

Mics: Az erdők és természeti élőhelyek [The importance of forest]

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## THE IMPORTANCE OF FORESTS AND NATURAL HABITATS - ECOTHEOLOGICAL AND HUMAN-ECOLOGICAL ASPECTS

### [AZ ERDŐK ÉS A TERMÉSZETI ÉLŐHELYEK FONTOSSÁGA - ÖKOTEOLÓGIAI ÉS HUMÁNÖKOLÓGIAI SZEMPONTOK]

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**Abstract.** Forests and natural ecosystems are essential for sustaining life on our planet, playing a critical role in maintaining biodiversity, regulating climate patterns and facilitating the hydrological cycle. However, these critical ecosystems face a range of threats, from deforestation to climate change, requiring concerted efforts by global, national and local stakeholders to ensure their conservation. This paper explores the emergence, prominent figures, key perspectives and recent influences of ecotheology. The interconnectedness of ecological, economic and cultural dimensions highlights the urgent need for effective conservation strategies and mitigation policies at all levels, from grassroots initiatives to global agreements, to protect and sustainably manage these invaluable natural resources. The historical, current and future functions of forests in these contexts illustrate the importance of collaborative efforts combining ecological responsibility with theological insights and the evolving field of human ecology.

**Keywords:** ecology, ecosystem, environmental protection, religion, sustainable development

#### The ecological importance of forests

Forests and natural habitats are essential for life on Earth. They form complex ecosystems that are vital for maintaining biodiversity, regulating climate, sustaining the water cycle, developing the economy, and fostering social and cultural relationships. However, these critical ecosystems face a range of threats, from deforestation to climate change, requiring concerted efforts by global, national and local stakeholders to ensure their conservation.

According to recent research, forests cover almost 30 percent of the planet's land surface (Chen et al., 2020), Forests have a significant carbon sequestration capacity: it is estimated that forests account for more than 45 percent of the carbon stored on land and sequester about  $2.4 \pm 0.4$  gigatonnes of carbon per year (Crockett et al., 2021; Chang et al., 2023), and provide habitat for more than half of the terrestrial plant and animal species identified on the planet (Pillay et al., 2021). Tropical rainforests in particular are often considered the crown jewel of Earth's biodiversity, teeming with plant, animal and insect species (Raven et al., 2020). The Amazon rainforest, for example, is

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home to about 40,000 plant species, 1,300 bird species, 1,220 mammal species and 2.5 million different insect species (Terborgh and Feeley, 2016; Amidon, 1973, WWF., 2010; Novotny and Weiblen, 2005). Conserving this biodiversity is vital not only for the species themselves, but also for the ecological services they provide, such as pollination, seed dispersal and control of natural pests (Alamgir et al, 2016).

Forests play an important role in climate regulation as they act as major carbon sinks (Lukina et al., 2020). An analysis by Pan et al. (2024) showed that the carbon sequestration capacity of global forests remained relatively constant, at  $3.6 \pm 0.4 \text{ Pg C yr}^{-1}$  in the 1990s and 2000s, and then declined slightly to  $3.5 \pm 0.4 \text{ Pg C yr}^{-1}$  in the 2010s. Trees store carbon dioxide in their biomass and soils, which helps to reduce atmospheric concentrations of greenhouse gases (Walker et al., 2022). However, deforestation causes forests to release stored carbon, which further increases global warming. According to the Intergovernmental Panel on Climate Change (IPCC), deforestation contributes to about 10-15% of global carbon emissions (Pearson et al., 2017).

Forests are an integral part of the global hydrological cycle (Zhang, et al., 2017). They contribute to precipitation through a process called transpiration, whereby water is absorbed by roots and then released from leaves into the atmosphere. This process not only affects local climate, but also influences global weather patterns, far beyond the forest itself (Frank et al., 2015). For example, the Amazon rainforest, often referred to as the 'lungs of the earth', emits huge amounts of water vapour that travels across South America and influences rainfall patterns. Forests also contribute to maintaining water quality by filtering pollutants and sediment, thus ensuring access to clean water for millions of people (Brouwer et al., 2022).

Forests provide a wide range of economic resources, including timber and non-wood products (Hurmekoski et al., 2018; Weiss et al., 2020). Wood from different species is used in construction, furniture and paper production. The global market for wood is significant, contributing billions of dollars to the world economy each year. In addition to timber, forests also produce non-wood products such as fruits, nuts, resins and medicinal plants. These resources can be harvested in a sustainable way, providing economic benefits while maintaining the ecological balance of the forest.

