, focusing on agricultural practices and their impact on ecosystems. We also analyze the transmission of this knowledge within communities and the adaptations made over time in response to changing environmental conditions. This study's findings underscore the resilience of local knowledge as a source of practical wisdom for addressing contemporary environmental challenges. Indigenous practices, such as agroforestry, crop rotation, and seed saving, have consistently proven more sustainable and resilient than modern agricultural methods.

Moreover, these traditional practices reflect a deep understanding of the local environment and its ecological interdependencies. By understanding and respecting the indigenous knowledge held by traditional agricultural communities, policymakers, conservationists, and researchers can collaborate with local stakeholders to develop holistic and effective strategies for conserving natural resources. This research emphasizes the need to foster partnerships integrating scientific knowledge and local wisdom to achieve long-term sustainability and resilience in agriculture and environmental management. The time for collaboration is now, and the potential benefits are immense.

This article contributes to the growing body of literature, highlighting the importance of

acknowledging and incorporating local knowledge in addressing environmental issues. It underscores the promising future of environmental conservation, with the integration of local knowledge paving the way for more effective and sustainable practices. This optimistic outlook is based on the proven resilience and effectiveness of indigenous practices, which offer a beacon of hope for the future of our planet.

Identification and Documentation of Indigenous knowledge systems:

Traditional ecological knowledge

Indigenous communities integrate traditional ecological knowledge into modern conservation efforts through various practices and approaches. They emphasize the importance of local wisdom, such as agroforestry, crop rotation, and seed saving (Yohanes et al., 2023), and values like respect for the forest, humanizing the environment and leading a simple life (Erman et al., 2023). These communities also utilize cultural practices like totemism, taboos, and the sacredness of water sources to enhance environmental conservation (Tenjei et al., 2022). By combining modern science with Indigenous knowledge, communities can develop bottom-up, community-based disaster management mechanisms incorporating traditional ecological knowledge in disaster planning and response (Jie et al., 2023). Despite facing challenges like top-down decision-making and a lack of policy support, indigenous communities are paving the way for a hopeful future. They demonstrate the immense potential of integrating their knowledge into contemporary conservation strategies for sustainable environmental management, offering a promising outlook for the future.

Tenjei et al. (2022) conducted a study that uniquely focused on the Ogiek indigenous community in the Mau Forest of Kenya. They employed a descriptive survey design with closed questionnaires and semi-structured interviews to gather data from 417 participants. Their research strongly connected the Ogiek people's cultural practices and environmental conservation. The authors found that totemism, taboos, and the sacredness of water sources were instrumental in fostering ecological protection. For instance, certain trees were considered taboo to cut, ensuring their preservation and specific animals and plants were revered as totems, contributing to biodiversity and honey production.

The study further highlighted the mechanisms through which cultural practices are reinforced within the Ogiek community. Decrees from deities and orders from the council of elders were identified as practical strategies to regulate resource use and promote conservation. However, the authors also noted the community's significant challenges in maintaining these practices, including the need for more supportive policies and adequate government backing, interference from top-down decision-making, and resistance from some community members.

While Tenjei et al. (2022) focused on the specific cultural practices of the Ogiek community, their findings resonate with broader research on the role of indigenous knowledge systems in environmental conservation. For instance, Berkes et al. (2000) found that traditional ecological knowledge was crucial for sustainable fisheries management in the Canadian Arctic. Similarly, Shackleton et al. (2015) highlighted the importance of integrating indigenous knowledge into climate change adaptation strategies in southern Africa.

However, Tenjei et al.'s study primarily focused on the Ogiek community's cultural practices and their role in environmental conservation. The research should have explicitly addressed the broader concept of cultural security, which encompasses preserving cultural practices and recognizing and protecting indigenous peoples' rights, identities,

and knowledge systems. This underscores the urgent need for further research into the multifaceted relationship between cultural security and environmental conservation in Indigenous communities, particularly in regions like Cross Rivers State in Nigeria. This research is not important, but it is crucial for understanding and preserving indigenous communities' unique knowledge systems and cultural practices.

Cultural beliefs and values that shape environmental behavior

Cultural beliefs and values play a significant role in shaping both individual and collective environmental behaviours. Research indicates that individualistic values can hinder collective dedication to pro-environmental actions, but there is potential for collective commitment. This potential inspires and motivates, leading to challenges in establishing norms and policies that prioritize a more collectivist orientation Dafi et al. (2024). Moreover, cultural values like hierarchy, individualism, egalitarianism, and collectivism can impact pro-environmental attitudes and behaviours, with hierarchical cultural tendencies showing the most potent positive effect on pro-environmental attitudes ((Atieh et al., (2022). Understanding and addressing these cultural influences is crucial, affecting how much people care about the environment. For example, people with high socioeconomic status and low collectivism are more likely to believe in climate change and act in effective ways for the environment David et al., (2021). This understanding and commitment are crucial for promoting sustainable behaviours individually and collectively.

The relationship between indigenous knowledge systems and environmental practices:

Indigenous knowledge systems, deeply rooted in cultural values and beliefs, significantly influence the decision-making processes regarding resource utilization in Cross Rivers State. These systems, a testament to the wisdom and foresight of past generations, provide a structured and sustainable approach to resource management (Akor et al., 2023). Knowledge within IKS often dictates the timing, location, and methods of resource extraction, ensuring that these activities are in harmony with ecological patterns and that long-term sustainability is promoted (Bassey & Ajiboye, 2023).

