

Echoes of Myth: Reviewing Human-Nature Connectedness through Ancient Narratives

Killian L. Doyle

Department of Psychology, University of Twente

Faculty of Behavioural, Management, and Social Sciences

Supervisors: Dr. A. Sools, Y. Namer

22nd of January 2025

Abstract

This study reviews literature investigating the complex relationships between cultural narratives and Human-Nature Connectedness (HNC), with a particular focus on how mythology and folklore shape these dynamics. HNC is a multidimensional concept that describes ways in which individuals and communities are connected with the natural world on psychological, spiritual, and ecological dimensions. The present study follows an integrative approach to explore how these connections are informed by mythologies and folklore from diverse cultures. It identifies significant themes namely, “Spiritual and Sacred Relationships with Nature”, “Ethical and Reciprocal Relationships with Nature”, “Interconnectedness of Humans and Nature”, “Consequences of Environmental Exploitation”, and “Cultural Transmission of Environmental Knowledge” and synthesizes them into a theoretical framework. The framework presented in this study depicts the cyclical relationships between these themes that reoccur in mythology and folklore. The model further looks toward traditional narratives to foster deep and action-oriented knowledge of HNC, hence strengthen sustainability and ecological coexistence. This paper provides reasons to believe that the integration of such stories into educational curricula, conservation strategies, and policies can cultivate coexistence that is more respectful and integrated among humans and nature.

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A Long time ago, in the ancient lands of Ireland, lived Tuan mac Cairill, the sole survivor of the island. As the years passed, Tuan grew old and lonely in the vast wilderness. One fateful night, he fell into a deep, enchanted sleep and woke up to be transformed into a majestic stag. For many years, he roamed the forests, learning the secrets of the woods and the language of the trees. As time went on, Tuan once again felt the call of transformation. This time, he became a mighty boar, digging through the underbush and uncovering the ancient wisdom of the earth. Seasons changed, and Tuan transformed yet again, soaring high above the land as a proud eagle, witnessing the expanse of Ireland from the sky. In his final transformation, Tuan became a graceful salmon, swimming through the clear rivers and streams. His journey as a salmon brought him to a queen who caught and consumed him, leading to his rebirth as a human once more. With memories of all his past lives, Tuan carried the profound wisdom of nature and the history of Ireland within him, a living testament to the eternal connection between humans and the natural world.

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The old tale of Tuan mac Cairill from Ireland illustrates the deep connection between humans and nature. Tuan shape-shifts into several animals during his journey. In that way, he learns that all beings, including humans, are intertwined in one big web. This reflects longtime cultural narratives of the intrinsic bond between nature and human beings, also referred to as Human-Nature Connectedness (HNC). HNC is a complex and multifaceted concept central to understanding how individuals relate to and identify with nature (Restall & Conrad, 2015). It has been demonstrated to positively affect emotional, psychological, and behavioural aspects of human life (Restall & Conrad, 2015). For instance, it was shown that people with higher levels of nature connectedness are typically more open, conscientious, extraverted and agreeable

(Capaldi et al., 2014). Moreover, HNC plays a significant role in promoting sustainability and fostering well-being (Capaldi et al., 2014; Barragan-Jason et al., 2021). Despite its importance, the conceptualization of HNC in the existing literature often remains vague, primarily focusing on abstract definitions rather than actionable insights. Scholars like Leopold and Schwartz (1950) as well as Kellert and Wilson (1993) have emphasized HNC's necessity for sustainable human behaviour, yet the frameworks they propose offer limited guidance on how this connection can be cultivated or applied in real-world contexts. Terms like "nature connectedness", "ecological identity" and "nature relationship" are often used to relate to HNC, adding to further theoretical ambiguity (Restall & Conrad, 2015). Moreover, cultural and symbolic dimensions are often excluded from the discussions of HNC, thus undermining the role of narratives in shaping human perceptions and behaviours.

Through the lens of cultural narratives deep insights into HNC can be gained. The relationship between humanity and the environment has been framed throughout history by cultural narratives in the form of mythology and folklore. Folklore encompasses a variety of traditional expressive forms, including oral traditions like stories, songs, prayers, and oral histories, as well as rituals, beliefs, material culture, and traditional practices (Gazin-Schwartz, 2012). The term was introduced by William Thoms to replace "popular antiquities" but since has been difficult to define clearly, with the American Folklore Society stating that folklore is best explained through examples rather than definitions. Myths, often regarded as a specific type of folklore, focus on sacred stories about the origins of cultures (Gazin-Schwartz, 2012). They often reflect ecological wisdom and provide moral and ethical guidelines for sustainable living (Eidinow, 2016).

This review aims to examine articles that have investigated the concept of HNC within a specific folklore or mythology. An integrative literature review is used to identify the descriptive characteristics of these articles as well as their outcome. In this manner, the review follows two main goals. It makes the attempt to create a creative framework of HNC by synthesizing existing research within the unique context of mythology and folklore. In doing so, this study further aims to contribute to a more detailed and practical articulation of HNC and show how it can be applied to real-world settings.

Human-Nature Connectedness Theory and Research

One of the first attempts to define HNC comes from Aldo Leopold, who states that humans mistreat the land because it is thought of as a mere resource (Heffernan, 1982). He further argues that one can only treat it with respect and affection if the land is regarded as a community in which humans are part of. Leopold's so called Land Ethic theory highlights the importance of changing our fundamental attitudes towards nature, requiring a paradigm shift in how humans relate to nature. A central idea of the theory is that the well-being of humanity is deeply tied to the health of ecosystems (Heffernan, 1982). However, the term Human-Nature Connectedness can be defined in several ways (Barragan-Jason et al., 2021). In this review, the definition of Restall and Conrad (2015) will be used. They broadly define human's connectedness to nature as how an individual relates to and identifies with nature. Due to its adaptability, the use of this broad definition of HNC enables a comprehensive exploration of this concept. Given the diversity of terms and expressions in scientific literature that relate to HNC, this term will be used to encompass all concepts aligned, for example "Nature Connectedness", "Nature Relationship", and "Human-Nature Connection" (Restall & Conrad, 2015).

So far, several attempts have been made to explain the underlying functions of HNC. A common conception is that humans are predisposed to focus on and identify with other life forms (Capaldi et al., 2014). The “biophilia hypothesis” by Kellert and Wilson (1993) further underscores this evolutionary perspective on HNC. They argue that to our ancestors, it would have been evolutionary adaptive to be linked to nature. According to this theory, the connection between humans and nature is necessary for survival and those with stronger ties to nature would have considerable evolutionary advantages over those with weaker ties (Capaldi et al., 2014). While existing models, such as Leopold’s Land Ethic (1949) or the Biophilia Hypothesis (Kellert & Wilson, 1993), have significantly advanced the understanding of HNC they often remain abstract and generalized (De Block, 2011; Eba, 2020). Moreover, they lack the practical applicability necessary for informing real-world environmental education and conservation efforts.

Capaldi et al. (2014) conducted a meta-analysis to investigate the relationship of nature connectedness and happiness. They explored studies that utilized explicit self-report measures of nature connectedness and subjective well-being. In general, they observed that HNC has considerably positive impacts on individuals, by fostering a sense of belonging and identity with the ecological system. Their findings indicate that nature connectedness positively influence subjective happiness. This is in line with the findings of Barragan-Jason et al. (2021) that suggests that HNC is positively correlated with emotional and psychological well-being. In 2020, Nisbet et al. conducted a community-based study that explored how connectedness with trees and wildlife increases general well-being. Their findings indicate that connectedness to nature not only promotes individual well-being but can also increase social bonds within the community. This is further supported by research of Cartwright et al. (2018) that found that a

high exposure to nature can diminish the negative impact that a lack of social connectedness has on well-being. Even though studies find that a connectedness to nature is positively related to well-being and happiness, some people tend to develop stronger ties with nature because of their personalities (Di Fabio & Kenny, 2018). Personality traits such as conscientiousness, extraversion, agreeableness, and openness have also been linked to HNC. In research several studies were conducted to investigate the positive impact of HNC on the individual. For example, individuals with greater levels of nature connectedness are also more likely to engage in a range of pro-environmental activities and spend more time outside (Capaldi et al., 2014). Nevertheless, Adams (2016) argues that addressing the social structures is equally important to achieve ecological health. However, there is still only a limited understanding of how HNC can foster ecological health. In conclusion, high bidirectional associations were discovered in the relationship between HNC and well-being, highlighting the need for studies on HNC, since it can enhance individual and ecological health.

However, in comparison with early environments, nowadays there is a sharp and growing contrast in our exposure to nature. According to the United Nations Population Division, more humans currently live in urban areas opposed to rural areas (Capaldi et al., 2014). The rapid urbanization experienced in the last decades, has led to an increased disconnection from nature (Colding, 2020). Moreover, the Covid-19 pandemic led to massive restrictions of private and social lives. While studies on HNC and the Covid-19 pandemic are still limited, Haasova et al. (2020) showed that the concept of HNC significantly influences how people psychologically respond to the pandemic. Furthermore, Fornara et al. (2023) investigated the relationship between contact with nature and anxiety. They argue that staying in contact with nature could be highly beneficial to counter the negative impact of the pandemic on the individual's mental

health. It is worthy to note, too, that the sense of disconnection from nature primarily happened in the west and industrialized countries (Vining et al., 2008). Vinning et al. (2008) affirm that feelings of domination over nature result from several historical and philosophical developments. One key influence is the philosophy of dualism, advanced by Descartes (1637) which posits the idea that human minds and bodies are separate. According to Vining et al., (2008) and other theorists, this idea was further exploited leading to the notion that humans were separate from and dominant over nature. Successive historical developments in science and technology have entrenched this view through the reliance on empirical methodologies. Paradoxically, it is this supposed alienation from nature that has brought human beings to consider nature as sacred and in need of protection. For example, the urge to engage in activities like gardening or pet-keeping has been viewed as an unconscious attempt to get back in touch with nature (Vining et al., 2008). Yet another school of thought maintains that people project their values and ideals onto nature and view it as a reflection of themselves. This makes the relationship of humans with nature subjective and culturally driven. This complexity provides evidence of the need for a critical review of how HNC is conceptualized in cross-cultural settings. In the end, growing disconnection with nature and the limited capacity of the existing models of HNC have raised the need for creative frameworks that offer holistic and practical understanding of HNC, further enabling their application in real-world environmental settings.

