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Prof. A.F. Fatusin

Editor

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HUMAN-NATURE RELATIONSHIPS AND THEIR IMPLICATIONS FOR ECOSYSTEM-BASED MANAGEMENT: A REVIEW

Henry Ojobo[1]*, Oluwagbemiga Paul Agboola[2], and Lukman Muazu Lukman[3]

[1]Department of Architecture, Faculty of Architecture, Kaduna State University, Kaduna. Nigeria.
[2]Faculty of Engineering and Architecture, Department of Architecture. Istanbul Gelisim University, Istanbul, 34310, Turkey
[3]Department of Architecture, Faculty of Architecture, Kaduna State University, Kaduna. Nigeria.

*Corresponding author's email: henry.ojobo@kasu.edu.ng, Tel. 08035901967

Abstract

In the face of global transformations, population expansion, and escalating urbanization, the profound impact on both social systems and ecosystems necessitates effective nature-based solutions. Despite the increasing significance of understanding the intricate interplay among nature, ecosystems, and well-being, a notable research gap persists in this domain. This paper aims to address this gap by conducting a comprehensive review that encompasses human-nature relationships. The primary objective is to provide a nuanced understanding of human connectedness to nature and its implications for ecosystem-based management. To unravel the interactive dynamics of resolving ecological challenges, a systematic literature review spanning the years 2005 to 2024 is undertaken, drawing from 28 peer-reviewed publications indexed in Scopus and Google Scholar. Employing thematic analysis, this study categorizes and synthesizes relevant literature, thereby revealing recurring themes, patterns, and trends. The findings underscore three essential dimensions: first, enhance our understanding of the intricate ways individuals perceive and interact with the natural environment; second, illuminate the broader societal and psychological impacts of strategies employed for ecological conservation and management; and third, development of comprehensive strategies that consider the diverse dimensions of human-environment interactions. This study serves as a valuable reference for future research endeavors seeking to address ecological challenges by providing a comprehensive overview of the existing evidence and delineating potential avenues for further exploration.

Keywords: Environment, Ecosystem Services; Connectedness to nature, Well-Being, Thematic analysis

1.0 INTRODUCTION

Ecosystem-based management (EBM) is a crucial approach recognizing complex ecosystem interconnections, aiming to harmonize human activities with natural system health and sustainability (Delacámara et al., 2020; Hou et al., 2021). This method, increasingly pivotal in environmental stewardship, embraces a forward-thinking perspective. The intricate ecosystem network, noted for its complexity (Bodin, 2017), is now a focal point amid global environmental challenges. Responding to these challenges, there is growing interest in nature-based solutions, acknowledging ecosystems' essential role in building resilience, sustainability, and adaptive capacity (Liu et al., 2022). Yet, understanding the intricate interplay of elements, processes, and structures within the ecosystem remains a formidable challenge. The Ecosystem Services and Human Well-being framework, initiated by the Global Land Project (Moran et al., 2005) and

Future Earth, clarifies the complexity by intertwining driver changes, ecosystem services, and human well-being. It serves as a platform where land use/land cover change (LUCC) assessment acts as a bridge between ecosystem analysis and human well-being. This clarification unveils intricate human-natural system interactions, improving our understanding of ecosystem service processes, facilitating comprehension of regional ecological changes. It also forms a foundation for shaping land use planning and ecological protection policies (Hou et al., 2021), holding scientific significance in advancing regional sustainable development.

Research on ecosystem services and human well-being has mainly focused on their connections (Agboola et al., 2023; Yang et al., 2021; Summers et al., 2012). Wu (2019) and Clerici et al. (2019) explored the impact of ecosystem structure and function, highlighting the need to identify and synthesize linkages due to the complex relationships involved. Human activities over the last fifty years have caused positive and negative transformations in ecosystems, emphasizing the necessity for sustainable practices. The alterations, while positively impacting human well-being, have also reduced ecosystem size and integrity, posing a threat to service sustainability. This trend, driven by land use change influenced by socio-cultural and economic factors (Iniesta-Arandia et al., 2014; Quintas-Soriano et al., 2016; Schirpke et al., 2020), may have adverse effects on human well-being. The concept of human well-being is intricate, covering various aspects influenced by cultural, social, economic, and environmental factors (Liu et al., 2022; Dasgupta, 2001; Woodhouse et al., 2015).

Subjective well-being, shaped by individual traits, social relations, economic conditions, and environmental determinants (Abdullahi et al., 2020; Farahnaz Sharifi et al., 2021), is influenced by factors like personality, social connections, economic circumstances, and the living environment (Lucas and Diener, 2009; Holder and Coleman, 2009; Easterlin, 1974; Hiscock et al., 2017; Douglas et al., 2019). Human connectedness to nature involves emotional, psychological, and physical ties, impacting well-being. Childhood experiences and environmental education contribute to a lasting appreciation for the environment (Wells, 2000; Chawla, 1998). The concept of biophilia suggests an innate human tendency to seek connections with the natural world (Wilson, 1984; Beery et al., 2015; Klotz & Bolino, 2021). Access to green spaces significantly influences connectedness to nature, impacting recreation, well-being, social cohesion, and urban aesthetics (Nisbet et al., 2020; Samus et al., 2022; Kaplan & Kaplan, 1989).

Nature experiences contribute to connectedness, creating a positive feedback loop (Agboola et al., 2023; Hartig et al., 2014). Those with higher connectedness are more likely to engage in environmentally conscious activities (Martin et al., 2020; Schultz, 2002). This study focuses on human connectedness to nature for ecosystem-based management in the diverse Kaduna metropolis, emphasizing the importance of understanding inhabitants' relationships with their natural environment for sustainable urban development and effective conservation (Dawson et al., 2021). Individual values, perceptions, and connections with nature impact the acceptance of ecological interventions, influenced by socio-economic status, political and religious beliefs, education, income, and reliance on natural resources (Bennett, 2016; Alikhanova et al., 2024).

The purpose of the study is to present the significance of understanding human connectedness to nature and its relevance to ecosystem-based management in Kaduna, the northern part of Nigeria. This study is centered on reviewing the socio-cultural appraisal of natural resources within local communities and establishing the connections between ecosystems and human well-being. This emphasis aligns with the core tenets of nature-based solutions, which strive to comprehensively integrate societal priorities into nature-recovery initiatives, ensuring sustainable benefits for both society and the environment. The research objectives include: i) exploring the concept of human connectedness to nature in Nigeria; ii) reviewing the implications of nature for ecosystem-based management in Nigeria; iii) review the perception of the human natural environment and its impact on their well-being.