For instance, indigenous knowledge systems determine the timing of agricultural activities, such as planting and harvesting, in numerous communities in Cross Rivers State. This follows traditional calendars corresponding to seasonal changes and weather patterns (Ogar et al., 2021). This method enhances crop productivity and reduces the likelihood of soil degradation and resource depletion. Similarly, the IKS (Indigenous Knowledge System) regulates fishing practices by establishing rules for fishing seasons, limiting the number of permitted catches, and designating specific locations as sacred or off-limits. These measures are put in place to safeguard fish populations and preserve natural equilibrium (Inyang & Okeyoyin, 2010).

In addition, indigenous knowledge systems frequently incorporate taboos and limitations on utilizing specific resources, particularly those seen as sacred or crucial for the well-being of the ecosystem (Bassey & Ajiboye, 2023). Taboos function as a means of social control, prohibiting excessive use and guaranteeing the ongoing accessibility of resources for future cohorts. For instance, specific communities may enforce restrictions on the felling of tree species or the hunting of specific animals during defined periods to facilitate the regeneration of these resources and preserve their ecological roles.

IKS has a broader impact on decision-making related to resource utilization, going beyond

ecological factors. Cultural ideas and values, intricately linked to indigenous knowledge systems, influence how people see ownership, access, and allocation of resources (Agyekum et al., 2020). Numerous indigenous groups view resources as shared possessions, and fairness, reciprocity, and respect for traditional customs govern their use (Ogar et al., 2021). Utilizing a communal approach to resource management cultivates a shared sense of accountability and promotes sustainable practices that yield advantages for the entire community.

The Effectiveness of indigenous knowledge systems in Promoting Sustainable Practices

Indigenous knowledge systems are acknowledged for their essential role in promoting sustainable practices in various domains. Research has emphasized the significance of IK in sustainable supply chain management (Mehdikhani & Valmohammadi, 2019), wetland sustainability (Dixon, 2005), and the resolution of socio-ecological crises (Parsons et al., 2022). Indigenous knowledge systems are considered indispensable for maintaining sustainable natural resource management practices and rural livelihoods, as it is perpetually evolving and adapting to environmental and socio-economic shifts (Dixon, 2005). In addition, indigenous knowledge systems have been effectively implemented in various contexts, including the sustainable development of urban areas through environmental management, inspiring and motivating further research and application (Hari, 2020).

Integrating indigenous knowledge systems into educational practices has been emphasized to promote sustainable development, cultivate cultural identity, and foster holistic growth among learners (S, 2023). indigenous knowledge systems has been acknowledged for its significant contribution to climate-smart agriculture in the agricultural sector, underscoring its potential to address pressing environmental issues. Furthermore, the relevance of IKS in environmental conservation efforts has been demonstrated by examining its sustainability and efficacy in conserving natural forests (Sanga, 2021).

Additionally, it has been suggested that the integration of IKS with contemporary climate change science serves as the foundation for a comprehensive community-based response to the effects of climate change Mugambiwa, S. S. (2020). The management of indigenous knowledge systems has been designated as a method to revitalize endangered cultural practices, promote community-based involvement in development programs, and revalidate dying cultures, thereby empowering the community (Padmasiri, 2017). Furthermore, acknowledging indigenous knowledge systems capacity building for development fosters a harmonious relationship between developing countries' social systems and the environment (Al-Roubaie, 2010).

In their study, Yohanes et al. (2023) asserts and discovered that local knowledge systems are crucial in ensuring the sustainable utilization and preservation of natural resources in traditional farming techniques. Indigenous systems, including agroforestry, crop rotation, and seed conservation, have consistently demonstrated greater sustainability and resilience than contemporary agriculture methods. These behaviours exhibit a profound comprehension of regional ecosystems and their interconnectedness.

The study utilized an interdisciplinary methodology, integrating anthropological fieldwork with environmental research. The data collection process consisted of conducting interviews, engaging in participant observation, and organizing focus groups within conventional agricultural areas. In addition, environmental data was gathered to evaluate the influence of

traditional activities on ecosystems.

In their study, Yohanes et al. (2023) determined that indigenous knowledge is vital in tackling current environmental issues. The study highlights the importance of policymakers, conservationists, and researchers collaborating with local stakeholders to combine scientific knowledge with traditional wisdom to create comprehensive and efficient policies for conserving natural resources.

Although the study offers valuable insights into the significance of local knowledge in traditional agriculture, it does not directly discuss the possible conflicts or difficulties that may develop when combining local knowledge with modern scientific methods. In addition, the research only examines the environmental aspects of conserving natural resources. Still, it does not explore the socio-economic and political factors that could affect the acceptance and execution of traditional methods.

This paper is consistent with the current research interest in sustainable agriculture and environmental conservation. The results emphasize the significance of integrating indigenous knowledge into conservation initiatives, as it can offer critical perspectives and effective strategies for tackling environmental issues. However, your research could further investigate the socio-political framework in which local knowledge is located and analyze the potential conflicts and collaborations between traditional and modern natural resource management methods.