Insights from Mythologies

It is within such cultural narratives of myth and folklore that human perception concerning the relationship with nature has been shaped and defined over many centuries. They illustrate how various cultures interact with the natural world while representing certain values and principles laying the foundation for human-nature interactions. As most mythologies are

rooted in the relationship between human beings and nature, analysis of the stories themselves can give insight into the concept of HNC. In general, myths can act as a repository of ecological wisdom, which stands for respect towards nature, including the human-nature connection, as an interrelated entity (Eidinow, 2016; Ikonen et al., 2024). They often provide moral and ethical guidelines that emphasize key themes such as respect, stewardship, sustainability, and other universal principles that have influenced human behaviours for centuries (Ikonen et al., 2024).

The human-nature relationship is represented differently across cultures, often personifying nature through gods and spirits that represent natural elements and forces (Ikonen et al., 2024). These mythological tales bring out the interconnectedness of all life forms and have been used to point toward harmony between humans and nature. For example, Greek mythology contains the Earth goddess, a personification of the living planet that was thought to represent Earth as a breathing, living creation that should be treated with respect and care (Eidinow, 2016). Similarly, Native American mythology focuses on "Mother Earth," reflecting their respect for nature and reinforcing the pre-existing relationship between the culture and nature (Sepie, 2017). These types of stories can be deconstructed to better comprehend how various cultures conceptualize HNC. In turn, this can deepen the understanding of the principles guiding sustainable living and ecological balance. This highlights the profound capacity of myths and folklore to inform contemporary approaches to environmentalism. However, existing research has yet to fully explore how cultural narratives inform practical efforts to foster HNC. Understanding these narratives provides insights into the guiding principles of human-environment interactions across cultural traditions.

Integrating Mythologies and Human-Nature Connectedness

This study conducts an integrative literature review to explore how mythologies and folklore relate to HNC, drawing on insights from existing scholarly literature on these narratives. Based on symbolic, philosophical, and experiential dimensions of analysis, the review identifies recurring themes discussed in the selected literature. The integrative approach further allows a thorough synthesis of these insights, addressing a gap in most existing frameworks that neglect the role of mythology and folklore. Through a cross-cultural analysis, this study aims to develop a comprehensive framework covering ecological, ethical, and cultural dimensions. Building on insights from prior studies, this paper further advances the understanding and application of cultural narratives in shaping human-nature relationships. The present investigation attempts to answer the aforementioned aim by exploring the following research question:

How do qualitative narrative and literary analyses of mythologies and folklore explore and interpret human-nature connectedness within specific cultural or environmental contexts?

To achieve this, the study addresses three sub questions:

1. *What are the characteristics of the articles reviewed, including their methodological quality and study designs and how is HNC conceptualized?*
2. *What key themes and relationships between mythologies, folklore and HNC are identified in the reviewed articles?*
3. *How can the findings from the reviewed articles be synthesized into a new framework or model to better understand the role of mythology in fostering human-nature connectedness?*

Method

Study design

The method of an integrated literature was chosen for its ability to systematically gather, review, and synthesize the findings of existing research, to create new insights and theoretical frameworks (Whittemore & Knafl, 2005). Integrative reviews are especially fitting when addressing complex and multifaceted research questions, as they allow the inclusion of a wide range of studies, including qualitative and quantitative research, theoretical papers, and empirical studies (Torraco, 2005). The combination of findings extracted from different sources presents the opportunity to get a comprehensive impression about the topic and, at the same time, to emphasize recurring themes and identify literature gaps with regard to any further research directions. Moreover, the structure of this review is following the five-stage process for integrative reviews outlined by Russell (2005), which includes problem formulation, data collection, data evaluation, data analysis, and interpretation. The checklist for writing integrative literature reviews by Torraco (2005) was carefully followed to ensure the quality of the thesis (see Appendix C).

Information Sources and Search Strategy

Literature searches were done in both Scopus and Web of Science databases due to the extensive coverage of peer-reviewed journal articles in various research fields. An extensive search string was developed to encompass a wide range of synonyms and related terms that are used in the context of mythologies, folklore, and human-nature connectedness. The search string included terms like “myth*”, “folk*”, “legend*”, “tales” in combination with synonyms for HNC, such as “Human-Nature Relationship”, and “Ecological Connection”. The search string that was used for both databases is as follows:

((myth OR folk* OR legend* OR tales) AND ("Human-Nature Relationship" OR "Human-Nature Interaction" OR "Human-Nature Connection" OR "Human-Environment*

Relationship" OR "Human-Environment Interaction" OR "Human-Environment Connection" OR "Ecological Connection" OR "Ecological Relationship" OR "Ecological Interaction" OR "Nature Connection" OR "Nature Relationship" OR "Nature Interaction" OR "Human-Ecology Connection" OR "Human-Ecology Relationship" OR "Human-Ecology Interaction" OR "Environmental Connectedness" OR "Nature Interconnectedness" OR "Ecological Interconnectedness" OR "Human-Nature Bond" OR "Environmental Bond" OR "Nature Bond" OR "Nature Affiliation" OR "Ecological Affiliation" OR "Human-Nature Affinity" OR "Environmental Affinity" OR "Nature Engagement" OR "Ecological Engagement" OR "Nature Reciprocity" OR "Human-Earth Relationship" OR "Human-Earth Connection" OR Nature And Human))).

The comprehensiveness of the above-mentioned search string enabled to capture diverse terminologies used in literature to describe both mythology and HNC. Relevant synonyms were identified through preliminary review of key studies and databases to avoid overlooking significant research. Additionally, snowball sampling and citation tracking were used to capture any relevant studies that might not have been identified through the initial database search.

Eligibility Criteria

The eligibility criteria were created to ensure the selection of studies most relevant to the research question. They were specifically tailored to select studies that discuss the role of HNC in one specific mythology or folklore opposed to articles that are general overviews of cultural narratives. This tailoring allows a more detailed comparison of the different themes and conceptualizations of HNC that the articles analysed. The cross-cultural approach also enables the identification of universal themes revealing shared patterns and values in how different culture view their relationship with nature. Articles were included if they were peer-reviewed,

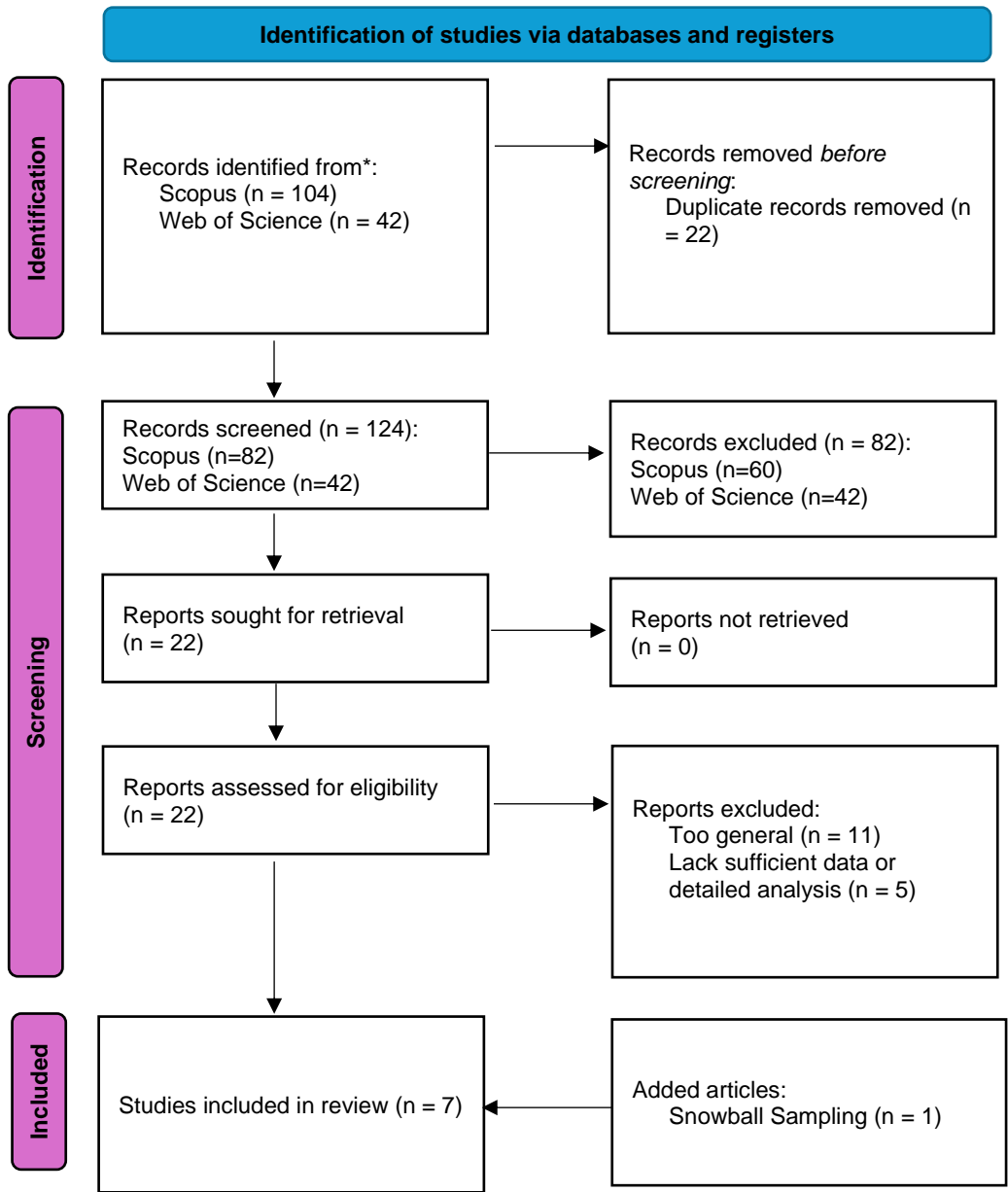
published within the last 20 years, and directly address the relationship between a specific mythology or folklore and HNC. Studies were excluded if they were non-peer-reviewed, provided only general discussions on mythology and folklore without focusing on specific examples, or lacked sufficient data or detailed analysis. However, the exclusion criteria were held limited, so that a variety of different perspectives and approaches can be reviewed. This selection process ensures that the review is based on high quality studies that provide in-depth insights into specific cultural narratives.