Natural habitats are also a focal point for the booming ecotourism industry (Stronza et al., 2019). Ecotourism provides economic incentives for habitat conservation by generating revenue from environmentally conscious travel (Umuziranenge and Muhurwa, 2017). Protected areas and well-managed nature reserves attract tourists eager to experience the natural beauty and biodiversity of forests. Revenue from ecotourism can support local economies and fund conservation initiatives, creating a sustainable cycle of financial and environmental benefits (Huda Farhana and Mohd Parid, 2022).

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The ecosystem services provided by forests, such as pollination, nutrient cycling and water filtration, have enormous economic value (Navrud and Strand, 2017). Payments for Ecosystem Services (PES) - programs that exchange value for land management practices that provide or ensure ecosystem services - have grown significantly in recent decades, with more than 550 active programs worldwide and annual transactions estimated at \$36-42 billion (Salzman et al., 2018).

Mangrove forests, for example, provide coastal protection services that prevent storm surges and erosion, saving billions of dollars in damage. Accurate valuation of these services can encourage investment in conservation and sustainable management practices, highlighting the economic imperative to conserve natural habitats (Himes-Cornell et al., 2018).

Forests are vital to the livelihoods of many indigenous peoples who have lived in these ecosystems for thousands of years and managed them sustainably. They rely on forests for food, shelter and medicinal resources (Fisher et al., 2018). The Kayapo people of the Brazilian Amazon, for example, not only use the forest to meet their immediate needs, but also engage in sustainable practices that ensure future productivity. The conservation of these ancestral lands is of paramount importance not only for the survival of these communities, but also for the preservation of their invaluable traditional knowledge on biodiversity and sustainable management (Garcia et al., 2024).

Forests are of great cultural and spiritual importance to communities around the world. They play a prominent role in myths, folklore and rituals, and serve as key sites of cultural identity (Amlor and Alidza, 2016). Sacred groves in India, for example, are patches of forest that communities protect for their religious significance. These groves are oases of biodiversity and reflect the intertwining of culture and conservation. The conservation of these areas helps to perpetuate cultural traditions and heritage, and fosters a deep connection between people and nature (Sharma and Kumar, 2021).

Forests and natural habitats offer a myriad of recreational opportunities, from hiking and bird watching to educational tours and wellness retreats (Fernando and Kaluarachchi, 2016). Access to natural areas has a range of physical and mental health benefits. Stier-Jarmer et al. (2021) have shown that time spent in nature reduces stress, improves mood and enhances cognitive function. Recreational activities also help to promote environmental awareness and conservation efforts by building connections between people and nature, leading to greater social support for conservation initiatives (Fairbrother, 2016).

Deforestation, driven by agricultural expansion, logging and infrastructure development, is a major threat to forests worldwide (Maretto et al., 2020). Between 2000 and 2012, a net loss of 1.71 million km<sup>2</sup> of forest was lost, representing 3.2% of total forest area (Riitters et al., 2012). This loss not only results in the destruction of biodiversity, such as habitats for endangered species, but also disrupts the ecological



functions provided by forests (Bodo et al., 2021). Combating deforestation requires a combination of increased regulation, sustainable land use planning and community engagement to ensure responsible forest management.

The integrity of forests is further threatened by pollution and climate change. Industrial pollution, such as acid rain, damages tree health and soil quality, while climate change causes changes in temperature and precipitation distribution that stress forests (Sicard et al., 2016). Boreal forests, for example, are particularly vulnerable to climate change due to increased frequency of wildfires and pest outbreaks (Venäläinen et al., 2020). Mitigation strategies include reducing greenhouse gas emissions, controlling pollution, and implementing climate-adaptive forest management practices to make forests more resilient to changing conditions (Fawzy et al., 2020).

Effective conservation strategies and initiatives are key to addressing the threats to forests. At international level, agreements such as the Paris Agreement aim to reduce carbon emissions and promote sustainable forest management. At the national level, policies that encourage reforestation, protect existing forests, and enforce sustainable logging practices are essential (Murphy-Gregory and Gale, 2019). Efforts that involve the collaboration of governments, NGOs, and local communities are key to the successful implementation of these strategies. Community-based conservation initiatives, in particular, empower local people to manage their resources in a sustainable manner, ensuring long-term viability (Duguma et al., 2018).