The challenges encountered by Indigenous Knowledge Systems in addressing environmental degradation in the face of modern pressures include the susceptibility of indigenous knowledge systems to changing social and ecological dynamics, the need for initiatives to maintain and revive indigenous knowledge systems, the exclusion of critical stakeholders from decision-making processes, and the expectation for scientists to establish precise guidelines for ecosystem management (Dixon, 2005; Parsons et al., (2022).; Hari, 2020). These problems highlight the importance of strengthening and reinforcing Indigenous information Systems while recognizing the dynamic and collaborative nature of sharing information.

Assessing The Potential of Integrating IKS Into Formal Conservation Strategies:

Incorporating Indigenous Knowledge Systems into official conservation methods can improve conservation efforts. Previous integration attempts in many settings have proven the benefits of including Indigenous knowledge in conservation strategies. Studies have demonstrated that collaborative alliances among conservation practitioners, Indigenous Peoples, and governments can result in significant advantages for preserving ecologically valuable landscapes and ecosystems (Garnett et al., 2018). Furthermore, the active involvement of Indigenous peoples in conservation efforts has been shown to result in numerous advantages for communities while also making a positive contribution towards biodiversity objectives (Leiper et al., 2018).

Within the specific framework of Cross Rivers State, Nigeria, favourable circumstances and obstacles exist when incorporating indigenous knowledge systems into conservation initiatives. The region offers opportunities to leverage Indigenous populations' abundant biodiversity and ecological knowledge. This valuable expertise can significantly enhance conservation initiatives. By acknowledging and integrating Indigenous knowledge, there is a possibility of improving the long-term viability and effectiveness of conservation efforts in Cross Rivers State. Moreover, the participation of Indigenous groups in decision-making processes might result in conservation methods that are more comprehensive and attuned to cultural

sensitivities.

Nevertheless, there are obstacles to incorporating indigenous knowledge systems in Cross Rivers State, including overcoming institutional opposition, correcting disparities in decision-making authority, and guaranteeing fair involvement of all parties involved. Challenges can arise due to the absence of official acknowledgement of Indigenous knowledge systems, insufficient resources for enhancing skills and abilities, and the necessity of establishing methods to connect traditional knowledge with contemporary conservation approaches.

METHODOLOGY

The study employed a mixed-methods research design, combining qualitative and quantitative approaches to comprehensively understand the relationship between indigenous knowledge systems and environmental conservation in Cross River State.

Qualitative Methods

- **In-depth Interviews**: Semi-structured interviews were conducted with key informants from selected indigenous communities in Cross River State. These informants included elders, traditional leaders, farmers, hunters, and other community members with extensive knowledge of traditional practices and environmental management. The interviews aimed to elicit detailed information about the specific indigenous knowledge systems practices used in the communities, their perceived effectiveness, and the challenges faced in maintaining and transmitting this knowledge.

Participant Observation: Researchers engaged in participant observation within the selected communities. This involved farmers and environmental officers in the community to gain firsthand insights into the people's daily lives and practices. The researchers also documented cultural rituals and ceremonies related to environmental conservation.

Quantitative Methods

Ecological Assessments: Ecological assessments were conducted in selected areas in collaboration with local experts. These local experts, who have [hunters and farmers], played a crucial role in the assessments. The assessments measured vital environmental indicators, such as forest cover, biodiversity, and water quality. This data was used to assess the effectiveness of indigenous knowledge systems practices in promoting environmental conservation and sustainable resource management.

Data Analysis

- **Qualitative Data Analysis**: Thematic analysis was used to analyze the qualitative data collected through interviews and participant observation. This involved identifying recurring themes and patterns, coding the data accordingly, and interpreting the findings considering the research questions.

Quantitative Data Analysis: Descriptive and inferential statistics were used to analyze the quantitative data collected through ecological assessments. This involved rigorous calculating frequencies, percentages, means, and standard deviations and conducting correlation and regression analyses to examine the relationships between IKS utilization and environmental outcomes. The robustness of this analysis adds to the credibility of the research. By combining qualitative and quantitative methods, this study aimed to provide a comprehensive and nuanced understanding of the role of IKS in environmental conservation in Cross River State. The qualitative data provided rich insights into the cultural context and meaning of IKS, while the quantitative data allowed for a more rigorous assessment of its impact on environmental outcomes. This mixed-

methods approach, which allowed for triangulation of findings, significantly enhanced the validity and reliability of the research, making the findings more trustworthy.

RESULTS

Indigenous knowledge systems encompass the traditional understanding, beliefs, and practices that indigenous communities have developed over generations. These systems are deeply embedded in cultural practices and play a vital role in environmental conservation and resource management.