Study Selection

The selection process involved a two-stage screening procedure which followed the PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only (Page et al., 2021). Initially, the titles and abstracts of the identified articles were added to the software “Covidence” to exclude studies that did not meet the inclusion criteria. The limited number of identified articles reflects the niche focus of this review, as many articles were excluded due to their lack of specific investigation into the role of mythology or folklore in exploring HNC, or their failure to meet the inclusion criteria.

Figure 1

Overview of the Screening Process according to the PRISMA Guidelines



Data Evaluation

Assessing the quality and relevance of the studies is a crucial step in an integrative review. The data evaluation process took into consideration the reliability of the included studies by following principles set by Russel (2005), who showed the importance of a systematic

assessment of study quality. Consequently, the CASP Qualitative Studies Checklist was used throughout all the included studies in order to ensure consistency and thoroughness (see Appendix A). As advised on the CASP Website, no scores were used to classify the quality of the articles, as such scores might be misleading. However, if the evidence used cannot answer at least two of the first three questions with a “yes”, it is considered to be rather poor in quality (Brice, 2023). The CASP Checklist further allowed a detailed evaluation of their quality and relevance. For instance, Eidinow (2016) explored the relationship between myths and ecological wisdom but did not specifically investigate how myths foster HNC in particular contexts. Similarly, Farrelly (2022) examined mythopoetic participation and environmental consciousness in education, and pedagogical approaches rather than direct connections to the role of folklore in HNC. Ikonen et al. were excluded because their focus is on the use of mythical narratives in environmental education and not on the role of one specific myth and its relation to HNC. These studies are valuable in broader discussions but did not align well with the specific objective of the review. Next, the CASP checklist helped to systematically assess key aspects of each study, for example the appropriateness of the data collection methods and reflexivity of the researchers. Through the use of the CASP checklist, a solid foundation is provided for the next step of analysing and synthesizing the information and developing a new theoretical framework.

Data Analysis

The conceptual model for thematic analysis by Braun & Clark (2006) is used to extract the relevant data of the reviewed articles. Using this method allowed to identify reoccurring themes, patterns, and cultural perspectives that are related to mythologies and HNC. To answer the second sub question, the thematic analysis process followed the six-step coding approach which was outlined by Naeem et al. (2023). Although the coding process followed mostly an

inductive approach, it was also influenced by ideas and prior knowledge from different frameworks, such as Restall and Conrads (2015) definition of HNC. This subtly shaped the interpretation and categorization of data, resulting in a more hybrid approach of coding. The coding focused on sections of the articles that are related to HNC, most often being the results, discussions and occasionally the abstract and introduction sections. The steps include familiarization of data, identification and the selection of keywords as well as transforming these codes into broader themes, highlighting patterns and relationships related to HNC (Naeem et al., 2023). The codes were applied and organized using the software, Atlas.ti. In the initial coding step, specific phrases, concepts, or practices discussed in the selected literature were labelled with codes. Codes with overlapping or similar meanings were then further grouped into broader subcodes. The subcodes were reviewed and refined to ensure accurate representation of data. For each article a table was created which helped the different subcodes and initial codes to maintain consistency and clarity. With the function “Wordcloud”, wordlists were created for each article to identify prominent words, which provided first general overviews and help to develop initial codes. Main challenges that were encountered during coding were vague or abstract language that some sections of the articles contained, making it difficult to assign them to specific codes or themes. For example, phrases like “deep respect for nature” might be interpreted differently depending on culture or context. Furthermore, during the thematic analysis, some initial codes or data segments appeared relevant for several subcodes, and maintaining an overview of the codes was sometimes difficult. To address this, the definitions of each subcode were revisited and ensured that they were distinct and mutually exclusive. The first step of creating key themes involved merging overlapping sub-codes into core dimensions that similar subcodes share. The

final themes and subcodes were then clearly defined with definitions that reflect their scope and relevance to HNC.

To better explain these themes a synthesized theoretical model has been developed, incorporating the main insights from these themes into one broad framework that underlines the interdependent, cyclic and self-reinforcing nature and hence provides new insights into the role of mythology and folklore in fostering HNC. After the themes were finalized, their relationships were studied in order to find the patterns and connections across the reviewed articles. Interactions of the themes were mapped, showing their bidirectional dynamics. The model's visual representation was done with the Software "Draw.io" which is a free open-source tool for the creation of graphs and figures. The final framework was then synthesized by integrating these interconnected themes into a coherent structure. The synthesis involved grouping related themes, structuring interrelationships and grounding in data. Here, the framework was consistently cross-referenced with specific findings from the reviewed articles. To demonstrate the practical applicability of the model, a hypothetical framework was created to apply the insights to a real-world context. Therefore, a fictional narrative scenario was constructed.

Results

Data Evaluation

The basis of this review consists of seven articles that met the eligibility criteria and were included in the final analysis. The quality assessment of the selected articles that was conducted using the CASP Qualitative Studies Checklist, showed a high level of methodological quality across all selected studies. Due to the easy to use and self-explanatory structure of the checklist, no difficulties making this assessment were encountered (see Table 1). Overall, while all seven articles had clearly articulated their research aims and employed respective qualitative

methodologies in the investigations towards the complex relationships between cultural narrations and HNC, data collection and analysis were generally fairly robust. The detailed examinations have been performed for the discussed cultural themes and implications embedded in various mythologies and folklores. Although the study of Echarri-Iribarren (2020), had more context-specific applicability towards education in schools, all articles contributed valuable insights to the broader discourse on how folklore and mythologies relate to HNC. While some aspects, such as ethical considerations and researcher-participant relationships, were identified as 'Can't Tell' because of a lack of detail in the reporting, this limitation does not detract from the overall methodological quality of these studies, which met most of the critical appraisal criteria. Based on the criteria that are proposed by the CASP Checklist, all selected studies are of high quality and provide a strong foundation for synthesizing findings in the integrative review. An Example CASP Qualitative Studies Checklist for the article of Arianto et al. (2024), is attached in Appendix A.

Table 1

Scores of the Articles on CASP Checklist

Questions	Rajiv & Piraji, 2023	Echarri-Iribarren, 2020	Yoon, 2021	Arianto et al., 2024	Hembrom, 2022	Martemjen, 2024	Hilmi et al., 2024
1. Was there a clear statement of the aims of the research?	Y	Y	Y	Y	Y	Y	Y
2. Is a qualitative methodology appropriate?	Y	Y	Y	Y	Y	Y	Y
3. Was the research design appropriate to address the aims of the research?	Y	Y	Y	Y	Y	Y	Y

4. Was the recruitment strategy appropriate to the aims of the research?	CT	CT	CT	Y	Y	CT	CT
5. Was the data collected in a way that addressed the research issue?	Y	Y	Y	Y	Y	Y	Y
6. Has the relationship between researcher and participants been adequately considered?	CT	CT	CT	CT	CT	CT	CT
7. Have ethical issues been taken into consideration?	CT	CT	CT	Y	CT	CT	CT
8. Was the data analysis sufficiently rigorous?	Y	Y	Y	Y	Y	Y	Y
9. Is there a clear statement of findings?	Y	Y	Y	Y	Y	Y	Y
Score out of 9	6	6	6	8	7	6	6

Note. Y = Yes, CT = Can't Tell.

Sub question 1: Characteristics of Reviewed Studies and Conceptualization of HNC

The selected studies are all qualitative in nature and use diverse methodologies such as narrative analysis, ethnography, literary analysis, and case studies to investigate the relationship between mythology, folklore and HNC (see Table 2). Methodological strength is evident through the studies research questions and context-specific theoretical frameworks. For instance, narrative analysis and ethnography are prevalent in investigations of Malay sacred myths, Santal folktales, and Naga folklore, in which researchers use cultural contexts to extract symbolic and ecological meanings (Arianto et al., 2024; Hembrom, 2022; Martemjen, 2024). Literary analysis and ecocriticism are employed in the exploration of contemporary Indian retellings of the “Mahabharata”, where traditional myths are reinterpreted to align with modern ecological concerns (Rajiv & Piraji, 2023). Additionally, case study approaches are also utilized to examine Basque mythology, especially its integration into environmental education to foster ecological

spiritual intelligence (Echarri-Iribarren, 2020). The analyses of Korean folk narratives by applying cultural studies and geomantic theory reveal the underlying values that conceptualize landscapes as living entities influencing human actions and beliefs (Yoon, 2021). In sum, the applied methodological approaches ensure cultural authenticity and interpretative depth.

