The Impact of Shrinking Green Spaces on Mental Health: A Scoping Review Across High- and Low-Income Countries

Verena Atud Achick-Muyu

Wolfson Institute of Population Health, Queen Mary University of London, London, UK

DOI: https://doi.org/10.51584/IJRIAS.2025.100800056

Received: 31 July 2025; Accepted: 05 August 2025; Published: 08 September 2025

ABSTRACT

Green spaces are increasingly recognized for their significant contributions to mental health and psychological well-being. While existing literature primarily emphasizes the environmental and ecological functions of green areas, there is a growing body of evidence highlighting their relevance to public health. Despite this, urban and forested green spaces continue to decline due to anthropogenic pressures and insufficient policy implementation. This scoping review investigates the effects of shrinking green spaces on mental health outcomes in both high- and low-income countries. A systematic literature search was conducted using PubMed, Elsevier, and MDPI databases, supplemented by relevant bibliographic references. Studies were selected based on predefined eligibility criteria and evaluated through a structured data charting process. Thematic analytic induction was employed to analyse and synthesize findings into key themes. Thirty peer-reviewed studies met the inclusion criteria, encompassing a range of methodologies. The findings demonstrate a consistent association between green space reduction and adverse mental health outcomes. Notably, the review identifies critical contributing factors to green space loss, including weak policy frameworks, unregulated urbanization, and socio-environmental inequalities. These determinants underscore the urgency of developing integrated strategies that preserve and expand green infrastructure. This review reinforces the premise that diminishing access to green environments constitutes a substantial risk factor for declining mental well-being. Addressing this issue requires a multidisciplinary approach that incorporates inclusive urban planning, equitable policy development, and community-driven environmental stewardship. Ultimately, safeguarding green spaces may serve as a viable intervention to mitigate mental health disparities and promote sustainable development in both urban and rural settings.

Keywords Green spaces, mental health, environmental policy, urban planning, public health, scoping review, sustainable development

INTRODUCTION

Green space, an element of nature, and humans have had a mutual relationship for centuries [1], affecting each other negatively and positively. On the one hand, human activities in green spaces influence the conservation or loss of green spaces. On the other hand, human green spaces affect various aspects of human health. There is an enormous body of evidence suggesting that forest loss [2, 3] and shrinking green spaces cause changes in the environment, like climate change, affect the ecosystem through biodiversity loss, and have physical health consequences [4, 5]. Yet, there is a sketchy amount of evidence showing the impact of these phenomena on human mental health [6]. Scholars who have reported positive impacts of green spaces on human mental health [7-9] imply that losing green spaces may take a toll on mental health. Mental health disorders are one of the public health concerns that have multiple causes, with environmental consequences being a causative factor. In this study, we will investigate the effects of Urban green space shrinkage and forest loss on human mental health [10].

Green spaces, including forests, street trees, and gardens, are crucial in urban and non-urban areas [11, 12]. They enhance the environment, improve climate conditions, and promote physical and mental health. However, these areas are gradually diminishing due to forest loss, clearing, or degradation [13-15], a trend attributed to

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

anthropogenic and socio-political factors [16]. This study focuses on the impact of this shrinkage on human mental health, a topic of increasing importance in our urbanized world.

While there are several forms of green spaces, each offering its unique significance to humanity [17, 18], forests and urban green spaces were chosen for this study because of their importance to human health. Forests alone make up to 33% of the total land surface [19, 20], which gives forests the leverage to impact human well-being. Urban areas make up only 2% of the total land surface. Still, urban areas are home to about half of the world's population [21-23], making green spaces within urban areas a significant topic of discussion [24-26]. For this research and to ease understanding, I will use the term "green spaces" interchangeably as an inclusion of forests and urban green spaces.

In this study, we particularly seek to answer these research questions.

1. What are the causes of forest loss and shrinking urban green spaces?
2. How does the conservation and loss of green spaces affect mental health?
3. What are the specific mental health outcomes associated with conserving and losing green spaces?
4. Using the Human-Forest Theoretical Reference, how can existing policies that target the mitigation of shrinking green spaces be refined to enhance mental health outcomes?