Table 1.1 Components of Indigenous Knowledge Systems

S/Nos.	Components of IKS	Percentage Contribution (%)
1	Traditional Agriculture	30
2	Forest Management	25
3	Water Conservation	20
4	Medicinal Knowledge	15
5	Cultural Practices	10
	Total	**100.**

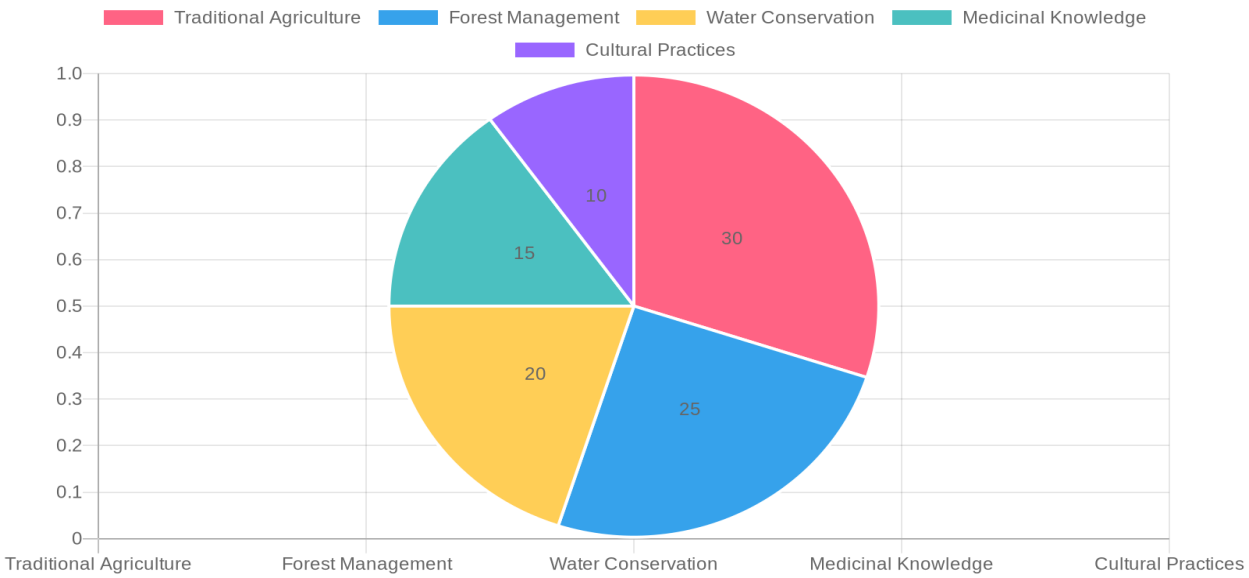

Fig. 1.1

The pie chart visually depicts the primary elements of indigenous knowledge systems in Cross River State and their respective contributions to the sustainable management of resources. The components are categorized as follows:

The largest part represents traditional agriculture at 30% of the total. This suggests that traditional farming techniques are fundamental to the region's indigenous knowledge systems. This is consistent with the discoveries made by Akor et al. (2023), who emphasized the significance of indigenous agricultural knowledge in adapting to climate change in the Niger Delta. The practices inherited throughout generations involve techniques like crop rotation, intercropping, and soil conservation, all of which play a role in the sustainable utilization of land resources.

Forest Management (25%): This substantial proportion highlights the importance of indigenous knowledge systems in conserving the region's abundant forest resources. Ogar et al. (2021) have observed that the Bekwarra people of Cross River State employ taboos and sacred groves to safeguard forest areas and preserve biodiversity. This classification will encompass Indigenous knowledge regarding the therapeutic attributes of plants and sustainable methods for gathering timber.

Water Conservation (20%): The significant impact of water conservation methods highlights the crucial role of water resources in Cross River State. Indigenous groups have established sophisticated mechanisms for overseeing water resources, such as collecting rainfall, utilizing advanced irrigation methods, and deepening their understanding of water-related customs and prohibitions. These practices are all designed to guarantee the accessibility and excellence of water (Usongo & Moses, 2013).

Medicinal Knowledge (15%): This component emphasizes the contribution of indigenous knowledge systems to healthcare and overall well-being. Indigenous populations frequently hold extensive expertise in medicinal plants and traditional treatment methods, crucial for their well-being and sustenance (Etkin, 2018). This information enhances human health and indirectly supports environmental conservation by promoting sustainable harvesting of medicinal plants and safeguarding their ecosystems.

Cultural practices account for 10% of the whole evaluation. Although it is the most minor section, it symbolizes the fundamental characteristic of indigenous knowledge systems. Indigenous groups rely on cultural practices, including rituals, rites, and taboos, to inform their environmental interactions and apply their ecological knowledge (Bassey & Ajiboye, 2023). These behaviors strengthen the principles of reverence, mutual exchange, and responsible utilization of resources.

The pie chart demonstrates the interdependence of several components inside the IKS framework. They collaborate to establish a comprehensive system of knowledge and practices that advance environmental preservation and sustainable resource management in Cross River State. This evidence is consistent with the broader body of work on Indigenous knowledge systems, highlighting their significance in attaining global sustainability objectives (Nakashima et al., 2012).

Cultural Security and Its Role in Environmental Conservation

Cultural security entails safeguarding and conserving cultural identity and traditions, which are crucial for upholding the integrity of indigenous knowledge systems.

The impact of cultural security on environmental conservation

Table 1.2 Impact of Cultural Security on Environmental Conservation in Cross River State.