Overall, the studies present HNC as a multidimensional construct based on cultural narratives, symbolic meanings, and ecological values. Each of these studies offers insights into how mythology and folklore reflect and influence human relationships with nature. Malay sacred myths emphasize an ethnoecological connection, portraying myths as tools for ecological stewardship (Arianto et al., 2024). Furthermore, Santal folktales highlight the community's identity as "children of nature," deeply connected to their environment (Hembrom, 2022). Investigating Naga folklore, it is observed that they embed principles of biodiversity conservation, viewing HNC as integral to cultural ethics (Martemjen, 2024). Moreover, Basque mythology integrates spirituality with environmental education, making it possible to use these myths to promote ecological spiritual intelligence (Echarri-Iribarren, 2020). Similarly, Balinese myths emphasize spiritual harmony with nature as sacred (Hilmi et al., 2024). Indian retellings of the "Mahabharata" reinterpret ancient narratives to address contemporary ecological concerns, demonstrating the dynamic relationship between myths and eco-consciousness (Rajiv & Piraji, 2023). Additionally, Korean folk narratives connect geomantic values with HNC, conceptualizing landscapes as spiritual entities (Yoon, 2021). Taken together, these investigations establish HNC as more than a theoretical construct. They view HNC as lived experience which is deeply embedded in cultural practices and ecological relationships, varying across contexts, consistently emphasizing the interdependence of humans and nature.

Table 2*Study Characteristics*

Authors and Year	Title of Study	Cultural context	Methodology	Main research question(s)	Theoretical Framework
Arianto, T., Adrias, Septriani, & Yulika, F. (2024)	The Ethnoecology of the Malay Sacred Myth through Narratives of Kampung Tua Nongsa in Batam	Malay, Kampung Tua Nongsa in Batam	Narrative Analysis, Ethnography	How do Malay sacred myths influence the community's relationship with their natural environment?	
Rajiv, R., & Piraji, P. N. (2023)	Cultural Implications of Nature and Eco-Consciousness in Select 21st Century Indian	Indian, with a focus on contemporary interpretations of the Mahabharata	Literary Analysis, Ecocriticism	How do contemporary retellings of the Mahabharata reflect and influence ecological	Ecocriticism and literary analysis frameworks focusing on the reinterpretation of ancient texts in contemporary contexts

Retellings of the
Mahabharata

consciousness in
modern India?

Echarri- Iribarren, Echarri- Iribarren (2020)	Environmental Education and Ecological Spiritual Intelligence: The Case of Basque Mythology	Basque culture, focusing on the role of mythology in environmental education	Narrative Analysis, Case Study	How can Basque mythology be used to foster ecological spiritual intelligence in environmental education?	Educational theory and ecological spiritual intelligence frameworks
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Hembrom (2022)	A Study of Santals as Children of Nature in the Light of Santal Folktales	Santal community, India, focusing on their folktales and ecological identity	Narrative Analysis, Ethnography	How do Santal folktales reflect the community's deep connection with nature, portraying them as "children of nature"?	Indigenous ecological knowledge frameworks, cultural studies
Hilmi, H. S., Andayani, & Wardani (2024)	Human and nature relations in Hooykaas Christiaan's Enige Sasakse Volksvertelsels (Lombok): An ecocritical study	Balinese culture, as documented by Hooykaas	Narrative Analysis, Ethnography	How do Balinese cultural and spiritual beliefs, as documented by Hooykaas, shape human-nature relationships?	Cultural and spiritual studies frameworks, focusing on human-nature relations

Lanusashi, Martemjen (2024)	Biodiversity Conservation Ethos in Naga Folklore and Folksongs	Naga community, India, focusing on folklore and folksongs	Narrative Analysis, Ethnography	How do Naga folklore and folksongs embed principles of biodiversity conservation and reflect the community's ecological values?	Indigenous ecological knowledge frameworks, focusing on conservation ethics
Yoon (2021)	Ideas Relating to Humanity-Nature Relationships in Korean Folk Narratives Reflecting Geomantic Values	Korean culture, focusing on folk narratives and geomantic (feng shui) values	Narrative Analysis, Cultural Studies	How do Korean folk narratives reflect and reinforce geomantic values that shape human-nature relationships?	Geomantic theory, cultural studies frameworks

Sub-question 2: Key Themes Linking Mythology, Folklore, and HNC

The aforementioned seven articles were analysed, resulting in the identification of several themes namely, “Spiritual and Sacred Relationships with Nature”, “Ethical and Reciprocal Relationships with Nature”, “Interconnectedness of Humans and Nature”, “Consequences of Environmental Exploitation”, and “Cultural Transmission of Environmental Knowledge” (see Table 3). Each theme consists of four to six subcodes, that were derived from several initial codes. The coding process and its outcomes are documented through thematic maps, codebooks (Appendix B), and a summary table of themes.

The subcodes “Spiritual and Ethical Relationship with Nature”, “Spiritual and Sacred Relationship with Nature” and “Spiritual and Cultural Stewardship of Nature” share conceptual overlap of seeing nature as a sacred entity and emphasizing a deep connection to it. They explore how folklore and mythologies foster a sense of spiritual connection to the environment, often expressed through rituals, moral obligations, and cultural stewardship. They were therefore merged into the theme “Spiritual and Sacred Relationships with Nature” (see Table 3). For Example, the sentences

This concept signifies that human interaction with nature not only involves physical actions or exploitation of resources but also requires a comprehensive ethical foundation.

Nature is not just a passive object that can be utilised without moral consideration but rather an entity that requires attention and protection. (Hilmi et al., 2024, p.6)

It was coded with the subcodes “Spiritual and Ethical Relationship”, and “Spiritual and Sacred Relationship with Nature” as it adequately describes how the concept ethics of care is implemented in a Sasak folktale (Hilmi et al. 2024). The second theme “Ethical and Reciprocal Relationships with Nature” explores the mutual, ethical obligations between humans and nature

and emphasizes the need for biodiversity conservation, ecological responsibility and care. The subcode “Cultural Mechanisms for Biodiversity Conservation” is attributed to the second theme which can be exemplified through an excerpt of the article of Martemjen (2024):

In the Phom Naga saying that states ‘Phongpenn Phaünyü Loihamnyih Paikok Vü Kao Tülangtük’, meaning ‘Don’t cut the stem of this plant; it will feed you during famine’. Such strict adherence of belief and practices has led to deeper understanding of living Mother Nature, enabling people to protect and preserve the environment around them. (Martemjen, 2024, p.3)

The next theme “Interconnectedness of Humans and Nature” concerns the holistic perspective that humans are an integral part of the natural world. For instance, the quote “In the story, humanity can become an element of nature and serve nature as if they are natural elements, without transforming into natural elements themselves” (Yoon, 2021, p.9), illustrates how nature is not seen as separate from humanity but as an extension and reflection of it. The fourth theme that was synthesized was named “Consequences of Environmental Exploitation”. This theme focuses on the impact of neglecting sacred and ecological norms, which often involves symbolic depictions in folklore and myth of nature’s punishment for human exploitations. In the article Rajiv & Piraji (2023) the quote “Symbolism has been very tactfully employed to indicate the outcomes of destruction and damage caused to nature by humans” (Rajiv & Piraji, 2023, p.11), is coded with the subcode “Symbolism of Natures Wrath”. With this sentence the author shows how symbolism is used in mythology to highlight the negative consequences of human actions. The last theme is named “Cultural Transmission of Environmental Knowledge”. It reflects the role that folklore, myths and cultural narratives play in passing on ecological knowledge and ethics. They act as repositories of environmental wisdom, principles of sustainability, respect and

harmony with nature. The quote “For example, Basque mythology can be used to establish a point of union to advance towards an adequate relationship with nature, towards a naturalistic affect with people through their ecological spiritual intelligence” (Echarri-Iribarren, 2020, p.8), underlines how mythology can serve as tool to transmit environmental knowledge.

In conclusion, these five overarching themes—spiritual and sacred relationships, ethical reciprocity, interconnectedness, consequences of environmental exploitation, and cultural transmission—not only highlight the profound ways that mythology and folklore articulate the multifaceted dimensions of HNC, but also their ongoing significance in forming and maintaining human-nature relationships in a variety of cultural contexts.

Table 3*Key Themes with corresponding Subcodes and Example Quotes*

Themes	Subcodes	Example Quotes
Spiritual and Sacred Relationships with Nature	Spiritual and Ethical Relationship, Spiritual and Sacred Relationship with Nature	12:21 p 6 in Hilmi et al., 2024 “This concept signifies that human interaction with nature not only involves physical actions or exploitation of resources but also requires a comprehensive ethical foundation. Nature is not just a passive object that can be utilised without moral consideration but rather an entity that requires attention and protection.”
	Spiritual and Cultural Stewardship of Nature	8:41 p 14 in Arianto et al., 2024 “Excerpt (11) reflects the emphasis on maintaining cleanliness as a form of a broader commitment to environmental stewardship.”
	Personification of Earth, Personification and Feminization of Nature	12:8 p 5 in Hilmi et al., 2024 “Therefore, this concept encourages the adoption of an ethic of care for the environment, viewing nature not only as a resource that can be utilised but also as a living partner that needs to be safeguarded with a sense of responsibility and wisdom.”
		9:14 p 9 in Rajiv & Piraji, 2023 “Women and nature are culturally seen as possessing the same qualities and therefore, nature is feminized. In both novels, Madhavan sets a strong bondage

		of her protagonists with nature and endorses a deep association of her female characters with nature.”
Ethical and Reciprocal Relationships with Nature	Ethical and Reciprocal Relationship with Nature	13:15 p 3 in Martemjen, 2024 “Observance of taboos and genna were a guiding principle in the lives of the Nagas as far as their relationship with the natural environment is concerned.”
	Cultural Mechanisms for Biodiversity Conservation, Community-Led Environmental Action	11:15 p 7 in Hembrom, 2022 “The Santal stories do not shy away from personifying the animals” 13:14 p 3 in Martemjen, 2024 “In the Phom Naga saying that states ‘Phongpenn Phaünyü Loihamnyih Paikok Vü Kao Tülangtük’, meaning ‘Don’t cut the stem of this plant; it will feed you during famine’ 8. Such strict adherence of belief and practices has led to deeper understanding of living Mother Nature, enabling people to protect and preserve the environment around them.” 8:33 p 12 in Arianto et al., 2024 “According to the myth, a dragon launched from Nongsa Island to the sea, creating Putri Island. The sacred significance of Nongsa Island, its beach, and Putri Island is upheld by various prohibitions, indicating profound and sacred values linked to Batu Belah and these locations among the Malay community.”
	Human Impact on Nature and Ecological Responsibility	12:35 p 9 in Hilmi et al., 2024 “It involves active participation in the preservation and restoration of the environment with the understanding that every action has an impact that transcends the boundaries of a particular geographical area.”