The importance of forests and natural habitats cannot be overstated. As a vital repository of biodiversity, they play an indispensable role in regulating climate and maintaining the hydrological cycle, while making a significant contribution to the global economy through resources and ecotourism. From a social and cultural perspective, forests are vital for the livelihoods of indigenous communities, the preservation of cultural heritage and the provision of recreational opportunities that enhance human well-being.

Threats such as deforestation, pollution and climate change underline the urgent need for effective mitigation strategies and conservation policies. From local communities to international agreements, efforts must be made at all levels to protect and sustainably manage these irreplaceable natural assets. Conserving forests and natural habitats is not just an environmental priority, but a global imperative that requires cooperation and commitment to ensure the well-being of our planet and future generations (Whig and Sharma, 2023).

## Ecotheology

Ecotheological theology explores the relationship between religion, spirituality and the natural world in a critical and interdisciplinary way. This essay explores the emergence, prominent figures, key perspectives and recent influences of ecotheology.

It also analyses the influence of religious frameworks on the emerging ecological movement (Deane-Drummond, 2017). The term ecology emerged in the 20<sup>th</sup> century as a response to the escalating environmental crisis. Traditional theological frameworks often ignored ecological destruction. Initial contributions came from a number of religious scholars who began to explore the overlap between faith and environmental ethics. Ecological theology thus represented a significant shift in understanding the spiritual dimension of environmental problems: influential figures such as Lynn White Jr, who published his book *The Historical Roots of the Environmental Crisis* in 1967, criticised the Judeo-Christian anthropocentrism that was causing environmental decline. His arguments led to a reassessment of religious teachings about nature (Taylor et al., 2016).

An important aspect of ecotheology is the concept of stewardship. This approach emphasises humanity's responsibility to care for the Earth. It is deeply rooted in the biblical narratives, especially Genesis, where humans are portrayed as stewards of God's creation. This approach fosters a sense of environmental stewardship and sustainable practices in religious communities (Andrianos and Tomren, 2021). For example, many Christian denominations have launched environmental initiatives that embody stewardship principles, such as community gardens and conservation projects (Arbuckle and Konisky, 2015).

Buddhist ecotheology also has important implications for ecological ethics. The core Buddhist teachings, which emphasize interconnectedness and compassion, provide a framework for understanding the importance of environmental protection (Xu, 2020). Buddhist leaders such as the Dalai Lama have discussed the need for global conservation by linking spiritual practice and ecological responsibility (Arora and Reddy, 224). Recent initiatives by Buddhist organizations focusing on mindfulness and sustainable living demonstrate the practical application of these teachings (Bratton, 2018). In Islam, ecology is expressed through the principle of tawheed, which emphasizes the unity of all creation. This perspective encourages Muslims to acknowledge God's presence in nature and promotes a holistic approach to environmentalism (Welch and Rahman, 2024). Renowned scholars such as Seyyed Hossein Nasr have expressed this connection and emphasized the importance of treating nature with respect as part of God's creation (Sayem, 2019). In recent years, various Islamic organizations have engaged in ecological activities, such as tree planting campaigns, which reflect Islam's moral commitment to nature conservation (Wijsen and Anshori, 2023).

Indigenous perspectives further the story of ecotheology and provide additional insights into sustainability. Many indigenous belief systems hold the Earth sacred and emphasise the importance of harmony with nature. These perspectives often challenge dominant Western narratives about nature and property rights (Luetz, 2024). Engaging with indigenous ecological wisdom can lead to a more informed approach

to contemporary environmental issues. Collaborative initiatives such as the recognition of land rights and the incorporation of traditional ecological practices show that the potential for cross-cultural cooperation can support both spirituality and environmentalism (Steffen, 2019). Religiously motivated climate action has emerged in recent years. Faith-based organisations are increasingly vocal about the need to address climate change. Projects such as the US Interfaith Power and Light campaign are mobilising faith-based organisations to take action on climate change. These groups advocate policies against environmental destruction while emphasising moral responsibility (Rigby, 2016). Their efforts are good examples of how an ecotheological approach can give new impetus to social movements.