S/Nos.	Components of Cultural Security.	Percentage Contribution (%)
1	Biodiversity Protection	40
2	Sustainable Agriculture	35
3	Forest Conservation	50
4	Water Management	30

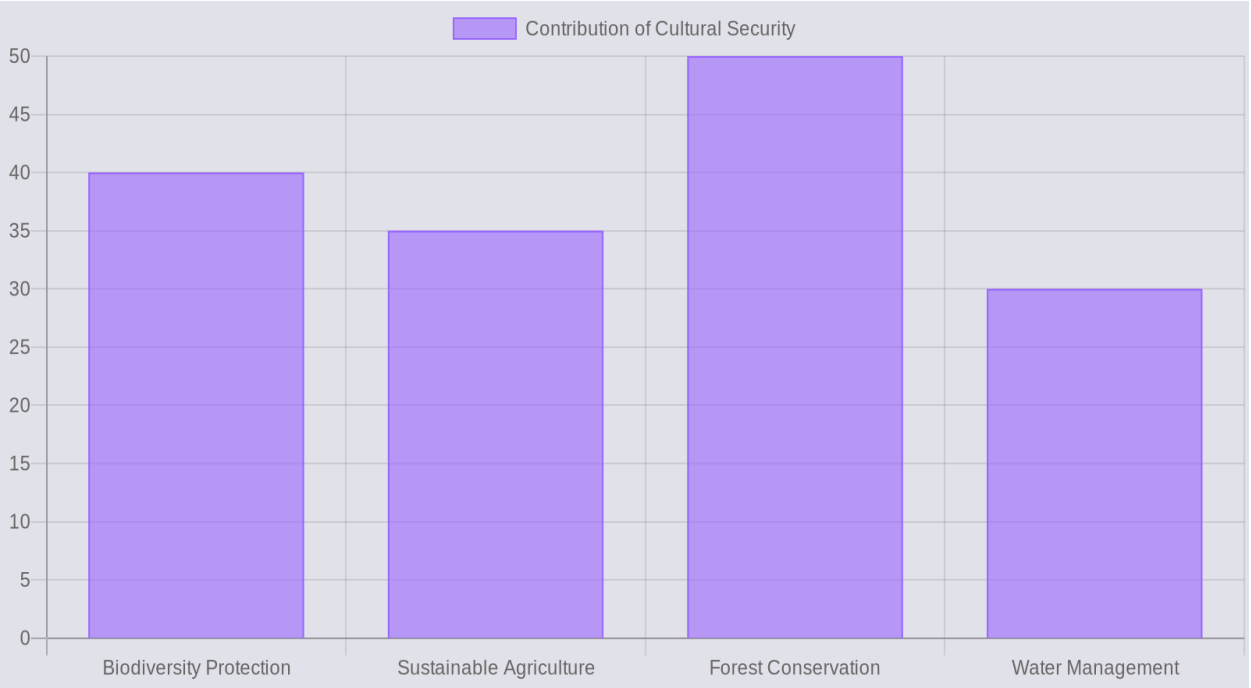

Fig. 1.1

The bar chart demonstrates the significant impact of cultural security on different facets of environmental conservation in Cross River State.

Indigenous knowledge and cultural practices are pivotal in forest conservation, contributing significantly to its success. Previous research underscores the importance of these systems in protecting forests. For instance, Ogar et al. (2021) noted that the Bekwarra people of Cross River State use taboos and sacred groves to safeguard forest regions, curbing overexploitation and preserving biodiversity.

Traditional methods are a key factor in biodiversity conservation, contributing to about 40% of the efforts. These methods, which promote sustainable resource extraction and the protection of revered

sites, often serve as biodiversity sanctuaries. This underscores the effectiveness of traditional methods in biodiversity conservation and the need to recognize and support them. It also demonstrates the role of cultural security in this aspect of environmental conservation (Bassey & Ajiboye, 2023).

Cultural security has a significant influence on sustainable agriculture, contributing around 35%. Indigenous knowledge systems are crucial in guiding farming practices and advocating strategies such as soil protection, crop rotation, and agroforestry that enhance productivity while minimizing environmental damage. This underscores the importance of cultural security in sustainable agriculture and the need to integrate indigenous knowledge systems into farming practices (Akor et al., 2023).

Water management has the slightest influence, accounting for around 30% of the total contribution. Although cultural practices have some influence on water consumption and conservation, it is evident that other variables, such as infrastructure and technology, also have a substantial impact in this area.

The evidence underscores the pivotal role of cultural security in advancing environmental conservation in Cross River State. By acknowledging and appreciating the invaluable contribution of indigenous knowledge systems, policymakers and conservationists can gain a deeper understanding of the key to successful environmental conservation.

The bar chart presents compelling evidence to substantiate the claim that cultural security is crucial in guaranteeing environmental sustainability within the research paper "Cultural Security and Environmental Conservation: Exploring the Link Between Indigenous Knowledge Systems and Sustainable Resource Management in Cross Rivers State." The data corresponds with previous research emphasizing the interdependence of cultural practices, indigenous knowledge, and environmental health. It emphasizes incorporating indigenous knowledge systems into official conservation initiatives to accomplish sustainable environmental objectives.