	Nature as a Source of Livelihood and Survival	11:8 p 6 in Hembrom, 2022 “In their moments of need, nature stands by them like a mother, providing food for them. The Santals collect their food from the jungle. The characters are mostly involved in agricultural work. They know how to survive in a critical situation. In the tale ‘Lakhan and the Wild Buffaloes,’ for example, the hero, Lakhan, survives in the forest by drinking wild buffaloes’ milk. Again, in the tale, ‘Kara and Guja’, the two brothers, Kara and Guja, go to the forest to dig some roots to eat.”
Interconnectedness of Humans and Nature	Interconnectedness and Balance with Nature, Interconnectedness and Holistic Views, Ecological Balance with Nature	9:6 p 8 in Rajiv & Piraji, 2023 “In the novel, the fisherman tribe takes from nature what they need and not more without dehiscing their ecology” 12:23 p 6 in Hilmi et al., 2024 “Furthermore, this concept brings up the idea that humans and nature have a mutually needy relationship, where the sustainability of each depends on ethics and shared consciousness.”
	Humans as an Integral Part of Nature, Nature as an Extension of Humanity	7:20 p 9 in Yoon, 2021 “In the story, humanity can become an element of nature and serve nature as if they are natural elements, without transforming into natural elements themselves.” 7:21 p 8 in Yoon, 2021

		“This contrasts traditional notions that people are considered separate and superior to animals, but supports the idea that humanity is equal to other forms of natural life—that nature is an extension of humanity.”
	Humanity as Reorganizer of Nature	7:22 p 6 in Yoon, 2021
		“This folk narrative explains how human agency was involved in the rearrangement of the natural landscape of Kangwon Province, suggesting that the present display of mountainous landscape was due to a human’s bringing Ulsanam Peak into the region from the southern tip of the Korean Peninsula.”
Consequences of Environmental Exploitation	Consequence of Disregarding Sacred and Ecological Norms, Human Impact and Consequences of Environmental Exploitation, Symbolism of Natures Wrath	8:45 p 15 in Arianto et al., 2024 “The negative energy that comes out could disrupt the harmony and balance of nature, disturb spirits or Gods, and cause undesirable consequences.” 9:5 p 7 in Rajiv & Piraji, 2023 “However, due to human’s irresponsible behaviour and action towards nature, it is suffering and as a result, many environmental problems have arisen.” 9:21 p 11 Rajiv & Piraji, 2023 “Symbolism has been very tactfully employed to indicate the outcomes of destruction and damage caused to nature by humans.”
Cultural Transmission of Environmental Knowledge	Cultural Identity and Knowledge, Transmission through Folklore,	8:40 p 14 in Arianto et al., 2024 “This prohibition, accompanied by myths, is also a reflection of Malay identity closely tied to the environment.”

Cultural Wisdom	8:44 p 14 Arianto et al., 2024
Embedded in Myth	“The relationship between nature and society, particularly in the context of myths that prohibit damaging nature, reflected deep-rooted cultural and spiritual beliefs about the interconnectedness of humans and the natural world.”
Mythological Roots of	10:1 p 8 in Echarri-Iribarren, 2020
Environmental Ethics	“For example, Basque mythology can be used to establish a point of union to advance towards an adequate relationship with nature, towards a naturalistic affect with people through their ecological spiritual intelligence”

Sub-question 3: Synthesized framework of HNC and Application to Hypothetical Narrative

The purpose of the framework is to provide a new comprehensive model to better understand how mythologies and folklore contribute to fostering HNC. The framework was developed through a systematic synthesis of the results obtained from the thematic analysis answering the second sub-question. This process ensured that the framework is grounded in the findings and provides a cohesive model for understanding the role of mythology in fostering HNC. This framework synthesizes the identified themes, to offer an approach to conceptualize the interrelationship between cultural, spiritual, ethical and ecological dimensions of HNC (see Figure 2). In general, the model highlights the dynamic, bidirectional relationships between the themes.

Spiritual beliefs often guide the sense of ethical obligations and principles through moral stances toward interacting with the environment. Furthermore, they may also evoke mutual behaviours in humans, such as not over-exploiting resources or respecting the limits that mark ecological boundaries (Hilmi et al., 2024). On the other hand, an ethical relationship with nature renews spiritual values because spiritual values correspond with those of respect towards nature (Martemjen, 2024).

Moreover, spiritual and sacred relationships with nature shape the interconnectedness of all life forms, often portraying nature as an extension of humanity. This interconnectedness deepens spiritual reverence by highlighting the mutual dependence between humans and ecosystems (Yoon, 2021). For example, the practices of indigenous people consider humans as part of a larger natural balance which demonstrates the influence of interconnectedness on spiritual reverence (Hilmi et al., 2024).

Spiritual values and practices are often preserved and passed on through cultural narratives, rituals, and myths. They include rules for sustainable behaviour, such as taboos against damaging sacred ecosystems (Arianto et al., 2024). On the other hand, this cultural transmission keeps these spiritual beliefs alive and adapted for relevance to younger generations (Echarri-Iribarren, 2020).

Sacred beliefs act as a deterrent to exploitation by framing nature as something to be respected and protected. When exploitation occurs and these beliefs are violated, its consequences (e.g., loss of biodiversity, natural disasters) are explained through symbolic narratives, which has a reinforcing effect on the importance of sacred values and spirituality (Arianto et al., 2024; Rajiv & Piraji, 2023).

Ethical practices often stem from the idea of the interconnectedness of things, which in turn encourages behaviours that prevent disrupting the balance in ecosystems, whereas the understanding of reciprocal dependencies between humans and nature would inspire ethical principles by triggering sustainable practices like conserving resources and protecting all kinds of biodiversity (Rajiv & Piraji, 202; Hilmi et al., 2024).

Cultural narratives and traditions can be used to pass on ethical principles, maintaining their perpetuity and passing them down through generations. (Echarri-Iribarren, 2020). Taboos and rituals often include prescriptions for resource use, which in turn are based on ethical norms. These ethical norms shape what is culturally transmitted and inform future practices and values, thus sustaining both the narratives and the ecosystems they protect (Martemjen, 2024).

Ethical and reciprocal relationships with nature, prevent exploitation by fostering sustainable practices (Hilmi et al., 2024). When exploitation occurs, its negative consequences

highlight ethical failures and reinforce the need for more reciprocal care for nature (Rajiv & Piraji, 2023).

Cultural knowledge underlines the interdependence of humans with nature and teaches people their roles in maintaining ecological balance. Myths, for example, depicting humans and animals as interdependent beings point out the important relationship between species (Yoon, 2021). Interconnectedness, in turn, shapes the stories and practices passed down through cultural transmission (Arianto et al., 2024).

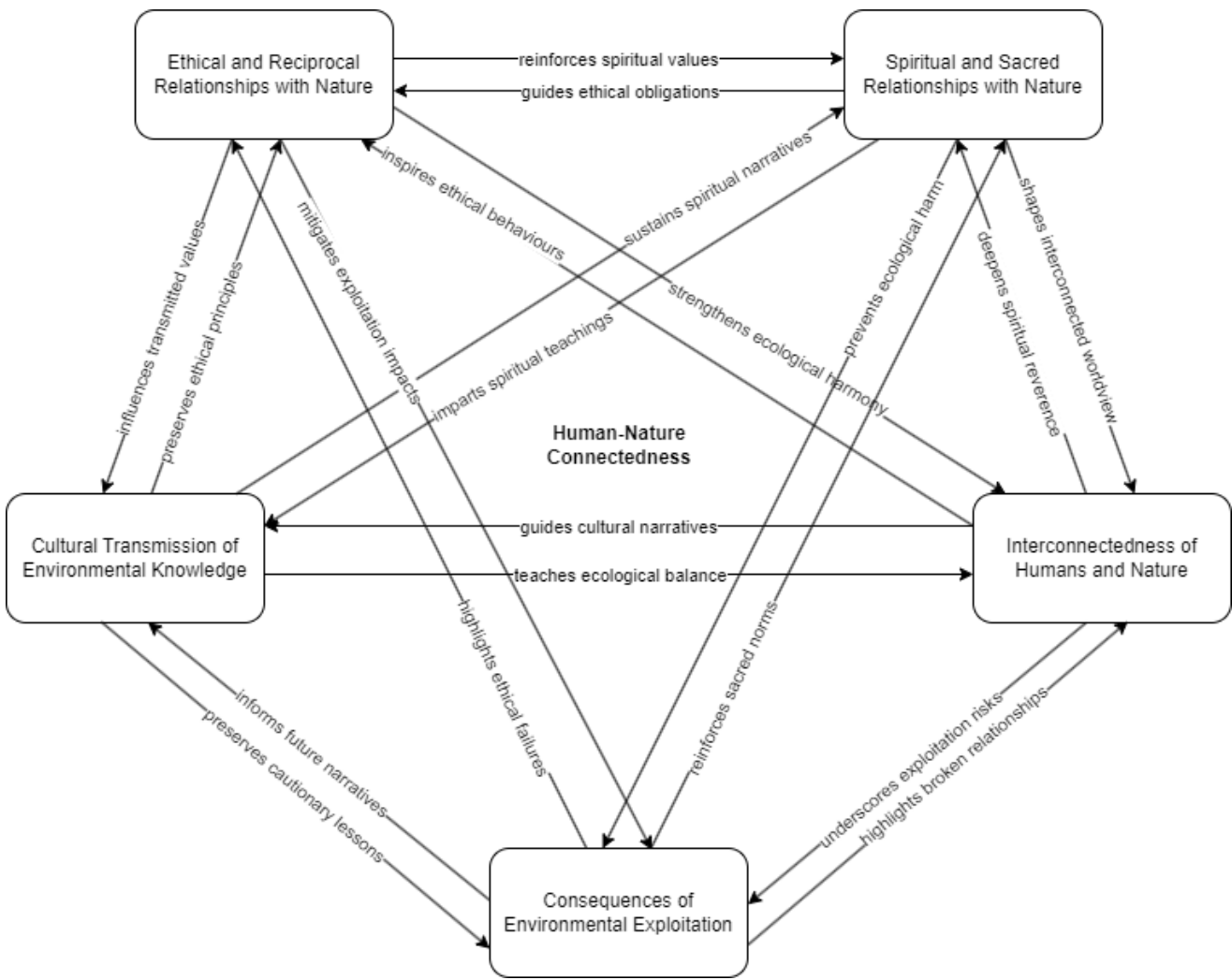
Disrupting the interconnectedness of ecosystems through exploitation often results in visible consequences, such as ecosystem collapse or climate change (Rajiv & Piraji, 2023). These impacts underline the aspect of ecological balance and encourage further steps toward understanding and preserving such interconnected systems (Arianto et al., 2024).