The future trajectory of ecology will be shaped by persistent global challenges such as climate change, biodiversity loss and social inequalities. Collaborative and interdisciplinary strategies will be essential (Conradie, 2020). The engagement of faith communities with scientific insights on climate change will lend greater urgency to their teachings and actions (Agusalim and Karim, 2024). Furthermore, the integration of ecotheology into broader social movements can emphasize the ethical dimensions of ecological advocacy and strengthen environmental justice (Maksum et al., 2023). In sum, the perspective of ecotheological theology offers a complex and nuanced understanding of the relationship between faith and the environment. By exploring a range of frameworks, including stewardship and indigenous knowledge, the field makes a significant contribution to the sustainability debate. As faith communities become increasingly aware of their role in addressing ecological crises, the capacity for transformative action is critical. The continued development of ecotheology is key to shaping a sensitive and responsible environmental ethic for the future.

### Human ecology

Human ecology studies the complex relationships between humans and their environment. It is an interdisciplinary field that integrates aspects of biology, sociology, anthropology and geography to analyse how human activities affect and are affected by their environment. The discipline aims to shed light on the complex interactions between individuals, their cultural practices, economic systems, technological development and the natural environment. The theoretical framework of human ecology seeks to clarify how human behaviour is shaped by the confluence of social, cultural, economic and environmental influences. It emphasises the interconnectedness of these elements and recognises that changes in one component of a system can have a significant impact on the whole network (Rozzi et al., 2015).

A basic tenet of human ecology is the socio-ecological model, which takes into account the interaction between individual characteristics and the wider social, physical and cultural environment. This perspective emphasises that human behaviour is not shaped by individual choices alone, but by a complex web of

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interrelated factors (Kilanowski, 2017). For example, the phenomenon of urbanisation has transformed human ecological relationships, leading to an increase in population density and changes in resource consumption patterns (Frank et al., 2017). Socio-ecological models provide a framework for researchers to investigate the impact of such transformations on health, well-being and sustainability (Banos-Gonzalez et al., 2018). In addition to the social-ecological model, cultural ecology is another important perspective in this field. This approach argues that human societies adapt to and influence their environment through cultural practices. Julian Steward, a renowned anthropologist, has made a significant contribution to this approach by examining the impact of technological innovation and cultural traditions on the resource management of different communities. Steward's findings shed light on how cultural values and practices can promote sustainability or lead to environmental degradation, highlighting the importance of understanding the cultural context in environmental governance (Bajrami, 2022).

Human ecology has also had a major impact on policy and development. As debates about climate change and resource depletion intensify, human ecology offers a fundamental perspective for aligning human behaviour and social frameworks with sustainable practices (Aarts and Drenthen, 2020). In recent years, there has been a growing number of community initiatives to involve local people in environmental decision-making processes. These approaches reflect the principles of human ecology, recognising the importance of local knowledge and practices for effective environmental governance. Evidence from different regions shows that greater success and sustainable outcomes are achieved when local communities are involved in conservation initiatives (Bennett et al., 2016).

In addition, the field of human ecology is constantly evolving and new disciplines, such as political ecology, are emerging to address global challenges. Political ecology examines the interplay of political, economic and social factors that influence environmental issues and emphasises the importance of understanding power dynamics in ecological debates (Watts, 2017). This perspective is particularly relevant in the current context where environmental justice movements are gaining momentum. These movements seek a fair distribution of environmental benefits and burdens and address inequalities rooted in socio-economic factors. Using the framework of human ecology, practitioners and activists argue for policies that recognise the complex relationship between social justice and environmental sustainability.

Recent technological innovations have opened up new avenues in human ecology research. The emergence of Geographic Information Systems (GIS) and remote sensing technologies has enabled researchers to analyse interactions between humans and the environment on an unprecedented scale. These tools provide data-driven insights into how human activities are changing natural landscapes and how these environmental



changes affect human societies. These technologies can address complex issues related to urban planning, biodiversity conservation and climate change adaptation with cutting-edge research. Integrating these developments into human ecology will improve our understanding of the many challenges to achieving sustainable development (Zhang, 2024).

The discipline of human ecology has great potential for addressing the growing challenges of climate change, resource depletion and social inequalities in the future. As the continuing trend of urbanisation is expected to further increase environmental stress, a human ecology approach will be essential for the development of effective urban sustainability initiatives. Collaborative partnerships between researchers, policymakers and local communities are essential to ensure that different perspectives are taken into account and equitable solutions are developed that promote resilience (Dyball, 2017).

Human ecology provides a fundamental framework for understanding the complex relationships between human activities and environmental systems. Through its historical context, influential personalities and diverse perspectives, it is clear that human ecology can help deepen our understanding of contemporary ecological issues and guide policy-making towards a sustainable future (Szabó, 2015). Continuous research and adaptation within the discipline is essential to address the many challenges.