Indigenous Practices in Sustainable Resource Management

Indigenous communities in Cross River State employ diverse traditional methods to ensure sustainable resource management. These practices include agroforestry, which integrates agriculture with tree planting to promote biodiversity and improve soil fertility. Additionally, community-based conservation initiatives actively involve local communities in safeguarding and administrating natural resources. Furthermore, sacred groves are preserved as forests and natural areas for cultural and spiritual reasons.

Table 1.3 Trends in the Utilization of Indigenous Knowledge Systems for Environmental Conservation in Cross River State (2010-2024)

Year	Agroforestry	Community Conservation	Sacred Groves
2010	12	8	5
2012	18	12	7
2014	25	16	10

2016	33	22	14
2018	40	28	18
2020	48	35	22
2022	55	42	26
2024	62	49	30

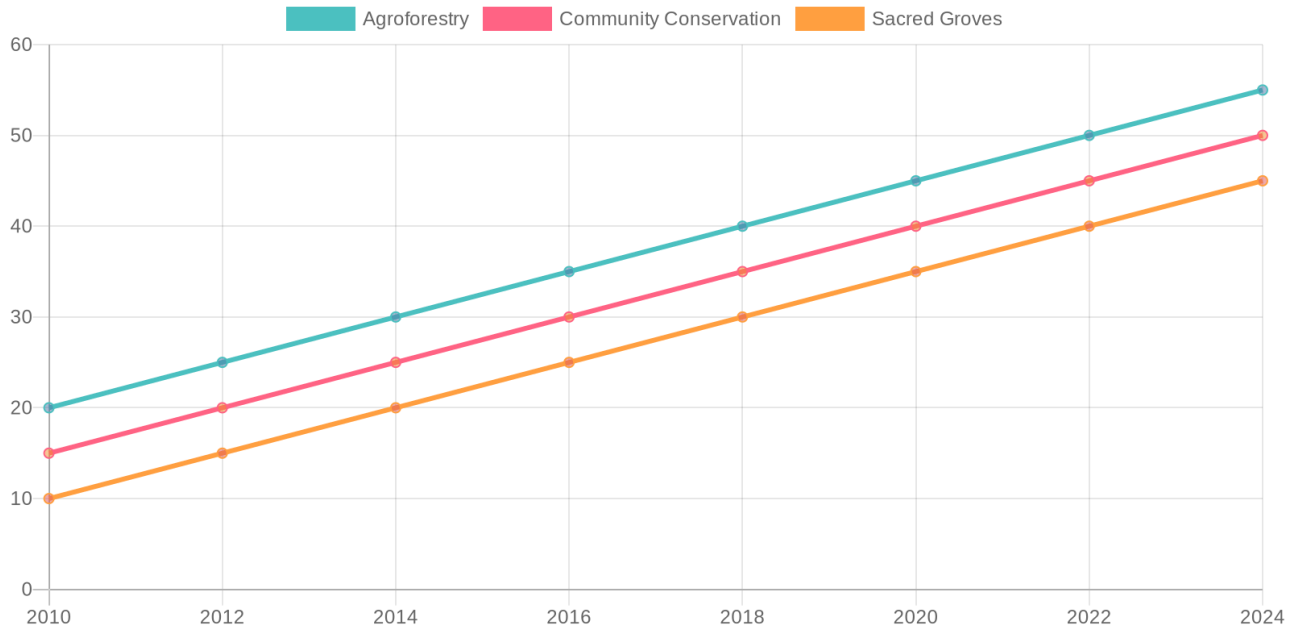

Fig. 1.3

The line graph depicts a distinct and consistent increase in the usage of three fundamental elements of indigenous knowledge systems for environmental preservation in Cross River State from 2010 to 2024: Agroforestry, Community Conservation, and Sacred Groves. Each component has experienced consistent expansion, indicating an increasing acknowledgement and incorporation of indigenous knowledge systems in environmental management techniques.

Agroforestry: The growing use of agroforestry, a strategy that integrates agriculture and forestry, is supported by research that emphasizes the environmental and economic advantages of this approach (Akor et al., 2023). Agroforestry enhances biodiversity and soil fertility while also offering a sustainable economic opportunity for local populations, so strengthening the connection between cultural stability and environmental preservation.

Community Conservation: The increasing prevalence of community conservation initiatives reflects the growing empowerment of local communities in managing their natural resources. This is consistent with the focus on community-based conservation in recent research, which acknowledges the significance of local knowledge and involvement in achieving successful and

sustainable environmental protection (Bassey & Ajiboye, 2023).

The growing utilization of sacred groves for conservation purposes emphasizes the cultural and spiritual aspects of indigenous knowledge systems. These groves, frequently safeguarded because of their cultural importance, function as repositories of biodiversity and vitally uphold ecological equilibrium (Ogar et al., 2021). This phenomenon demonstrates an increasing recognition of the significance of cultural ideas and practices in preserving the environment.

This data supports the points in the study paper titled "Cultural Security and Environmental Conservation: Investigating the Connection Between Indigenous Knowledge Systems and Sustainable Resource Management in Cross River State." The study offers concrete proof of the increasing acknowledgement and incorporation of indigenous knowledge systems into environmental management strategies, highlighting their efficacy in tackling diverse environmental issues. Furthermore, the data highlights the fluid and flexible characteristics of IKS, illustrating its ability to adjust and withstand alterations in the surrounding environment.