The process of cultural transmission of environmental knowledge often embeds lessons about the consequences of exploiting nature in a way that ensures these warnings are retained by future generations (Arianto et al., 2024). On the other hand, observing exploitation and its outcomes, for example deforestation leading to flooding, provides material for creating or updating cultural narratives (Rajiv & Piraji, 2023).

In turn, these themes interlink with each other to form a dynamic system that promotes HNC. These relationships reflect the multidimensionality of HNC where spirituality, ethics, interconnectedness, cultural knowledge, and ecological outcomes continuously inform and reinforce one another through an overall coherent process, demonstrating their interaction in reinforcing and evolving over time to preserve HNC.

Figure 2

Synthesized Theoretical Framework of HNC



A hypothetical narrative of a mountain village is considered in the following example for deeper understanding of how the proposed framework fosters HNC and to show the cyclic relationships between themes. The example shows how mythologies and folklores act as catalysts in fostering HNC by moving through spiritual reverence, ethical practices, and connectedness while incorporating feedback from environmental consequences.

Hypothetical Narrative

“A mountain village holds a myth about a sacred forest at the mountain's base, believed to be the dwelling place of protective spirits who guard the community from avalanches and erosion. This mythology, transmitted in songs, rituals, and oral traditions, is as a means of **cultural transmission of environmental knowledge** that inculcates into the community's identity the lessons of ecological importance and sacred status of the forest. This cultural transmission fosters **spiritual and sacred relationships with nature**, where the forest is seen not just as a resource but as a sacred entity deserving respect and protection. This spiritual reverence inspires **ethical and reciprocal relationships with nature**, where the villagers engage in practices such as sustainable wood harvesting, limiting cutting to essential needs, and designating certain trees as untouchable due to their spiritual significance. These ethical practices deepen the community's sense of **interconnectedness of humans and nature**, as they observe how the forest prevents landslides, purifies water, and provides resources essential for their survival. However, external pressures lead to the partial clearing of the forest for development, violating its sacred principles. Soon after, heavy rains trigger a landslide, destroying homes and fields. This disaster is interpreted as a **consequence of environmental exploitation**, reinforcing the mythology's warnings about dishonouring the sacred forest. The consequences serve as a cautionary tale, incorporated back into the community's cultural transmission, renewing spiritual reverence, ethical commitments, and efforts to preserve the forest, thereby sustaining **Human-Nature Connectedness (HNC)**.”

Discussion

The objective of this study is to explore qualitative studies that research the concept of HNC from a mythological and folkloristic perspective and indicate how cultural narratives shape

and influence humanity's relationship to the natural world. In this respect, the characteristics of these studies are investigated and how they further conceptualize HNC. By conducting an integrative literature review, the study further aims to identify key themes and recurring patterns of these scientific articles that contribute to better understand the relationship between HNC, mythologies and folklore. Furthermore, the key themes are synthesised into a theoretical framework, offering real life applicability to diverse contexts.

Sub 1: Conceptualization of HNC and Characteristics of Reviewed Articles

The analysis of the reviewed articles shows that HNC is a notion very strongly laced into the realm of cultural narratives through mythology and folklore. Within diverse cultural contexts, such narratives reflect and actually determine how communities engage with natural environments. All articles investigated adopt a qualitative approach and, hence, apply different methodologies—narrative analysis, ethnography, literary analysis, and case studies—in order to study the relationship between mythology, folklore, and HNC. These studies span diverse cultural contexts, including Malay, Indian, Naga, Korean, Santal, Balinese, and Basque cultural narratives. Overall, the articles conceptualize HNC as a multidimensional construct, encompassing spiritual, ethical and ecological relationships. This is in line with findings of Riechers et al. (2020) stating that the concept of HNC has multiple dimensions, for instance philosophical and emotional dimensions, which are strongly interlinked.

Sub 2: Identified Key Themes and Relationships Between Mythologies, Folklore and HNC

Five overarching themes emerged from the analysis: Spiritual and Sacred Relationships with Nature, Ethical and Reciprocal Relationships, Interconnectedness of Humans and Nature, Consequences of Environmental Exploitation, and Cultural Transmission of Environmental Knowledge. Together, these themes imply how mythology and folklore may inform respect,

stewardship, and sustainability in HNC. For instance, the theme of spirituality imbues ecological ethics with a moral dimension, and narratives of environmental exploitation warn against unsustainable practices. The role that mythology and folklore play in fostering HNC is further researched in a study by Ikonen et al. (2024) that suggest using these stories in education to enhance environmental education and introducing alternative ways of relating to nature.

Sub 3: Synthesis of Themes in New Theoretical Framework

The synthesis of themes into one theoretical framework underscores the dynamic interplay between cultural narratives and HNC. It does so by pointing out the interconnected and changing nature of spirituality, ethics, interconnectedness, cultural transmission, and environmental consequences that show these themes in mythology and folklore to support a deep and meaningful relationship between humans and the natural world. The self-reinforcing, cyclical nature thereof provides valuable insight into how folklore and mythology may actually support and be put into practice for such a relationship.

Strengths

It is important to emphasize, that the proposed framework is a pioneering approach in understanding HNC, offering important insights into the field of psychology. So far, it appears that no prior framework has addressed this relationship in this manner. Therefore, the proposed new theoretical framework for HNC has several advantages. Firstly, the model captures the multifaceted nature of HNC through integrating five key themes. It does so while offering a wide view of how these elements interact and thus is applicable in most cultural, environmental, and psychological contexts. For example, the theme “Cultural Transmission of Environmental Knowledge” speaks of cultural relevance and uses the function of myths and folklore in shaping values relevant for the preservation and application of local cultural wisdom in modern

environmental contexts. This is further supported by research that has outlined the ecological significance of folklore in promoting sustainable behaviour. For example, a study by Hiiemäe (2024) discusses how traditional stories and other forms of cultural expression can enhance environmental education by embedding ecological knowledge in engaging narratives. A second aspect is the dynamic relationship between the themes, showing how they influence and reinforce one another over time. It reflects the evolving and holistic nature of HNC, showing how cultural narratives can respond and influence changes in the environment. Through the model's adaptable nature to diverse contexts and universal themes, such as spirituality, ethics, and interconnectedness, it offers practical applicability, e.g. guiding conservation efforts. Additionally, the empirical foundation of the model sets a stepping stone for the inclusion of studies of mythologies and folklore in education to support the development of HNC. The model has potential in filling the gap of science and tradition since it offers new solutions based on traditional local insights along with scientific ones. By doing so, the model also places an important value on both knowledge sets. It creates an opportunity for the communities and scientists collaborate to find solutions to environmental concerns, which is appropriate for use in public education and environmental action. The article by Kimmerer (2012) points out the integration of traditional ecological knowledge with scientific ecological knowledge to form a more well-rounded insight into ecosystems toward workable sustainable solutions between nature and culture. Furthermore, the framework creates new possibilities to move on from individual based studies towards more community-based approaches which were shown to be still limited in current research (Sheffield et al., 2022).

Limitations

Several limitations need to be discussed regarding the bias of the sample used in the study as well as the limitations of studies results, especially the synthesized theoretic framework. In general, one important limitation arises from the thematic analysis approach. While effective to bring out recurring patterns and themes, it does involve some subjectivity in data interpretation. The process of coding, while systematic, is still done from the perspective of a single researcher which might introduce bias in theme selection and organization. This issue with subjectivity of theme identification could be avoided through the involvement of multiple researchers (Olson et al., 2016). Furthermore, limitations regarding the inclusion, exclusion criteria and of the comprehensive search string used in this study must be addressed. Firstly, the thesis relied only on one single reviewer investigating the two databases Scopus and Web of Science which might exclude relevant studies from other sources, for example regional journals, leading to potential publication bias. This is a common problem with the validity of the systematic reviews. As indicated in the work of Ayorinde et al. (2020), this is linked with a predisposition for such reviews to focus too much, in their final analysis, on the most significant findings in the published literature, often creating a summary of the findings with biased distortions. The exclusion of older publications to maintain relevance may have overlooked important or historical insights into mythology, folklore and HNC. Finally, this review only investigated peer-reviewed articles that were written in English, limiting the representation of non-Western perspectives on HNC, making it difficult to generalize the findings. Taken together, this research raises important consideration regarding the issue of positionality.