This research addresses the gap by highlighting connections between residents' well-being and ecosystems, offering potential for culturally sensitive ecosystem-based management strategies tailored to the region's socio-cultural dynamics. It contributes insights into human-nature relationships in the built environment, informing policy formulation and practice. By exploring human connectedness to nature and its implications for ecosystem-based management,

the study guides sustainable practices promoting both environmental conservation and residents' well-being. The subsequent sections detail the research methodology (section two), present and discuss findings (section three), and draw conclusions, recommendations, and future research (section four).

2.0 Ecosystem-Based Management, Subjective Well-being, and Connectedness to Nature

The interconnectedness of ecosystem-based management, subjective well-being, and connectedness to nature has garnered increased attention in recent interdisciplinary research. Ecosystem-based management (EBM) stands as a holistic approach to environmental governance, emphasizing the interconnectedness of ecological, social, and economic systems. Numerous studies underscore the effectiveness of EBM in sustaining biodiversity, enhancing ecosystem resilience, and promoting long-term environmental sustainability (Samhouri, et.al., 2010; Arkema et al., 2006). By integrating ecological, social, and economic considerations, EBM strives to balance conservation goals with the needs of human communities.

Subjective well-being, often measured through indicators like life satisfaction, happiness, and positive affect, has become a central focus in understanding the broader impacts of environmental management strategies. Research indicates that exposure to well-managed ecosystems positively influences individuals' mental health and overall life satisfaction (Bratman et al., 2019; Capaldi et al., 2015). The integration of natural elements into urban planning and conservation initiatives has shown promise in contributing to psychological well-being (Summers, et. al, 2012).

Connectedness to nature represents an individual's emotional and experiential relationship with the natural world. This concept, often assessed through various scales and indices, has been linked to pro-environmental behaviors, psychological well-being, and overall life satisfaction (Mayer & Frantz, 2004; Nisbet et al., 2009). Ecosystem-based management practices, by promoting sustainable and harmonious interactions with nature, are posited to enhance individuals' connectedness to the natural environment.

The intersection of these three domains reveals nuanced implications for both individuals and communities. Ecosystem-based management practices, when successfully implemented, contribute positively to individuals' subjective well-being by providing aesthetically pleasing and psychologically restorative environments (Bratman et al., 2019). Moreover, fostering a sense of connectedness to nature through EBM aligns with the emerging concept of nature-based solutions, where ecological restoration and conservation efforts are integrated into urban planning to enhance both environmental and human well-being (Colding, & Barthel, 2019).

Ecosystem services, a key component of EBM, are intricately linked to subjective well-being. Access to natural spaces and biodiversity, preserved through EBM, provides essential services such as clean air, water, and recreational opportunities, contributing directly to individuals' quality of life and subjective well-being (Daily et al., 2009; Bratman et al., 2019). Connectedness to nature emerges as a mediator between EBM and subjective well-being. EBM practices that prioritize environmental health and biodiversity contribute to a more immersive and positive experience of nature, subsequently enhancing individuals' connectedness to the natural world (Zhang et al., 2020). This interconnectedness reinforces the notion that the benefits derived from well-managed ecosystems extend beyond ecological sustainability to influence the psychological and emotional well-being of individuals.

3.0 MATERIAL AND METHODS

3.1 Study area

Kaduna metropolis, situated in the heart of Nigeria, serves as a focal point for understanding human connectedness to nature in the context of ecosystem-based management. This bustling urban center, with its unique blend of cultural diversity, economic activities, and ecological nuances, provides an intriguing backdrop for investigating the intricate relationships between the local populace and the natural environment. The geographical and cultural context

of Kaduna metropolis (Figure 1) is strategically located in the North-western part of Nigeria, acting as the capital of Kaduna State. Nestled along the Kaduna river, the city boasts a diverse topography, encompassing both urban landscapes and pockets of natural greenery. Its geographical features contribute to a rich tapestry of ecosystems within and surrounding the metropolis, making it an ideal setting to explore the dynamics of human connectedness to nature. As revealed by Maiangwa, (2021), culturally, Kaduna is a melting pot, with a mosaic of ethnic groups coexisting harmoniously. The various communities within the metropolis bring distinct perspectives and practices that shape their relationship with the environment. Understanding the cultural fabric of Kaduna is crucial for unraveling the intricacies of human-nature connections and, consequently, for devising effective strategies for ecosystem-based management.

The economic vibrancy of the Kaduna metropolis is underscored by its role as a major trade and industrial hub. Economic activities, ranging from manufacturing to services, significantly impact the surrounding ecosystems. The delicate balance between economic development and environmental preservation poses challenges that necessitate a nuanced understanding of how the local population perceives and interacts with their natural surroundings. Furthermore, Kaduna, like many urban centers, faces environmental challenges such as pollution, deforestation, and habitat degradation. These issues underscore the urgency of adopting ecosystem-based management strategies that not only address ecological concerns but also resonate with the values and perceptions of the people inhabiting the metropolis.

In connection with the human-nature interaction; in the heart of Kaduna metropolis, the social fabric is tightly woven with nature. Parks, green spaces, and the Kaduna river offer residents places for recreation, reflection, and community gatherings. Exploring how individuals and communities in Kaduna utilize and perceive these natural spaces provides valuable insights into the broader concept of human connectedness to nature. Moreover, the reliance of certain communities on natural resources for livelihoods adds another layer to the complex interplay between humans and their environment. The intricate web of daily life, cultural practices, and economic pursuits shapes the way people in Kaduna connect with and depend on the ecosystems around them.