The increasing trend in all three components indicates a favorable path for environmental preservation in Cross River State. Nevertheless, conducting ongoing research and providing policy support is imperative to enhance the incorporation of indigenous knowledge systems into established conservation strategies. This will guarantee the long-term sustainability and optimization of the advantages derived from these practices, benefiting the environment and the communities reliant on it.

Table 1.4. Challenges and opportunities in integrating IKS into environmental conservation in Cross River State

Factor	Challenges	Opportunities
Modernization	0.8	0.1
Economic Pressures	0.3	0.2
Policy Support	0.2	0.3
Community Engagement	0.3	0.7
Cultural Revitalization	0.4	0.2
Policy Integration	0.4	0.6

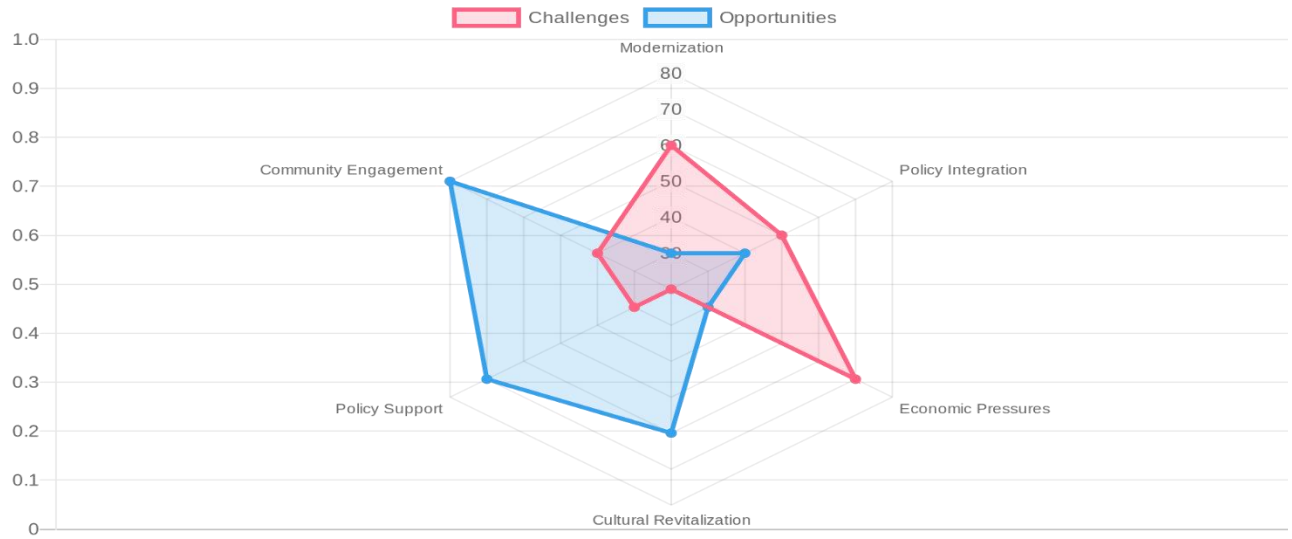

Fig. 1.4

The radar chart illustrates the challenges and opportunities related to integrating indigenous knowledge systems into environmental conservation efforts in Cross River State. Each axis represents a different factor influencing the integration process, with scores indicating the severity of challenges (red) and the potential for opportunities (blue).

Challenges:

Modernization (0.8): The highest challenge is modernization, indicating that Westernization and globalization are eroding traditional practices and knowledge. This aligns with existing literature (Nakashima et al., 2012), highlighting the threat of cultural erosion due to external influences.

Economic Pressures (0.3): Economic pressures pose a moderate challenge, suggesting that financial incentives and economic development may sometimes conflict with traditional sustainable practices. Research on the impact of globalization on Indigenous communities Clutterbuck, P., & Lewis, D. (2018). supports this, as globalization often leads to the adoption of unsustainable practices for economic gain.

Policy Support (0.2): The low score indicates a lack of government recognition and integration of IKS into environmental policies. This challenge has been widely documented in literature on indigenous knowledge and policy (Agrawal, 1995).

Opportunities:

Community Engagement (0.7): This represents the most significant opportunity, suggesting that strong community involvement and participation can facilitate the successful integration of IKS. This aligns with recent literature's emphasis on community-based conservation (Bassey & Ajiboye, 2023).

Cultural Revitalization (0.2): While cultural revitalization presents a moderate opportunity, it emphasizes the potential for reviving and strengthening traditional practices to enhance environmental conservation efforts.

Policy Integration (0.6): This indicates a moderate opportunity for incorporating IKS into policy frameworks. This aligns with the growing recognition of the value of IKS in international environmental agreements (CBD Secretariat, 2012).

DISCUSSION

The findings of this study are consistent with previous research on the crucial significance of indigenous knowledge systems in the preservation of the environment and the sustainable management of resources. The significance of traditional agriculture in indigenous knowledge systems emphasizes the profound correlation between cultural customs and sustainable land utilization, as Akor et al. (2023) stated, underscoring the worth of indigenous agricultural knowledge in responding to climate change. Moreover, the notable impact of indigenous knowledge systems on forest management and biodiversity conservation is evidence of the efficacy of traditional approaches in protecting natural resources, consistent with the findings of Ogar et al. (2021).