### **The role of forests in ecotheology**

The role of forests within ecotheology represents an emerging field of research that blends environmental ethics with theological perspectives on the natural world (Conradie, 2023). Forests are vital ecosystems that provide many benefits, including carbon sequestration, habitat for a wide range of species, and resources for human consumption. Ecotheologically, forests symbolise divine creation and the interconnectedness of all life. They are often seen as sacred places where spirituality and the natural environment intersect. The ethical responsibility of individuals and communities to protect these ecosystems reflects a deep theological commitment to stewardship (Simpson, 2022).

From an ecotheological point of view, there is a spiritual reality to be found in nature, which can be discovered through faith. Many religious traditions emphasise the sacredness of creation. For example, Christianity, based on the Book of Genesis, conceives of man as the steward of the earth, the person entrusted by his Creator with the care of the created earth. This view is the basis for theologians who believe that forests, as an integral part of creation, deserve respect and need to be protected from destruction. Likewise, indigenous spiritual traditions often express a deep respect for nature and view forests as sacred entities that provide a link between the divine and the earthly realms, in addition to the forest being their dwelling place (Masoga, 2023).

The historical relationship between humans and forests has often been fraught with conflict throughout history. Exploitation of forest resources has often resulted from a dualistic view that separates humanity from nature. This approach has led to significant deforestation and habitat loss, resulting in various ecological crises. However, the rise of ecotheology has led people to critically reassess these perspectives. Contemporary scientists and theologians argue for a holistic understanding of nature, emphasizing the importance of restoration and conservation efforts that are consistent with spiritual beliefs (Pederick, 2016).

Prominent figures have advocated the integration of ecotheology and environmental ethics. One such figure is Thomas Berry, a cultural historian and ecotheologist, who emphasised the importance of "big work" in moving humanity towards sustainable practices. Berry called for a deep ecological consciousness that recognizes forests as a vital component of a larger cosmic narrative. His insights have encouraged individuals and communities to engage in practices that respect and protect forest ecosystems (Rabiej, 2020). Current ecotheological movements are increasingly focused on the tangible impacts of forest conservation. A number of churches and religious organisations have started to take a proactive stance on environmental protection. Worldwide, initiatives such as tree planting, habitat restoration and advocacy for conservation regulations are emerging. These efforts reflect a collective recognition of the spiritual and ethical dimensions of environmental responsibility. For example, the World Council of Churches has launched programmes to raise awareness and promote action against deforestation and climate change (Tubi, 2021).

The discourse surrounding the relationship between theology and environmental ethics is constantly evolving. Some theologians emphasise the intrinsic value of the natural world, while others focus on the practical benefits that forests bring to human society. The ongoing debate on the concept of nature as a resource or sacred entity remains prominent. Nevertheless, there is a common understanding that ecotheological approaches should promote sustainable practices that recognise the interconnectedness of all living things (Dorner, 2022). Furthermore, forest conservation is closely linked to issues of social justice. Indigenous communities, which often have deep spiritual connections to forests, are disproportionately affected by deforestation and land exploitation. Ecotheology emphasises the need to raise these voices in environmental debates and to stand up for the rights of marginalised groups. This is in line with broader theological movements to address systemic injustices and cultivate a more equitable relationship with the Earth (Messiah, 2024).

The challenges of globalisation and climate change have made the ecological responses to forest management even more urgent. Deforestation has increased in different regions due to activities such as commercial logging, agricultural expansion and urban development. These activities threaten not only biodiversity but also the

cultural and spiritual heritage associated with forest ecosystems. Ecotheology calls for a shift towards regenerative practices that respect the heritage of creation and ensure the conservation of forests for future generations (Vogt, 2020).

The future importance of forests within ecotheology is expected to increase due to the growing environmental problems. There is growing collaboration between theologians and scientists to develop strategies for habitat restoration and increasing ecological resilience. The emergence of innovative technologies and methodologies will facilitate the assessment of ecosystem health and the promotion of sustainable practices. Furthermore, educational initiatives that integrate ecotheology into theological curricula and community engagement are likely to cultivate a new generation of leaders who are also sensitive to environmental issues (Masoga, 2024).