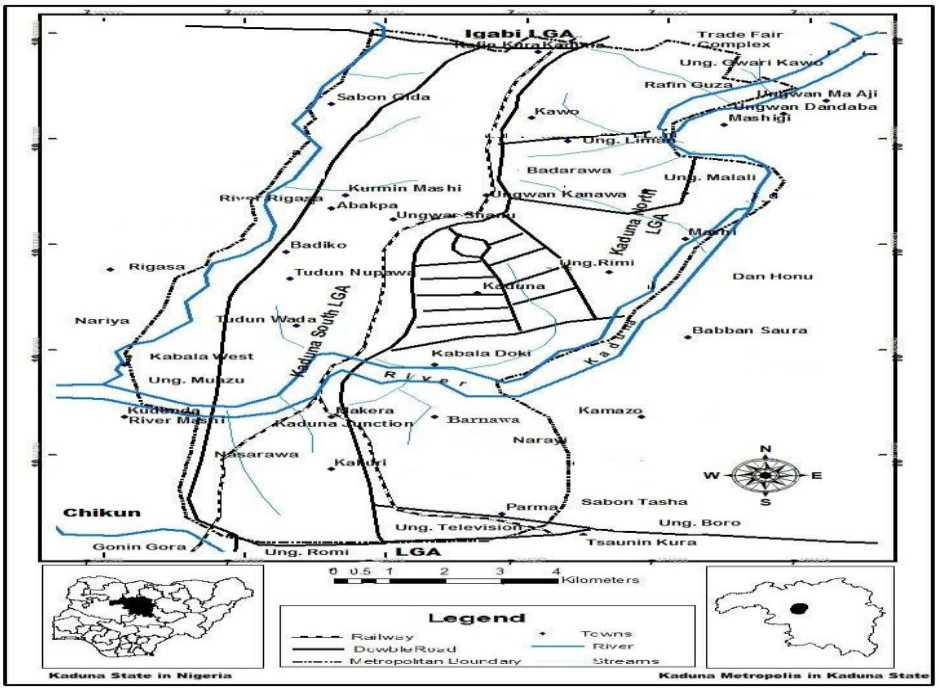


Figure 1: Map of Kaduna. **Source**: Ojobo, et. al., (2024).

3.2 Qualitative Study Design and Justification

In this research, a structured scoping review and thematic analysis approach were utilized, drawing from the tradition of critical discourse analysis. The aim was to elucidate the conceptual and theoretical relationship between the interconnections between nature, the ecosystem, and well-being (Abdullahi et.al., 2020). To achieve the stated objectives, a systematic search strategy was employed. Key databases will be selected for a comprehensive literature review, and inclusion and exclusion criteria will guide the selection of relevant studies. This meticulous approach aims to ensure the inclusion of studies that contribute substantively to the exploration of the study. Structured scoping reviews aim to swiftly outline the fundamental concepts underpinning a research area, along with the primary sources and types of evidence available. In direct alignment with these methodologies, our scoping review endeavors to summarize and disseminate research findings. The screening process involves a two-tiered approach, initially based on titles and abstracts and subsequently on full-text assessments. Following this was the data extraction conducted systematically, capturing relevant information on the study design. This approach aims to distill the vast body of literature into a coherent and informative synthesis. Overall, the study's approach adheres to the five-step process outlined by Arksey & O'Malley (2005), encompassing: (i). identifying pertinent studies; (ii). Selecting studies and sorting out texts into themes; and (iii). collating, summarizing, and reporting the results. The decision to employ a structured scoping review and thematic analysis approach in this study, firmly grounded in the tradition of critical discourse analysis, is underpinned by several key justifications. This chosen design aligns seamlessly with the research goals, providing a robust framework for elucidating the research objectives within the specific context of the Kaduna metropolis (Abdullahi et al., 2020).

The choice of a structured scoping review methodology is justified based on several key considerations. First, the comprehensive exploration inherent in this approach aligns well with the multifaceted nature of the conceptual and theoretical relationships between green space and subjective well-being. In undertaking a scoping review, the research aims to cast a wide net across a diverse body of literature, ensuring the inclusion of various perspectives and insights. This inclusivity is deemed essential for acquiring a nuanced understanding of the subject, particularly within the specific context of the Kaduna metropolis. The structured scoping review methodology provides the necessary flexibility to accommodate the breadth of evidence available, facilitating a holistic examination of the intricate interplay between green spaces and subjective well-being.

Second, the choice of a structured scoping review is motivated by the need for a swift yet comprehensive overview of fundamental concepts. This methodology is specifically designed to offer a rapid but thorough examination of the foundational principles within a given research area. In the context of our study, this swift overview is invaluable, allowing for the efficient identification and delineation of key themes, concepts, and variables associated with the relationship between green space and subjective well-being. Given the extensive literature available on this complex subject, the expedited nature of scoping reviews becomes a practical and strategic advantage, enabling the synthesis of essential information within a reasonable timeframe.

In essence, the justification for employing a structured scoping review methodology lies in its ability to address the intricate and multifaceted nature of the research topic. This approach facilitates a comprehensive exploration of a broad range of literature, ensuring a thorough understanding of the subject within the specific geographic and socio-cultural context. Simultaneously, the swift overview provided by the scoping review methodology aligns with the need for efficiency in summarizing the extensive body of knowledge surrounding the relationship between green space and subjective well-being. Together, these justifications underpin the appropriateness of the selected methodology for achieving the study's objectives in the context of the Kaduna metropolis.

The structured scoping review and thematic analysis approach is grounded in critical discourse analysis traditions and serves as a methodologically robust and justified design for our study. Its efficiency in providing a comprehensive overview, alignment with research goals,

incorporation of critical perspectives, and adherence to a transparent methodology collectively contribute to the validity and reliability of our exploration into the relationship between green space and subjective well-being in the unique context of the Kaduna metropolis.

As shown in Fıgure 2, The thematic review process initiated with a clear delineation of the study's objectives, which encompassed three focal areas: human connectedness to nature and its implications for ecosystem-based practices, the exploration of ecosystem-based management, and an investigation into the perceptions surrounding natural resources and their impact on well-being. Each objective constituted a distinct theme within the overarching research framework. To execute the research method effectively, a comprehensive searching strategy and data collection plan were devised. Utilizing NVIVO Version 12, a total of 28 manuscripts full-texts were subjected to rigorous review. These are peer-reviewed publications indexed in Scopus and Google Scholar from years 2005 to 2024. Three manuscripts that failed to meet the predefined inclusion criteria were judiciously excluded from the analysis, resulting in a refined dataset for thematic exploration.