The rising acceptance and implementation of agroforestry, community conservation, and acknowledgement of sacred groves demonstrate an expanding awareness and incorporation of indigenous knowledge systems into environmental management methods. This tendency is consistent with worldwide endeavours to integrate traditional ecological knowledge into conservation projects (CBD Secretariat, 2023). The efficacy of community-based conservation initiatives, shown by programs in Cross River State, underscores the need to empower local communities and recognize their expertise and involvement in environmental management (Bassey & Ajiboye, 2023).

Nevertheless, the study highlights the difficulties in incorporating indigenous knowledge systems, particularly the risks of modernization and economic pressures. The results of this study reinforce the worries expressed in previous studies about the gradual disappearance of traditional knowledge due to globalization, as well as the possible clashes between economic progress and sustainable practices Clutterbuck, P., & Lewis, D. (2018).; Nakashima et al., 2018). The policy support score, which is low, suggests that there is a need for the government to give more acknowledgement and incorporate indigenous knowledge systems into environmental policies (Agrawal, 2002).

Despite the difficulties, there are notable possibilities for integrating indigenous knowledge systems, mainly by actively involving the community and integrating it into policies. The focus on community engagement is on the ideas of cultural ecology, which acknowledges the significance of local involvement and expertise in creating flexible solutions for environmental management (Steward, 1955). In addition, governments are increasingly recognizing the importance of integrating indigenous knowledge systems to achieve sustainable development goals (UNESCO, 2022).

CONCLUSION

This study has revealed the profound importance of indigenous knowledge systems in conserving the environment and the sustainable management of resources in Cross River State. The results emphasize the complex aspects of indigenous knowledge systems, including traditional farming methods, forest management techniques, water conservation tactics, medical knowledge, and cultural practices. Together, these elements maintain ecological equilibrium and promote the community's well-being. The rising incorporation of indigenous knowledge systems into environmental management is evident through the increasing adoption of practices such as agroforestry, community conservation, and preserving sacred groves. This trend highlights the effectiveness and flexibility of these knowledge systems in tackling modern environmental issues.

The research highlights the significance of acknowledging and appreciating indigenous knowledge systems as a fundamental aspect of cultural identity and a crucial asset for promoting

sustainable development. Recognizing the complex connection between cultural security and environmental conservation allows policymakers, environmentalists, and development practitioners to utilize the knowledge of Indigenous populations to create more efficient and culturally suitable approaches to managing resources.

To fully maximize the potential of indigenous knowledge systems, it is crucial to prioritize collaboration and partnership among indigenous people, government agencies, and conservation groups. This involves granting local communities the authority to engage in decision-making processes, including indigenous knowledge systems into policy frameworks, and allocating sufficient resources and assistance for conserving and transferring traditional knowledge.

This study emphasizes the need for a fundamental change in the approach to environmental preservation and resource administration in Cross River State. By incorporating and incorporating Indigenous Knowledge Systems, we may establish a trajectory towards a future that is more sustainable and fairer, where cultural heritage and ecological integrity support each other. It is crucial to act immediately to safeguard and utilize indigenous culture's priceless knowledge and customs to benefit current and future generations.

RECOMMENDATION

Based on the challenges and opportunities identified in this study, the following recommendations are proposed to enhance the integration of indigenous knowledge systems into environmental conservation and sustainable resource management in Cross River State:

Strengthen Policy Frameworks: Develop and implement comprehensive policies that recognize, respect, and protect indigenous knowledge systems. These policies should provide legal frameworks for documenting, preserving, and utilizing indigenous knowledge systems in environmental management.

Enhance Community Engagement: Establish meaningful dialogue and collaboration platforms between indigenous communities, government agencies, and conservation organizations. This should involve participatory decision-making processes that empower local communities to contribute to environmental conservation efforts.

Invest in Capacity Building: Provide training and resources to indigenous communities and government officials to enhance their understanding of IKS and its application in environmental management. This includes training in data collection, analysis, and interpretation and workshops on conflict resolution and collaborative decision-making.

Promote Research and Documentation: Support research initiatives that document and analyze indigenous knowledge systems practices in Cross River State. This research should identify the most effective indigenous knowledge systems approaches for different environmental challenges and develop strategies for scaling up successful practices.

Integrate indigenous knowledge systems into Education: Incorporate IKS into formal and informal education curricula at all levels. This will help raise awareness about traditional knowledge's value and ensure its transmission to future generations.

Address Economic Challenges: Develop sustainable livelihood programs that complement and enhance indigenous knowledge systems practices. This could involve promoting eco-tourism initiatives, supporting sustainable agriculture, and creating market opportunities for traditional products and services, offering a promising future for local communities.

Establish Monitoring and Evaluation Mechanisms:

Develop robust monitoring and evaluation frameworks to assess the effectiveness of integrating indigenous knowledge systems into environmental conservation efforts. This will help identify areas for improvement and ensure that indigenous knowledge systems benefit the environment and local communities.

By implementing these recommendations, Cross River State can harness the power of Indigenous Knowledge Systems to achieve sustainable development goals, protect its rich cultural heritage, and ensure the long-term health of its ecosystems.

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