To address these research questions, the following goals and objectives will guide the investigation.

1. Examine the literature on mental health outcomes that show the positive effects of conservation and the negative effects of the loss of green spaces.
2. Review relevant literature on green space benefits and limitations to accessing green spaces.
3. Examine the geographical distribution of studies across the globe and highlight how socio-economic, environmental, political, and cultural differences influence patterns of shrinking green spaces and how these differences relate to the mental health of affected communities.
4. Evaluate the effectiveness of current policies to mitigate the loss of green spaces.

To answer these questions, we carried out a scoping review to analyse the existing literature comprehensively and systematically, identify potential gaps, and gather policy recommendations. A scoping review is a knowledge synthesis type introduced by Arksey and O'Malley in 2005 [27]. We chose this study because it is suitable for reviewing a lot of literature and mapping out and clarifying key concepts, which is in line with what this study seeks to achieve. Additionally, a scoping review is suitable because this study's evidence is emergent and unclear. While the analysis is not limited to specific research designs, it is heterogeneous; the scoping itself is a qualitative study design because it relies on people's viewpoints [27, 28].

LITERATURE REVIEW

Researchers have welcomed various perspectives in examining the interaction between people and green spaces. Using the political-ecology paradigm, some academics have examined how state policies affect people's access to resources, such as forest resources, how it also affects their land use rights, and how carried out policies cause environmental disputes [29, 30]. From social perspectives, several academics have examined this link between woods and people. Furthermore, some have used the Environmental Justice Framework [31] as a prism through which to view the interaction between forests and people with emphasis on disparities in the distribution of forest resources and bearing the load of environmental catastrophe [31-33].

Beyond the biophysical, other researchers have examined the reasons and effects of mental health. They have also used the concepts of Social-ecology, political ecology, and environmental justice to explore their impact on mental health results. In mental health, social ecology systems can provide insights as to how the built environment, community dynamics, and social interaction impact an individual's mental well-being inside green spaces. Looking at mental health results through the prism of the policy ecology framework reveals how power choices and policy executions affect mental health. The Environmental justice approach also underlines the unequal load on underprivileged communities, including disparities in access to green areas and even mental

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

health care, hence aggravating mental health issues.

2.1 Conceptual Framework

The Social ecological system also known as the Social-ecological Systems Framework is defined as "A well-functioning system of physical and social factors working together in a resilient and sustained way" [34, 35]. The socio-ecological system was initiated by Ostrom [34] and has undergone critique and input from other scholars; however, its holistic approach to human interaction with ecosystems made it valuable for this study. 'The tragedy of the commons' challenged Ostrom. The tragedy of the commons is a situation where individuals act independently but in a manner that depletes limited shared resources. Ostrom was challenged by this and argued that humans could have regulations on the sustainable management of shared resources [34]. From this light, The Social ecology framework can be used in this study to inform policy on the sustainable management of green spaces (which are limited resources) and prevent their vast shrinkage. It has been used in studies like Boateng and Machal, who looked at Ghana's socio-ecological causes of deforestation.

The Policy Ecology Framework, established by Raghavan in 2008 [36] is a model that helps to understand how policies are created and implemented. The framework portrays how the federal, state, and local policies can work together to implement policies. The framework emphasizes the reciprocal relationship between policy and ecology, recognizing that ecological conditions shape environmental policies and, in turn, environmental policies influence ecological conditions. This means that policies affect how people live within their environments, and people's way of living should influence how policies are made. By understanding this system, we can better analyze and influence policy-making processes. Raghavan highlights four key dimensions within the policy ecology framework: actors, institutions, discourse, and ideas. A study in Philadelphia by Powell [37] used this framework to understand the application of Evidence-Based Practice in mental health settings. The researchers highlighted alternative mental health practices and how they can be adopted within mental healthcare settings. Using this framework in my study, I will examine how policy has considered curbing the loss of green spaces, understanding if the trends in green space loss have influenced their decision in policy implementation.