Following the meticulous curation of pertinent literature, the next phase involved sorting these materials into thematic categories. Theme 1 delved into the complex realm of human connectedness to nature, synthesizing insights from eight distinct studies. Theme 2 concentrated on ecosystem-based management, aggregating findings from a comparable number of eight sources. Lastly, Theme 3 focused on the perceptions surrounding natural resources and their correlations with well-being, integrating perspectives from seven scholarly contributions. For objective one, the terms that were used to search the literature in the search engine include the following: biophilia, ecopsychology, nature deficit disorder, environmental identity, cultural values, and perceptions. The search terms for the associated second objectives of ecosystem-based management and its implications include psychological well-being, cultural significance, community resilience and adaptation, acceptance of conservation measures, and environmental decision-making. For objective three concerning the significance of nature-based solutions, the search terms include biodiversity conservation, climate change mitigation and adaptation, ecosystem services, and human well-being among others.

The final stages of the thematic review process encompassed the collation, summarization, and reporting of key insights derived from each theme. By organizing the diverse findings, the research aimed to distill overarching trends, identify critical gaps in current knowledge, and illuminate areas of consensus or contention within the literature. This structured approach not only provided a comprehensive overview of the selected themes but also facilitated a nuanced understanding of the broader implications for the study's objectives. Through these successive steps, the thematic review process emerged as a systematic and insightful method for synthesizing knowledge on the intricate relationships between human behavior, ecosystem management, and well-being perceptions.

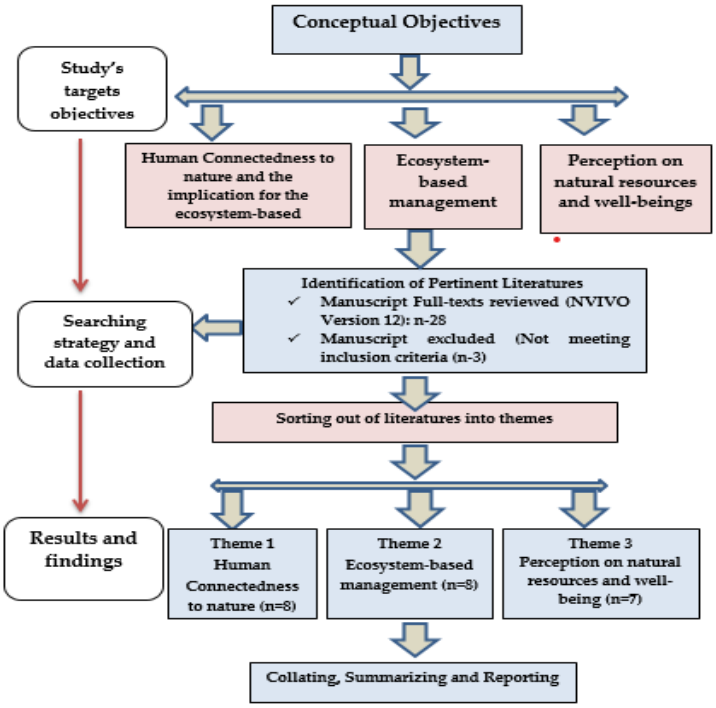


Figure 2. Flow-line of the Thematic Review Process. **Source**: Author's Conceptualisation.

4.0 RESULTS AND DISCUSSION

4.1.1 Objective 1a: Human connectedness to nature

The findings from the thematic review process in relation hold significant implications, particularly about past studies, notably those exploring the concept of biophilia. Biophilia, as highlighted by Levy (2003), is a concept that underscores the innate, evolutionary tendency of humans to seek connections with nature and other living organisms. This paradigm, initially articulated by Wilson (1984) and later supported by scholars like Klotz and Bolino (2021), posits that humans possess a fundamental affinity for the natural world. The thematic review process, which specifically delved into the theme of human connectedness to nature, aligns closely with the principles of biophilia. The preference for natural landscapes and the documented restorative effects of nature on mental health, both highlighted within the thematic review, substantiate and extend the tenets of biophilia. The reviewed literature provides a nuanced understanding of the various dimensions of human-nature relationships, shedding light on the diverse ways in which individuals connect with and derive well-being from their natural surroundings. This resonance with the biophilic concept strengthens the empirical foundation of past studies on biophilia by offering a contemporary and comprehensive synthesis of literature that underscores the enduring and multifaceted nature of the human-environment connection.

The outcomes of the thematic review process carry profound implications in the context of past studies, particularly those within the realm of ecopsychology. Ecopsychology, as defined by Jordan et al. (2016), investigates the psychological relationship between humans and nature, specifically focusing on how interactions with the natural environment influence mental health. This field emphasizes the reciprocal influence between individuals and the ecosystems they inhabit, positing that a harmonious relationship with nature is crucial for overall well-being. The thematic review's exploration of human connectedness to nature aligns seamlessly with the fundamental tenets of ecopsychology. By scrutinizing literature that delves into the intricate dynamics between individuals and their natural surroundings, the thematic review provides empirical support for the claims made by ecopsychological studies. The emphasis on ecosystem-

based management within the reviewed themes further reinforces the reciprocal nature of the human-environment relationship, as acknowledged by ecopsychology. Moreover, the thematic review's attention to the perceptions of natural resources and their impact on well-being directly resonates with the goals of ecopsychology, which seeks to understand and promote the psychological benefits of nature immersion. The collation of findings regarding the restorative effects of nature on mental health, a theme highlighted within the review, strengthens the argument put forth by ecopsychology regarding the positive psychological outcomes associated with a harmonious engagement with the natural environment.

The implications of the thematic review process, especially concerning human connectedness to nature, hold particular relevance in the context of past studies, notably those related to the concept of nature deficit disorder. Coined by Louv (2005), nature deficit disorder suggests that the lack of exposure to nature in modern, urbanized societies can contribute to behavioral and health issues. This concept underscores the crucial role of regular contact with nature in maintaining overall well-being. The thematic review's focus on human connectedness to nature and the psychological benefits of nature immersion directly aligns with the principles embedded in the concept of nature deficit disorder. By exploring literature that highlights the positive impact of nature on mental health, the review reinforces and extends the arguments made by studies associated with nature deficit disorder. The themes of ecosystem-based management and perceptions of natural resources further contribute to the discourse, emphasizing the multifaceted ways in which a connection with nature can be established and maintained. Moreover, the thematic review's recognition of the potential consequences of a society becoming increasingly detached from the natural world resonates with the core concerns raised by nature deficit disorder. The call within the review for incorporating nature experiences into daily life for improved mental and physical health echoes the recommendations made by Louv and other scholars in addressing the challenges posed by modern lifestyles that are often devoid of sufficient contact with the natural environment.