The issues resulting from the systematic approach and the used search string further urges the need of a careful examination of the synthesized framework. As mentioned, the framework

emphasizes cultural narratives that were investigated through English language, peer reviewed and published articles. It relies heavily on articles that investigate specific myths and folklore in the context of HNC. This confines the applicability of the model to communities where such narratives are no longer salient. Another important limitation of this model is the limited incorporation of postcolonial contexts. While it highlights cultural narratives, it underemphasizes the power and historical factors, like economic exploitation and eco-fascism, that have strongly shaped and still shape HNC. It does not explicitly account for how social, political, or economic inequalities influence access to natural resources fostering HNC. Artmann (2023) argues for the importance of incorporating diverse ontologies, including Indigenous perspectives, which emphasize relational and non-hierarchical connections. The lack of explicit integration of these diverse ontologies into a framework limits its capacity to address the social, political, and economic inequalities that influence access to natural resources and the formation of HNC. Overall, these limitations highlight the need for future research to broaden the scope of sources and to consider more diverse cultural and linguistic contexts.

Future Implication

By carefully evaluating the strengths and limitations of the model several aspects should be pointed out to guide future research, practical implementation and further theoretical development. To establish the frameworks credibility and effectiveness the model should be empirically validated and tested. Therefore, validated scales, such as the Nature Relatedness Scale (Nisbet & Zelenski, 2013) or the Connectedness to Nature Index (Richardson et al., 2019) could be used. As mentioned, future research should address power dynamics and ethical considerations of the model. Here local communities could be involved in the refinement process and application through participatory methods, such as workshops, focus groups, and

incorporating the community feedback. This would ensure that it reflects their values and priorities. Furthermore, findings from other empirical studies should be used to refine the framework and address the limitation and gaps that the proposed model entails. Empirical research is crucial for validating the model and uncover areas for improvement. In quantitative research, large scale surveys could be conducted across diverse cultural and ecological contexts, to assess generalizability. Whereas in qualitative research, further narrative analyses of myths and folklore should be conducted to refine the models' dimensions. Adapting the models theoretical frame, could make it more robust and applicable. Interdisciplinary insights with theories from psychology, anthropology, and environmental science should be incorporated and external factors (e.g. globalization, technology) should be explored.

Conclusion

This study explores how examining qualitative narrative and literary analyses of mythology and folklore contribute to the understanding of HNC within specific cultural and environmental contexts. Through an integrative review of existing literature, key themes emerged that link mythology and folklore to HNC. Through these themes a theoretical framework was developed. This framework emphasizes dynamic, cyclical relationships between spirituality, ethical reciprocity, interconnectedness, environmental impacts, and cultural knowledge. The findings are an important contribution to the field since they allocate cultural narratives within its conceptualization of HNC. By combining scientific insights with traditional cultural narratives, the framework supports collaboration between communities and scientists to include ecological and cultural sustainability. Additionally, future studies should empirically test and refine this framework to validate its applicability and effectiveness in real-world settings. This might enable the framework to emerge as good tool to promote HNC and tackle

contemporary environmental challenges. This research forms a foundation for further advancement of theoretical approaches focused on fostering humanity's connection with the natural world in a manner that honours cultural diversity and promotes sustainability.

Acknowledgements

I would like to express my gratitude to Blindboy Boatclub, whose insightful podcast on mythology, folklore, mental health, and art inspired me to explore the intersections of cultural narratives and HNC. His unique perspective and engaging discussions (hot takes) sparked my curiosity that became the foundation for this research.

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Appendix A

CASP Checklist Arianto et al.



CASP Checklist: 10 questions to help you make sense of a **Qualitative** research

How to use this appraisal tool: Three broad issues need to be considered when appraising a qualitative study:

- ▶ Are the results of the study valid? (Section A)
- ▶ What are the results? (Section B)
- ▶ Will the results help locally? (Section C)

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is “yes”, it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a “yes”, “no” or “can’t tell” to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

About: These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA ‘Users’ guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

Referencing: we recommend using the Harvard style citation, i.e.: *Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Qualitative) Checklist. [online] Available at: URL. Accessed: Date Accessed.*

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Paper for appraisal and reference: **The Ethnoecology of the Malay Sacred Myth through Narr:**

Section A: Are the results valid?

1. Was there a clear statement of the aims of the research?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

- HINT: Consider
- what was the goal of the research
 - why it was thought important
 - its relevance

Comments: The study clearly aimed to explore the ethnoecology of Malay sacred myths through narratives from the Kampung Tua Nongsa community in Batam. It sought to understand how these myths influence the community's relationship with their natural environment.

2. Is a qualitative methodology appropriate?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

- HINT: Consider
- If the research seeks to interpret or illuminate the actions and/or subjective experiences of research participants
 - Is qualitative research the right methodology for addressing the research goal

Comments: The research seeks to interpret and illuminate the cultural and ecological significance of myths, making qualitative methodology the right approach for exploring subjective experiences and cultural narratives.

Is it worth continuing?

3. Was the research design appropriate to address the aims of the research?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

- HINT: Consider
- if the researcher has justified the research design (e.g. have they discussed how they decided which method to use)

Comments: The researchers employed a qualitative design that was appropriate for the exploratory nature of the study, allowing for in-depth examination of the cultural narratives and their ecological implications.

4. Was the recruitment strategy appropriate to the aims of the research?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: Consider

- If the researcher has explained how the participants were selected
- If they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study
 - If there are any discussions around recruitment (e.g. why some people chose not to take part)

Comments: The participants were selected from the Kampung Tua Nongsa community, which is relevant because the study focused on the community's myths and ecological practices. The selection of participants was well-justified to access the specific knowledge needed.

5. Was the data collected in a way that addressed the research issue?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: Consider

- If the setting for the data collection was justified
- If it is clear how data were collected (e.g. focus group, semi-structured interview etc.)
- If the researcher has justified the methods chosen
 - If the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews are conducted, or did they use a topic guide)
 - If methods were modified during the study. If so, has the researcher explained how and why
 - If the form of data is clear (e.g. tape recordings, video material, notes etc.)
 - If the researcher has discussed saturation of data

Comments: Data was collected through interviews and participant observations, which were suitable methods for capturing the depth and nuance of cultural narratives. The methods were explicitly described and justified.

6. Has the relationship between researcher and participants been adequately considered?

Yes	<input type="checkbox"/>
Can't Tell	<input checked="" type="checkbox"/>
No	<input type="checkbox"/>

HINT: Consider

- If the researcher critically examined their own role, potential bias and influence during (a) formulation of the research questions (b) data collection, including sample recruitment and choice of location
- How the researcher responded to events during the study and whether they considered the implications of any changes in the research design

Comments: The article does not provide detailed information about the relationship between the researchers and participants, or how potential biases were managed during the study.

Section B: What are the results?

7. Have ethical issues been taken into consideration?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: Consider

- If there are sufficient details of how the research was explained to participants for the reader to assess whether ethical standards were maintained
- If the researcher has discussed issues raised by the study (e.g. issues around informed consent or confidentiality or how they have handled the effects of the study on the participants during and after the study)
 - If approval has been sought from the ethics committee

Comments: The study mentions that ethical considerations were taken into account, including informed consent and confidentiality, although detailed information about ethics approval is not provided.

8. Was the data analysis sufficiently rigorous?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: Consider

- If there is an in-depth description of the analysis process
- If thematic analysis is used. If so, is it clear how the categories/themes were derived from the data
- Whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process
- If sufficient data are presented to support the findings
 - To what extent contradictory data are taken into account
- Whether the researcher critically examined their own role, potential bias and influence during analysis and selection of data for presentation

Comments: The data analysis involved thematic analysis, and the article provides an in-depth description of how themes were derived from the data. There is sufficient presentation of data to support the findings.

9. Is there a clear statement of findings?

Yes	<input checked="" type="checkbox"/>
Can't Tell	<input type="checkbox"/>
No	<input type="checkbox"/>

HINT: Consider whether

- If the findings are explicit
- If there is adequate discussion of the evidence both for and against the researcher's arguments
- If the researcher has discussed the credibility of their findings (e.g. triangulation, respondent validation, more than one analyst)
- If the findings are discussed in relation to the original research question

Comments: The findings are clearly stated and discussed in relation to the research question. The study provides a balanced discussion of the evidence and considers alternative interpretations.

Section C: Will the results help locally?

10. How valuable is the research?

HINT: Consider

- If the researcher discusses the contribution the study makes to existing knowledge or understanding (e.g. do they consider the findings in relation to current practice or policy, or relevant research-based literature
- If they identify new areas where research is necessary
- If the researchers have discussed whether or how the findings can be transferred to other populations or considered other ways the research may be used

Comments: The research contributes to understanding the role of cultural narratives in shaping ecological practices, which is valuable for both local community conservation efforts and broader discussions on the integration of cultural knowledge in environmental management. The study identifies areas for future research and considers the applicability of the findings to other similar communities.