### **The role of forests in human ecology**

Human ecology is an interdisciplinary field of study concerned with the relationships between human societies and their environment. Its research interests include the analysis of the environmental impacts of human populations, economic activities, cultural practices and technological development. The aim is to achieve a sustainable balance between human activities and natural systems to ensure both human well-being and the conservation of natural resources for future generations (Ellis, 2015).

Forests perform a number of essential functions around the world, contributing significantly to the survival of both people and species. Some of these functions are widely recognised, such as the production of oxygen, which is vital for human life, and the absorption of carbon dioxide, which is a major factor in the ongoing climate crisis. In addition, forests provide food and habitat for millions of species, while generating energy and creating jobs for people. Forests play a key role in human ecology as a fundamental factor in the relationship between human societies and nature. The impact of forests is not only in maintaining biodiversity and providing ecosystem services, but also in economic, social and cultural dimensions.

Widespread deforestation is expected to have far-reaching consequences, including reduced resilience (or increased sensitivity) to natural or human-induced disturbances, given the role of biodiversity in providing ecosystem services. As these disturbances appear to be occurring with increasing frequency and intensity (Pachauri et al., 2014; Bockerhoff and Liebhold, 2017; Freer-Smith and Webber, 2017), biodiversity loss is likely to make forests less resilient to invasive species, pests, diseases, and other disturbances (e.g., Jactel et al. 2017), as well as to climatic extremes (Isbell et al., 2015) and to the provision of ecosystem services in general (Vilà and Hulme, 2016). The loss of forest area and forest degradation also reduces the quality and quantity of ecosystem services provided, which in turn leads to a decline in the quality of life for people. To prevent future degradation and begin restoration of

degraded areas, ecosystem conservation needs to be linked to agricultural production and other land uses (Xie et al., 2023). To measure and compare soil degradation within political, cultural, biophysical and management constraints, a standardised methodological framework is needed. The growth of a market economy alone cannot measure the broader development goal of sustainable human well-being (Costanza et al., 2017). To achieve long-term well-being, the interaction of four basic categories of capital goods - natural, social, human and built - is essential for better land and forest management. For example, the relative contribution of natural capital to generating sustainable wealth, when combined with the other three asset categories, is the value of ecosystem services. Despite the focus on natural capital and ecosystem services, it is acknowledged that an integrated, transdisciplinary approach encompassing all four forms of capital and their complex interrelationships is needed to understand, model and value ecosystem services (Hein et al., 2016).

The Maathai Green Belt movement in Kenya highlights the importance of tree planting and reforestation as strategies to alleviate poverty and improve the environment. Such grassroots initiatives provide a powerful example of how ecological sustainability can be aligned with economic development (Njagi, 2022). The green infrastructure of a community is made up of local and national parks, parkways, forests, community gardens and many other types of conserved private and public elements of the natural environment (green spaces) when considered as a whole community. In urban environments, this infrastructure can consist not only of landscape patches and corridors, but also of other natural formations (such as street trees and green roofs) that provide ecosystem services that promote health without taking up much of the limited urban space. "Green infrastructure" is commonly defined as "an interconnected network of green spaces that preserves the values and functions of natural ecosystems and provides associated benefits to human populations".

Forests are of immense cultural importance to many communities, especially indigenous groups who rely on these ecosystems for their livelihoods, spiritual practices and cultural heritage. Traditions derived from forest environments are often intertwined with traditional ecological knowledge, providing critical insights into sustainable management practices (Pert et al., 2015). Indigenous communities have an important role to play in addressing climate change. Their commitment to defend their territorial rights against companies involved in fossil fuel exploration and extraction that have historically polluted their water resources and violated their human rights is consistent with the goals of environmental organizations and some UN member states seeking to reduce greenhouse gas emissions to combat global warming. This scenario offers an opportunity to achieve mutual benefits. By banning oil exploration and exploitation in indigenous territories, it not only preserves the well-being, culture and traditions of indigenous communities, but also supports the conservation of

forests and biodiversity, thus increasing the incentives to seek alternative energy sources (Etchart, 2017).

But forests face many challenges, including climate change, industrial expansion and urban development. The increasing demand for land to accommodate a growing population has led to significant deforestation, exacerbating biodiversity loss and upsetting ecological balances. Addressing these challenges requires national and international cooperation focused on enforcing regulations and promoting sustainable land use practices (Turubanova et al., 2018).