The findıngs of the thematic review process, particularly concerning human connectedness to nature and perceptions of natural resources, hold noteworthy implications in the context of past studies on environmental identity. Environmental identity, as defined by Clayton et al. (2017), refers to the extent to which an individual incorporates nature into their self-concept. This concept involves a profound sense of belonging to the natural world and can significantly influence attitudes, behaviors, and decisions related to environmental issues. The thematic review's exploration of human connectedness to nature directly aligns with the essence of environmental identity. By delving into the literature that examines the depth of individuals' connections with nature, the review substantiates and expands upon the core elements of environmental identity. The themes related to ecosystem-based management and perceptions of natural resources further contribute to this alignment by shedding light on the diverse ways in which individuals form and express their environmental identity. Furthermore, the review's attention to the implications of human-nature relationships for overall well-being resonates with the broader goals of environmental identity studies. The understanding gained from the thematic review regarding the positive effects of nature on mental health and the reciprocal relationship between individuals and ecosystems contributes to the discourse on the multifaceted dimensions of environmental identity formation. In essence, the thematic review not only aligns with the principles of environmental identity but also enriches the discourse by providing a contemporary synthesis of literature. The implications of this alignment extend beyond validation, contributing to the ongoing dialogue on the crucial role of environmental identity in promoting sustainable behaviors, fostering a sense of responsibility, and encouraging conservation efforts. The thematic review serves to reinforce and expand upon the foundational concepts put forth by past studies on environmental identity, advancing our understanding of the intricate interplay between human identity and the natural environment.

4.1.2 Objective 1b: The Nexus between humans and nature as a pivotal role in shaping the success of ecological interventions and conservation initiatives.

The exploration of perceptions of natural resources and well-being is closely tied to the significant body of past studies on cultural values and perceptions. According to Berkes et al. (2008) and Chan et al. (2016), communities' cultural values and perceptions play a pivotal role in influencing their relationship with nature and shaping their attitudes toward conservation initiatives. The understanding of these cultural nuances is deemed essential for the effective design and implementation of conservation programs that align with local beliefs. The thematic review's emphasis on sorting out kinds of literature into themes, including perceptions on natural resources and well-being, aligns seamlessly with the foundational principles of cultural values and perceptions studies. By delving into the literature that explores how communities perceive and interact with their natural surroundings, the review provides a nuanced understanding of the cultural dynamics that shape environmental attitudes. The attention to the cultural aspects of human-nature relationships enriches the discourse on conservation by highlighting the importance of incorporating cultural values into the planning and execution of conservation strategies. Moreover, the thematic review's recommendation to tailor conservation strategies to be more culturally sensitive echoes the key findings of past studies in this domain. By respecting and integrating local cultural values, conservation efforts stand a better chance of gaining acceptance and achieving success within the community. The review, through its thematic exploration, underscores the practical implications of this cultural sensitivity, reinforcing the idea that acknowledging and incorporating cultural values can enhance the effectiveness and sustainability of conservation programs.

The thematic review process addresses perceptions of natural resources and well-being and has profound implications for past studies on socio-economic factors. Thıs ıs ın lıne wıth Plieninger et al. (2016) and Barbier et al. (2009) identified socioeconomic status, income levels, and reliance on natural resources as the critical determinants influencing how individuals and communities interact with their environment. Understanding these socio-economic factors is deemed crucial for the development of sustainable interventions that address the economic dimensions of human-nature relationships. The thematic review's attention to the perceptions of natural resources and their impact on well-being aligns closely with the core tenets of studies on socio-economic factors. By exploring how socio-economic considerations influence the way communities perceive and engage with their natural surroundings, the review contributes to the ongoing dialogue on the complex interplay between economic dynamics and human-nature relationships. The themes related to ecosystem-based management and human connectedness to nature further enhance this understanding by shedding light on how economic factors intersect with broader environmental issues. Furthermore, the thematic review's recommendation to integrate economic considerations into conservation planning resonates with the practical insights derived from past studies. By acknowledging and incorporating the economic realities of communities, conservation interventions are more likely to be realistic, viable, and accepted by the affected populations. The review underscores the importance of aligning conservation strategies with the socio-economic context, emphasizing that sustainability is contingent upon recognizing and addressing the economic aspects of human-nature relationships.

Studies by McCool & Guthrie (2001) and Reed et al. (2016) underscore that the success of conservation initiatives is intricately tied to the views and acceptance of local communities. The perspectives of these communities regarding ecosystems, wildlife, and natural resources significantly influence the level of acceptance and cooperation in ecological interventions. This thematic review's exploration of perceptions of natural resources aligns seamlessly with the central tenets of studies on community-based conservation. Hence, the study contributes to the ongoing discourse on the critical role of community perspectives in conservation success, as related to ecosystem-based management and human connectedness to nature. This enriches the understanding of how community views intersect with broader ecological interventions. Fındıngs align with the conservation initiatives, incorporating traditional ecological knowledge, and involvement of communities in decision-making processes in tandem with the key findings of Ellis, (2005) and Pilbeam, et. al., (2019). By respecting and integrating local knowledge and

involving communities in conservation decision-making, the likelihood of positive and sustainable outcomes increases.

The implications drawn from the thematic review process, particularly the exploration of perceptions on natural resources and well-being, are highly significant in the context of past studies concerning human well-being and ecosystem health. The concept that the well-being of individuals is intricately linked to the health of ecosystems establishes a reciprocal relationship, as emphasized by researchers such as Myers and Patz (2009) and Frumkin et al. (2017). Understanding this interdependence is essential for designing interventions that promote both ecological sustainability and community health. The thematic review aligns closely with the principles of human well-being and ecosystem health studies by focusing on the interconnectedness between human perceptions, well-being, and the health of ecosystems. By exploring literature that delves into the reciprocal relationship between communities and their natural environment, the review contributes to the ongoing discourse on the critical linkages between ecological sustainability and human health. The thematic exploration, particularly regarding ecosystem-based management and human connectedness to nature, enriches the understanding of how conservation strategies can positively impact both the environment and the well-being of communities. Moreover, the thematic review's emphasis on conservation strategies that prioritize the health of ecosystems echoes the core findings of past studies. By recognizing and addressing the health of ecosystems, conservation initiatives contribute not only to environmental sustainability but also to the overall well-being of communities relying on these ecosystems for their livelihoods. The review underscores the practical implications of adopting an integrated approach that considers both ecological and human dimensions in conservation planning.