--> Based on the aforementioned, this article scores 8 out of 10 points regarding the value for my integrative review

Appendix B

Theme 1

Spiritual and Sacred Relationships with Nature

Code	Definition	Quotes
Spiritual and Ethical Relationship, Spiritual and Sacred Relationship with Nature	Focus on the integration of moral, spiritual beliefs and ethical obligations toward nature.	12:21 p 6 in Hilmi - Human and nature relations in Hooykaas “This concept signifies that human interaction with nature not only involves physical actions or exploitation of resources but also requires a comprehensive ethical foundation. Nature is not just a passive object that can be utilised without moral consideration but rather an entity that requires attention and protection.”
Spiritual and Cultural Stewardship of Nature	Emphasizes active, culturally rooted care for the environment	8:41 p 14 in Arianto et al., - The Ethnoecology of the Malay Sacred Myth through Narratives of Kampung Tua Nongsa in Batam

<p>Personification of Earth, Personification and Feminization of Nature</p>	<p>Reflects how nature is seen as sentient and often feminine, paralleling human experiences and resilience</p>	<p>“Excerpt (11) reflects the emphasis on maintaining cleanliness as a form of a broader commitment to environmental stewardship.”</p> <p>12:8 p 5 in Hilmi - Human and nature relations in Hooykaas</p> <p>“Therefore, this concept encourages the adoption of an ethic of care for the environment, viewing nature not only as a resource that can be utilised but also as a living partner that needs to be safeguarded with a sense of responsibility and wisdom.”9:14 p 9 in Rajiv & Piraji - Cultural Implications of Nature and Eco-Consciousness in Select 21st</p> <p>“Women and nature are culturally seen as possessing the same qualities and therefore, nature is feminized. In both novels, Madhavan sets a strong bondage of her</p>
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protagonists with nature and endorses a deep association of her female characters with nature.”

Theme 2

Ethical and Reciprocal Relationships with Nature

Codes	Definition	Quotes
Ethical and Reciprocal Relationship with Nature	Addresses the moral obligations human have towards nature in exchange for its benefits	13:15 p 3 in Martemjen - Biodiversity Conservation Ethos in Naga Folklore and Folksongs “Observance of taboos and genna were a guiding principle in the lives of the Nagas as far as their relationship with the natural environment is concerned.”
Cultural Mechanisms for Biodiversity Conservation, Community-Led Environmental Action	Reflects collective, community-led practices to safeguard biodiversity and promote sustainable living	11:15 p 7 in Hembrom - A study of Santals as children of nature in the light of Santal folktales “The Santal stories do not shy away from personifying the animals” 13:14 p 3 in Martemjen - Biodiversity Conservation Ethos in Naga Folklore and Folksongs

“In the Phom Naga saying that states “Phongpenn Phaünyü Loihamnyih Paikok Vü Kao Tülangtük”, meaning “Don’t cut the stem of this plant; it will feed you during famine” 8. Such strict adherence of belief and practices has led to deeper understanding of living Mother Nature, enabling people to protect and preserve the environment around them.”

8:33 p 12 in Arianto et al., - The Ethnoecology of the Malay Sacred Myth through Narratives of Kampung Tua Nongsa in Batam

“According to the myth, a dragon launched from Nongsa Island to the sea, creating Putri Island. The sacred significance of Nongsa Island, its beach, and Putri Island is upheld by various prohibitions, indicating profound and sacred values linked to Batu Belah and these locations among the Malay community.”

Human Impact on Nature
and Ecological
Responsibility

Focuses on the
responsibility of humans to
mitigate the environmental

12:35 p 9 in Hilmi - Human and nature relations in Hooykaas

“It involves active participation in the preservation and restoration of the environment with the understanding that every action has an

	consequences of their actions	impact that transcends the boundaries of a particular geographical area.”
Nature as a Source of Livelihood and Survival	Underscores the reliance on nature for essential resources, and reinforcing the idea of reciprocal care and sustainable use	11:8 p 6 in Hembrom - A study of Santals as children of nature in the light of Santal folktales “In their moments of need, nature stands by them like a mother, providing food for them. The Santals collect their food from the jungle. The characters are mostly involved in agricultural work. They know how to survive in a critical situation. In the tale ‘Lakhan and the Wild Buffaloes,’ for example, the hero, Lakhan, survives in the forest by drinking wild buffaloes’ milk. Again, in the tale, ‘Kara and Guja’, the two brothers, Kara and Guja, go to the forest to dig some roots to eat.”

Theme 3

Interconnectedness of Humans and Nature

Code	Definition	Quotes
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<p>Interconnectedness and Balance with Nature, Interconnectedness and Holistic Views, Ecological Balance with Nature</p>	<p>Highlights the mutual dependence and need for balance within ecosystems</p>	<p>9:6 p 8 in Rajiv & Piraji - Cultural Implications of Nature and Eco- Consciousness in Select 21st “In the novel, the fisherman tribe takes from nature what they need and not more without dehiscing their ecology” 12:23 p 6 in Hilmi - Human and nature relations in Hooykaas “Furthermore, this concept brings up the idea that humans and nature have a mutually needy relationship, where the sustainability of each depends on ethics and shared consciousness.”</p>
<p>Humans as an Integral Part of Nature, Nature as an Extension of Humanity</p>	<p>Humans and nature as inseparable, with human existence deeply embedded within natural systems</p>	<p>7:20 p 9 in Yoon - Ideas relating to humanity nature relationships in Korean folk narratives reflecting geomantic values “In the story, humanity can become an element of nature and serve nature as if they are natural elements, without transforming into natural elements themselves.” 7:21 p 8 in Yoon - Ideas relating to humanity nature relationships in Korean folk narratives reflecting geomantic values</p>

Humanity as Reorganizer of Nature	Human role in actively shaping and reorganizing nature, reinforcing the interdependent relationship	<p>“This contrasts traditional notions that people are considered separate and superior to animals, but supports the idea that humanity is equal to other forms of natural life—that nature is an extension of humanity.”</p> <p>7:22 p 6 in Yoon - Ideas relating to humanity nature relationships in Korean folk narratives reflecting geomantic values</p> <p>“This folk narrative explains how human agency was involved in the rearrangement of the natural landscape of Kangwon Province, suggesting that the present display of mountainous landscape was due to a human’s bringing Ulsanam Peak into the region from the southern tip of the Korean Peninsula.”</p>
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Theme 4

Consequences of Environmental Exploitation

Codes	Definition	Quotes
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Consequence of Disregarding Sacred and Ecological Norms	Emphasizes the moral and spiritual consequences of violating natures sacred/ecological boundaries	8:45 p 15 in Arianto et al., - The Ethnoecology of the Malay Sacred Myth through Narratives of Kampung Tua Nongsa in Batam “The negative energy that comes out could disrupt the harmony and balance of nature, disturb spirits or Gods, and cause undesirable consequences.”
Human Impact and Consequences of Environmental Exploitation	Reflects outcomes of human actions that destroy the environment, including biodiversity	9:5 p 7 in Rajiv & Piraji - Cultural Implications of Nature and Eco-Consciousness in Select 21st “However, due to human’s irresponsible behaviour and action towards nature, it is suffering and as a result, many environmental problems have arisen.”
Symbolism of Natures Wrath	Illustrates how myths personify nature as a force that is capable of punishing humans for exploitation and disrespect	9:21 p 11 in Rajiv & Piraji - Cultural Implications of Nature and Eco-Consciousness in Select 21st “Symbolism has been very tactfully employed to indicate the outcomes of destruction and damage caused to nature by humans.”

Theme 5

Cultural Transmission of Environmental Knowledge

Code	Definition	Quotes
Cultural Identity and Knowledge Transmission through Folklore	Highlights how Folklore can transmit cultural identity and ecological practices across generations	8:40 p 14 in Arianto et al., - The Ethnoecology of the Malay Sacred Myth through Narratives of Kampung Tua Nongsa in Batam “This prohibition, accompanied by myths, is also a reflection of Malay identity closely tied to the environment.”
Cultural Wisdom Embedded in Myth	Reflects how ecological insights and moral lessons are embedded in myths	8:44 p 14 in Arianto et al., - The Ethnoecology of the Malay Sacred Myth through Narratives of Kampung Tua Nongsa in Batam “The relationship between nature and society, particularly in the context of myths that prohibit damaging nature, reflected deep-rooted cultural and spiritual beliefs about the interconnectedness of humans and the natural world.”
Mythological Roots of Environmental Ethics	Highlights how mythology provides a foundation for ethical practices and	10:1 p 8 in Echarri-Iribarren & Echarri-Iribarren - environmental-education-and-ecological-spiritual-intelligence-the-case-of-basque-mythology

environmental stewardship and shape behaviours and values toward sustainability “For example, Basque mythology can be used to establish a point of union to advance towards an adequate relationship with nature, towards a naturalistic affect with people through their ecological spiritual intelligence”

Appendix C

Checklist for Integrative Reviews by Torraco (2005)

Torraco / LITERATURE REVIEW GUIDELINES 365

TABLE 2: A Checklist for Writing an Integrative Literature Review

Before Writing an Integrative Literature Review

- (a) What type of review article will be written (i.e., review of a new topic or a mature topic?). Is an integrative literature review the most appropriate way to address the research problem?
- (b) Is there a *need* for the integrative literature review? Will the review article make a significant, value-added contribution to new thinking in the field?

Organizing an Integrative Literature Review

- (c) Is the review article organized around a coherent conceptual structuring of the topic (e.g., a guiding theory, a set of competing models)?
- (d) Are the methods for conducting the literature review sufficiently described? How was literature selected? What keywords and procedures were used to search the literature? What databases were used? What criteria were used for retaining or discarding the literature? How was the literature reviewed (e.g., complete reading of each piece of literature, reading of abstracts only, a staged review)? How were the main ideas and themes from the literature identified and analyzed?

Writing an Integrative Literature Review

- (e) Does the article critically analyze existing literature on the topic (i.e., is a critique provided)?
 - (f) Does the article synthesize knowledge from the literature into a significant, value-added contribution to new knowledge on the topic?
 - (g) What forms of synthesis are used to stimulate further research on the topic? A research agenda (research questions or propositions), a taxonomy (or other conceptual classification of constructs), an alternative model or conceptual framework, or metatheory (theory that transcends the topic and bridges theoretical domains).
 - (h) Does the article describe the logic and conceptual reasoning used by the author to synthesize the model or framework from the review and critique of the literature?
 - (i) Are provocative questions for further research presented to capture the interest of scholars?
-