Finally, Environmental Justice is a framework that aims to ensure the fair distribution of environmental benefits and burdens. This framework was brought to the limelight in the late 1970s by Dr. Robert Bullard, who exposed the environmental injustices of inappropriate waste disposal suffered by people of colour in Texas. The framework emphasizes the role of political institutions, economic interests, cultural values, and historical contexts in shaping land use patterns to reduce exploitation and improve environmental governance. Adopting this framework in this study will be used to examine the impact of shrinking green spaces on marginalized communities and examine fairness, social participation, and rights in environmental decision-making. It sheds light on the disparities that exist in accessing resources across various communities. Environmental justice also emphasizes the need to rectify environmental injustice and promote community empowerment through inclusive, transparent, and responsive policies and practices.

2.2 The causal relation between green spaces and human mental health

As a lens through which to view this study, we have combined parts of the policy-ecology framework, the Environmental Justice Framework, and the social ecology system to create what we call the Human-Forest Theoretical Reference. The Human-Forest Theoretical Reference is a holistic approach that analyses the complex relationship between human societies and forest ecosystems. It summarizes that four main factors could impact forest and urban green space loss. These same factors can be used properly to avert the loss of green passes. The Human-Forest Theoretical Reference also highlights that there is an impact on mental health when these factors come into play between humans and the environment [38]. It examines the overarching influence of social status, ecosystem resilience, political dynamics, and environmental justice on deforestation drivers and management practices. The Human-Forest Theoretical Reference aims to promote equitable forest and green space resources by addressing social inequalities and promoting policies that foster the conservation of green spaces.

To complement the Human-Forest Theoretical Reference, Figure 1 shows several key reasons for the loss of green space caused by people and the consequences of this situation on their general health. This graphic of the Human-Forest Theoretical Reference shows that people and trees are related.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