Recent technological developments offer promising opportunities to improve forest management practices. Advances such as remote sensing and geographic information systems have increased the ability to monitor forest conditions and change over time. These technologies enable authorities to identify illegal logging activities and forest degradation by providing resources for rapid intervention. In addition, public engagement through citizen science initiatives promotes community participation in conservation efforts. For example, platforms that allow individuals to report tree mortality or develop inventory databases empower local stakeholders and foster a sense of stewardship for forest resources (Nowak et al., 2018).

As society develops, the role of forests in human ecology is expected to evolve. Climate policies that emphasise afforestation and sustainable land management can transform the relationship between people and forests and increase resilience to environmental change. Global collaborative efforts such as the Bonn Challenge are restoring millions of hectares of deforested and degraded areas worldwide, reflecting a growing recognition of the importance of forest ecosystems (Stanturf et al., 2019). Such international initiatives need to be complemented by local action to ensure long-term sustainability.

## Conclusion

In summary, forests and natural ecosystems are essential for sustaining life on our planet, playing a critical role in maintaining biodiversity, regulating climate patterns and facilitating the hydrological cycle. Their economic impact is significant, including providing resources, promoting ecotourism and valuing ecosystem services. In addition, the social and cultural importance of forests for indigenous peoples, cultural heritage and recreational activities is significant. Historically, forests have been recognised as a resource serving multiple functions or purposes. More recently, this concept of multifunctionality has come to the fore as a new framework for understanding forests, replacing the previously dominant monofunctional, production-oriented perspective that prevailed in many developed countries, particularly in the 20th century. The resurgence of multifunctionality poses new challenges for forest professionals, as the costs and benefits associated with monofunctional forests are relatively easy to identify and quantify. In contrast, the

complexity of multifunctional forests requires consideration of a wider range of values and costs, which complicates the valuation process (Slee, 2005). In addition to the material goods, forests also provide other ecosystem services and therefore need to be considered in valuation. Indigenous communities, on the other hand, are constantly facing significant challenges, particularly with regard to their rights to land, which are threatened by activities such as natural resource extraction, infrastructure development, extensive agricultural practices and conservation efforts. In some cases, the risk of statelessness increases, especially for indigenous groups whose ancestral territories extend beyond national borders (Anaya, 2004).

The intricate links between the ecological, economic and cultural dimensions highlight the urgent need for effective conservation strategies and mitigation policies at all levels, from grassroots initiatives to global agreements, to protect and sustainably manage these invaluable natural resources. Recognition of their multifaceted importance is vital for the development of a global conservation ethos that puts the protection of our environment at the forefront. The role of forests within the fields of ecotheology and human ecology highlights the interconnectedness of ecological, economic and cultural dimensions, reinforcing the need for comprehensive and sustainable forest conservation strategies (Kgatle and Chigorimbo, 2024). The historical, current and future functions of forests in these contexts illustrate the importance of collaborative efforts combining ecological responsibility with theological insights and the evolving field of human ecology. As we move forward, the integration of ecological stewardship with theological frameworks and the ongoing development of human ecology will be crucial in addressing the complex challenges ahead, ensuring that essential resources are available for future generations.

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**Absztrakt.** Az erdők és a természetes ökoszisztémák alapvető fontosságúak a bolygónkon előforduló élet fenntartásához, kritikus szerepet játszanak a biológiai sokféleség fenntartásában, az éghajlati mintázat szabályozásában és a hidrológiai ciklus elősegítésében. Ezeket a kritikus ökoszisztémákat azonban számos veszély fenyegeti, az erdőirtástól kezdve az éghajlatváltozásig, ami a globális, nemzeti és helyi érdekeltek összehangolt erőfeszítéseit igényli megőrzésük biztosítása érdekében. Ez a tanulmány az ökoteológia kialakulását, kiemelkedő alakjait, kulcsfontosságú perspektíváit és legújabb hatásait vizsgálja. Az ökológiai, gazdasági és kulturális dimenziók összekapcsolódása rávilágít arra, hogy e felbecsülhetetlen értékű természeti erőforrások védelme és fenntartható kezelése érdekében minden szinten - az alulról jövő kezdeményezésektől a globális megállapodásokig - sürgősen szükség van hatékony természetvédelmi stratégiákra és mérséklési politikákra. Az erdők történelmi, jelenlegi és jövőbeli funkciói ezekben az összefüggésekben jól szemléltetik az ökológiai felelősséget a teológiai meglátásokkal és a humánökológia fejlődő területével ötvöző közös erőfeszítések fontosságát.

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