The study drawn from the thematic review process, with emphasis on perceptions of natural resources and well-being, aligns closely with past studies of Kollmuss & Agyeman (2002) and Chawla (1998). These revealed the levels of education and environmental awareness significantly influence individuals' perceptions and interactions with nature. Recognizing this, promoting environmental education emerges as a crucial strategy for fostering a deeper understanding of ecological processes and cultivating informed and supportive communities for conservation initiatives. This contributes to the ongoing discourse on the connections between education, environmental awareness, and human-nature relationships. The thematic exploration, particularly regarding human connectedness to nature and ecosystem-based management, enriches the understanding of how educational interventions can positively influence perceptions and behaviors related to the environment. The review reinforces the idea that fostering environmental awareness through education lays the groundwork for creating communities that are actively engaged in and supportive of conservation efforts. Education not only imparts knowledge but also equips individuals with the tools to actively participate in conservation efforts, creating a foundation for long-term environmental stewardship.

4.2.0. Objective 2: Ecosystem-based Management and its Implications

The thematic review process, particularly the focus on human connectedness to nature and perceptions of natural resources, aligns significantly with past studies concerning psychological well-being. Studies by Bratman et al. (2019), Hartig et al. (2014), and Brinkman et al. (2021) underscore the intricate link between human connectedness to nature and psychological well-being. The research consistently indicates that exposure to natural environments has a profound impact on reducing stress and anxiety, contributing to an overall improvement in mental health. The thematic review contributes to the ongoing discourse on psychological well-being by exploring literature that highlights the positive effects of nature on mental health and well-being. The thematic exploration, particularly regarding human connectedness to nature, enriches the understanding of how natural environments can be leveraged to positively influence the mental well-being of communities. The study reinforces the idea that recognizing and incorporating this connection is pivotal for the development of ecosystem-based management strategies that aim to enhance psychological health. Moreover, the study’s review recommendation includes the incorporation of natural elements into urban

planning and conservation initiatives that resonate with the practical insights derived from past studies. Policymakers, by integrating natural elements into the built environment and conservation efforts, have the potential to create environments that promote psychological health and resilience. Overall, this study underscores the practical implications of fostering ecological sustainability and the mental well-being of communities.

The implications drawn from the thematic review process, especially concerning perceptions of natural resources and well-being, align significantly with past studies concerning cultural significance. Researchers such as Berkes et al. (2000) and Armatas et al. (2018) have emphasized the considerable variation in the cultural significance of nature across different communities. Understanding the diverse ways in which various cultures value and connect with their natural surroundings is deemed essential for the successful implementation of ecosystem-based management approaches. The findings contribute to the ongoing discourse on cultural significance by exploring literature that delves into the connections between cultural values, perceptions of nature, and conservation practices. Regarding perceptions of natural resources and ecosystem-based management, this study enriches the understanding of how cultural significance shapes the relationship between communities and their ecosystems. The idea of integrating cultural perspectives into conservation initiatives is crucial for ensuring that strategies respect local values and traditions. By acknowledging and incorporating the cultural significance of nature, conservation strategies stand a better chance of being respectful, inclusive, and sustainable. Thus, the importance of recognizing the rich tapestry of cultural values and traditions that shape human-nature relationships, emphasizes the need for strategies to promote a more harmonious coexistence between communities and their ecosystems.

In response to community resilience and adaptation, this study revealed that the degree of human connectedness to nature significantly influences the resilience and adaptability of communities' environmental changes. Thıs is in line with the opinıons of Pyle (2003) and Chapin et al. (2010). This affirms that a strong bond with the natural environment often fosters a sense of stewardship, motivating communities to actively participate in conservation efforts and adapt to ecological transformations.

This study revealed the idea that fostering a strong bond between communities and their ecosystems is instrumental to the success of ecosystem-based management strategies. Moreover, the thematic review's recognition of the role of intrinsic connection in community-level resilience aligns with the practical insights derived from past studies. Communities engaged in stewardship and possessing a strong connection to their natural surroundings are better equipped to withstand and respond to the challenges posed by a changing environment. This study underscores the importance of acknowledging and promoting this intrinsic connection in conservation initiatives, emphasizing its role in building community resilience and fostering adaptability.

The implications drawn from the thematic review process, particularly the exploration of human connectedness to nature and perceptions of natural resources, align significantly with past studies concerning the acceptance of conservation measures. Researchers such as Dayer et al. (2018) and Tam et al. (2019) have highlighted the crucial role of human connectedness to nature in shaping the acceptance of conservation measures within communities. Understanding how individuals and communities perceive and value their environment is deemed vital for tailoring conservation initiatives that align with these values, fostering greater acceptance and cooperation in ecosystem-based management. This thematic study contributes to the ongoing discourse on the acceptance of conservation measures by exploring literature that delves into the connections between human connectedness to nature and the willingness of communities to embrace conservation efforts.

This study reinforces the idea that acknowledging and respecting the diverse perspectives within a community is vital for the success of conservation initiatives. The thematic review's recommendation to design conservation efforts to be more culturally sensitive and effective aligns with the practical insights derived from Zylstra, et. al., (2014) and Bennett, (2016). By tailoring conservation measures to align with the values and perceptions of communities, efforts are more likely to be accepted and embraced. The review underscores the importance of recognizing and respecting the diversity of perspectives within a community,

emphasizing that culturally sensitive approaches are key to fostering greater acceptance and cooperation in ecosystem-based management.

This study's drawn from the thematic review process, particularly the emphasis on human connectedness to nature and perceptions of natural resources; align significantly with past studies concerning environmental decision-making. Researchers such as Clayton et al. (2017) and Schultz (2002) have highlighted that human connectedness to nature have a significant influence over individual and collective decision-making concerning the environment. Recognizing this dynamic is deemed crucial for designing effective policies and interventions that resonate with the values and priorities of communities.

The thematic exploration, particularly regarding perceptions of natural resources and human connectedness to nature, enriches the understanding of how intrinsic connections with the natural environment shape environmental decision-making. The review reinforces the idea that leveraging this connection can enhance the success of ecosystem-based management by ensuring the active participation of those directly impacted. Moreover, the thematic review's recommendation to adopt inclusive decision-making processes aligns with the practical insights derived from past studies. Inclusive decision-making that considers the psychological and cultural dimensions of human-nature relationships can lead to more sustainable and widely accepted environmental policies. The review presents the importance of recognizing and respecting the influence of human connectedness to nature in decision-making processes, emphasizing that policies designed with this understanding are more likely to be effective and embraced by communities.

4.3.1 Objective 3a: The significance of Nature-based Solutions (NBS)

This thematic review's emphasis on biodiversity conservation, particularly through Nature-based Solutions (NBS), aligns with past studies that underscore the critical role of preserving and restoring natural ecosystems. Nature-based Solutions involve sustainable and resilient approaches that leverage the inherent benefits provided by ecosystems. The significance of NBS in biodiversity conservation is underscored by various studies, including those acknowledged by the Convention on Biological Diversity (CBD) in 2019. This is in line with past studies that have consistently highlighted the importance of biodiversity conservation for maintaining ecological balance and resilience. Biodiversity, the variety of life on earth, plays a fundamental role in supporting ecosystem functions and services. The interdependence of species within ecosystems contributes to their stability and adaptability in the face of environmental changes.

Preserving and restoring natural ecosystems through nature-based solutions is a strategic and effective approach to safeguarding biodiversity. This study's finding aligns with broader environmental management principles that emphasize working with natural processes and ecosystems rather than relying solely on engineered solutions. This approach is reflected in studies that advocate for sustainable land management, habitat restoration, and conservation practices. By recognizing and integrating the intrinsic value of natural ecosystems, nature-based solutions contribute to the overall health and sustainability of ecosystems. Nature-based solutions offer a holistic and ecological strategy for the conservation of biodiversity and ensure the functionality of entire ecosystems.

Nature-based Solutions emerge as pivotal instruments in climate change mitigation and adaptation efforts, a sentiment underscored by studies such as Seddon et al. (2020). These solutions offer sustainable approaches rooted in nature, playing crucial roles in sequestering carbon, reducing greenhouse gas emissions, and enhancing the resilience of ecosystems. The integration of nature-based solutions into climate change strategies provides a holistic and nature-centered response to the challenges posed by a warming planet. By aligning with these solutions, communities can actively contribute to global climate action while simultaneously benefiting from the resilience and sustainability inherent in natural processes. The relationship between nature-based solutions and ecosystem services is integral to human well-being, aligning with the findings of Daily et al. (2009). Nature-based solutions offer a diverse array of ecosystem services, including air and water purification, natural flood control, and the maintenance of

overall environmental health. These services are essential for the health and prosperity of communities, emphasizing the significance of nature-based solutions in supporting the resources necessary for human well-being. By recognizing and leveraging these services, communities can foster a symbiotic relationship with nature, ensuring the continued provision of essential ecosystem services.

Nature-based solutions champion sustainable resource management practices by prioritizing natural processes over artificial interventions, as emphasized in studies like Turner et al. (2016). This approach reduces reliance on environmentally harmful practices, fostering long-term environmental sustainability. By aligning with the inherent resilience of natural processes, Nature-based Solutions provide a framework for managing resources that minimize environmental impact. This sustainable approach ensures the continued availability of resources while safeguarding the health and functionality of ecosystems for future generations. The role of Nature-based Solutions in enhancing resilience to natural disasters is evident in studies such as Narayan et al. (2019). These solutions contribute to disaster risk reduction by restoring and utilizing natural buffers, such as wetlands and coastal ecosystems.

By incorporating Nature-based solutions into disaster risk reduction strategies, communities can build adaptive capacity and increase their ability to cope with and recover from natural disasters sustainably. The restoration and preservation of natural ecosystems serve as a cost-effective and environmentally sound strategy for minimizing the impacts of events like floods, storms, and wildfires, providing communities with a nature-centric approach to disaster resilience. About past studies, these findings align with a growing body of research emphasizing the effectiveness of Nature-based Solutions in addressing environmental challenges. Seddon et al. (2020), Daily et al. (2009), Turner et al. (2016), and Narayan et al. (2019) collectively reinforce the importance of integrating nature into climate strategies, recognizing the value of ecosystem services, promoting sustainable resource management, and enhancing resilience to natural disasters through Nature-based Solutions. As communities face escalating climate threats, these studies collectively advocate for the incorporation of Nature-based Solutions into mainstream environmental planning, fostering a harmonious coexistence with nature while addressing pressing global challenges.

4.3.2 Objective 3b: Perception of Human Natural Environment and Well-being

Communities worldwide possess unique cultural values and practices deeply intertwined with their natural environment. Past studies, notably the work of Gadgil et al. (2003), emphasize the critical role of recognizing and understanding these cultural dynamics for the development of effective conservation and management strategies. Cultural values often shape the ways communities interact with and perceive their environment. Integrating these cultural perspectives into conservation planning ensures strategies are not only respectful of local knowledge but also more effective in fostering community engagement. By building on the cultural wealth of communities, conservation initiatives can align more closely with the values and practices that are essential for the long-term success of environmental endeavors. The economic reliance on natural resources for livelihoods adds another layer of complexity to human-nature interactions. The delicate balance between conservation goals and economic needs is crucial for crafting sustainable management approaches. Studies by Steenberg, et. al., (2019); and Larson, et. al., (2016), has delved into economic perspectives on natural resources, particularly in urban settings. Parks and green spaces, often perceived solely as environmental amenities, play a dual role by providing livelihoods and economic opportunities. Recognizing and understanding this interplay is essential for sustainable urban development, aligning conservation efforts with economic realities to create strategies that benefit both the environment and local economies.

The distribution of natural resources and access to green spaces significantly impact the well-being of urban communities, with environmental justice being a critical consideration. Heynen et al. (2006) and Wolch et al. (2014) highlight the disparities in environmental risks and unequal access to green spaces experienced by marginalized communities. Addressing these disparities is vital for fostering equitable and sustainable urban environments. Past studies emphasize the importance of recognizing and rectifying these injustices in the perception and

distribution of natural resources, ensuring that environmental benefits are accessible to all members of the community. The link between the natural environment and the health and well-being of communities is a central theme in environmental research. Past studies, including those by Agboola et al. (2023), Bratman et al. (2019), and van den Berg et al. (2010), consistently demonstrate the positive impact of access to green spaces on mental health and overall well-being. Integrating health considerations into environmental planning becomes crucial for promoting holistic and sustainable urban development. Understanding how individuals perceive and interact with nature concerning their health is essential for designing interventions that not only enhance the environment but also contribute to improved community well-being.

Amidst the backdrop of rapid urbanization, understanding how communities perceive and utilize their land is pivotal for informed urban planning and conservation strategies. McDonald et al. (2019) emphasize the need for strategic development that accommodates the needs of growing populations while preserving natural spaces. This understanding informs the creation of strategies promoting sustainable and resilient urban development. By aligning conservation efforts with urbanization trends, strategies can be developed that not only preserve natural areas but also contribute to the overall quality of life in urban settings. The success of environmental initiatives is intrinsically linked to community engagement, a factor deeply influenced by how communities perceive their natural environment. Studies by Dallimer et al. (2012) and Kuo (2015) highlight the role of natural resources, particularly communal green spaces, in fostering social cohesion and community identity. Shared green spaces not only contribute to a sense of community but also encourage social interactions, strengthening the social fabric of urban neighborhoods. Recognizing and leveraging these social dynamics enhances the effectiveness of conservation and management strategies, emphasizing the need to actively involve communities in shaping their environmental future.

Community perceptions of natural resources intersect significantly with climate considerations, especially as urban communities recognize the role of green infrastructure in climate resilience and mitigation. McDonald, et. al., (2021); discusses the importance of trees, parks, and urban greenery in providing cooling effects and contributing to carbon sequestration. Residents' perceptions of a sustainable and resilient urban environment are influenced by the presence of these green elements. Integrating climate considerations into community perceptions ensures that sustainable practices align with local values and contribute to broader climate action goals. Recognizing the role of natural resources in climate resilience and mitigation becomes integral to creating strategies that resonate with communities and promote a more sustainable urban future. Summarily, the interplay between human communities and their natural environment is a complex tapestry woven with cultural, economic, social, and ecological threads. Drawing on past studies, this thematic review highlights the multifaceted nature of human-nature relationships, emphasizing the need for holistic and integrated approaches to conservation and urban planning. The recommendations derived from these insights provide a roadmap for creating strategies that not only preserve natural resources but also contribute to the well-being, resilience, and sustainability of communities in an ever-changing urban landscape.

5.0 CONCLUSION, AND RECOMMENDATIONS

This paper explores the intricate interplay among global transformations, emphasizing nature-based solutions. Despite the growing importance of this knowledge, existing research lacks a systematic summary of the interconnections among nature, ecosystem services, and human well-being. The symbiotic relationships between ecosystem-based management, subjective well-being, and connectedness to nature. The successful integration of EBM practices can create environments that not only sustain biodiversity and ecosystem services but also enhance individuals' psychological well-being and connectedness to nature. Recognizing these interconnections is imperative for holistic environmental planning and underscores the need for collaborative efforts across disciplines to promote sustainable and harmonious relationships between humans and the natural world.

Ecosystem-based management emerges as a paradigm with far-reaching implications, transcending mere environmental concerns. Its influence extends to psychological well-being, cultural significance, community resilience and adaptation, acceptance of conservation measures, and environmental decision-making. The positive impact on psychological well-being, as evidenced by past studies, underscores the potential of nature-centric approaches in fostering mental health. The acknowledgment of cultural significance and its integration into conservation initiatives resonates with the understanding that communities' cultural values wield significant influence over their relationship with nature. The recognition of environmental decision-making as a process intricately tied to human connectedness to nature emphasizes the importance of aligning policies with the values and priorities of communities.

Perception of the human-natural environment and its impact on well-being further amplifies the complexity of human-nature relationships. Cultural values and practices, economic dependence, environmental justice, and access all play pivotal roles in shaping communities' interaction with their surroundings. The economic dependence on natural resources introduces a layer of complexity, underlining the need for sustainable management practices that balance conservation objectives with economic needs. The disparity in environmental justice and access emphasizes the crucial aspect of equity in environmental resource distribution. Health and well-being emerge as paramount concerns, as evidenced by the positive effects of green spaces on mental health. The intricate relationship between land use and urbanization necessitates informed planning to accommodate growing populations without compromising natural spaces. Community engagement and participation exemplified by shared green spaces, foster social cohesion and contribute to the social fabric of urban neighborhoods. Finally, climate resilience and mitigation underscore the intersectionality of community perceptions with climate considerations, highlighting the role of nature-based solutions in sustainable urban development.

In light of these key findings, several overarching themes and implications resonate throughout the thematic review. The imperative recognition of the deep-rooted connection between humans and nature is not merely an ecological consideration but a foundational element influencing psychological well-being, cultural values, community resilience, and even economic practices. The interdependence of these facets underscores the need for holistic and integrated approaches in environmental planning and conservation strategies. The incorporation of Nature-based Solutions, informed by the concepts and implications elucidated, emerges as a promising avenue for addressing multifaceted challenges.

Moreover, the review sheds light on the importance of tailoring interventions to the specific cultural, economic, and social contexts of communities. The diversity of human-nature relationships, as reflected in cultural values, economic practices, and access to resources, necessitates a nuanced understanding of effective and equitable environmental management. Culturally sensitive approaches, community engagement, and inclusive decision-making processes are pivotal for the success of conservation initiatives, ensuring that strategies align with local values and foster a sense of ownership within communities. The thematic review not only consolidates existing knowledge but also provides a roadmap for future research and practical applications. The identified gaps and implications underscore the need for interdisciplinary collaborations, recognizing the intricate intersections between psychology, sociology, ecology, and urban planning. Integrating psychological and cultural dimensions into environmental policies, promoting community engagement, and leveraging Nature-based Solutions represent promising avenues for fostering sustainable human-nature relationships. In conclusion, the thematic review transcends conventional boundaries, weaving together strands of research to form a holistic understanding of human-nature relationships. As societies navigate the complexities of environmental challenges, the insights gleaned from this review serve as beacons, guiding the way toward sustainable, resilient, and harmonious coexistence with the natural world. The journey continues, with the hope that these revelations will inspire a collective commitment to nurturing the delicate balance between humanity and the environment for generations to come.

The study recommends advocating for policies promoting ecosystem-based management practices considering cultural significance and community resilience. The overview

of this study serves as a foundational resource for future research and offers valuable insights for policymakers addressing challenges related to the intricate relationships among nature, ecosystem services, and human well-being.

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