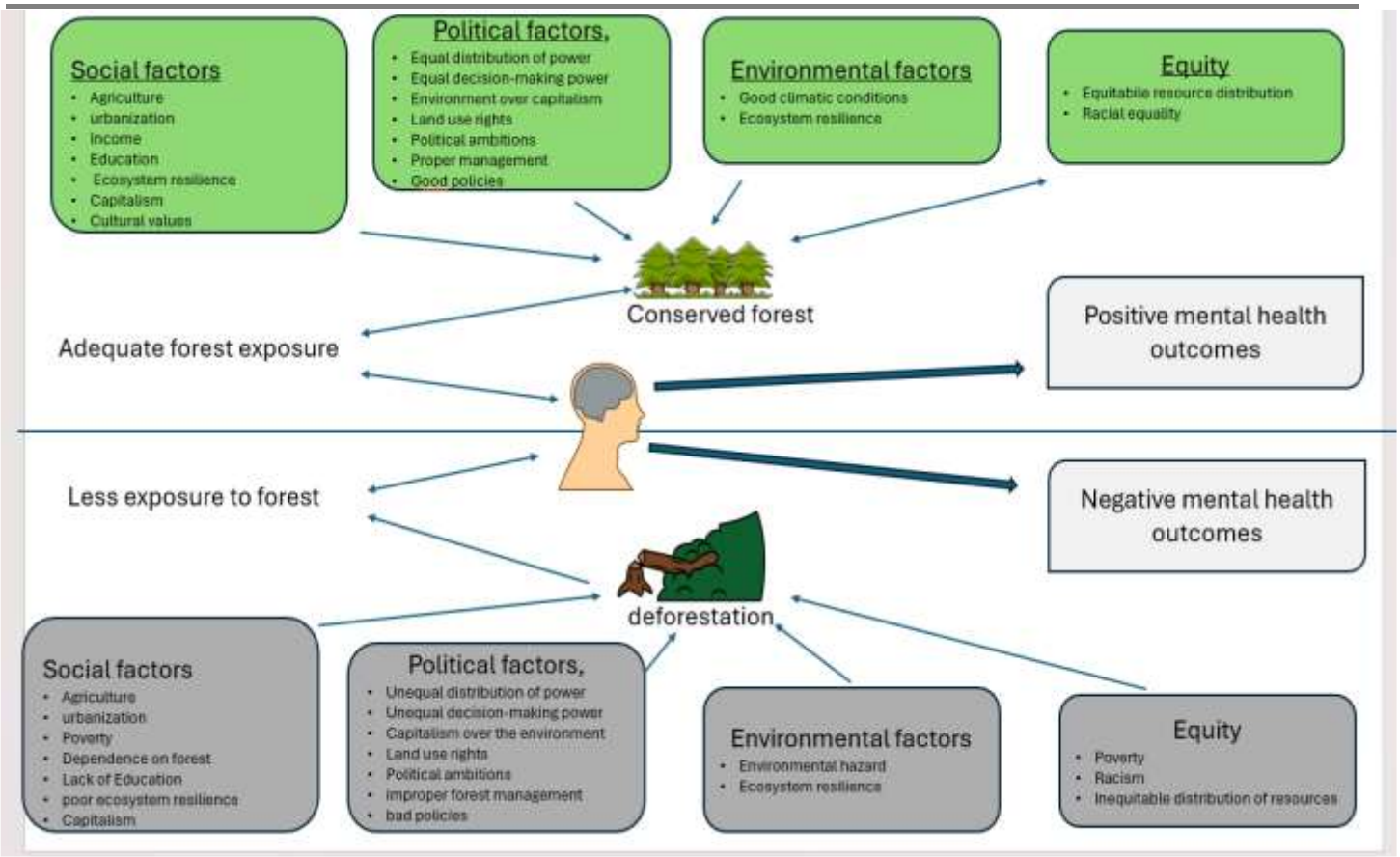

Figure 1: The Causal relationship between green spaces and human mental health

This causal relationship between green spaces and mental displays a line that separates the diagram into two spheres. On the one hand, the upper portion of the diagram shows how four (4) factors (social, political, environmental, and equity) summarized from the social-ecological system, policy ecology, and environmental justice act to support green space conservation. Additionally, it demonstrates how the conservation of green spaces caused by these variables could increase the chances of accessibility, which can create positive mental health outcomes.

On the other hand, the lower sphere shows how these variables can take an anthropocentric approach and cause negative environmental consequences, leading to the loss of green spaces. This, in turn, reduces access to green spaces, which has been linked with poor mental health outcomes. Our research aims to bring attention to the communities that rely on forests as their sanctuary. Through my work, we strive to promote the preservation of green spaces and contribute to the global conservation of forests and sustainable forest management practices.

The summary of the literature synthesized in this Scoping review is found in Table 1.

Table1: Summary of the studies used for the Scoping Review

	Reference	Methodology	Mental health outcome	Green space type	Mian points and cause of loss	Region
1	Furuyashiki et al.,[39]	Comparative study	decrease depressive tendencies	Forest	Access to green spaces	Japan
2	Nghiem et al, [40]	experimental field research 20 mins walk in primary or secondary forest	Restorative effects and improve mood	different forest types	x	Singapore

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

3	Kim et al., [41]	experiment of 90 mins forest activity test and no activity in control	positive emotions for the test group	urban forest	x	Malaysia
4	Gascon et al., [42]	systematic review	reduced depression, reduced stress and axiety and improved mood	different forest types	Urbanisation	global
5	Bratman et al [43]	RCT, 75 mins walk in forest	reduced rumination, reduces anxiety and depression	Urban forests	Accessibility to green spaces	USA
6	Nawrath et al., [13]	scoping review	reduced stress and improved mental health symptoms	various tpyes	urbanisation, culture, social amenities	global
7	Simkin et al., [44]	field experiment	increase perceived restoration	old gowth forest and urban park	accessibility to green spaces	Finland
8	Hassan et al., [45]	forest walk , Test and control experiment by random selection	decrease anxiety	bamboo forest and urban setting	accessibility to green spaces	China
9	Markevych et al., [46]	cross sectional	decrease stress, decrease anxiety, decreased depression and improved mood	Urban forest	Built neighborhood, social cohesion and SES	Global
10	Reid et al., [47]	cross sectional	reduced stress, reduced anxiety and reduced depression	Urban forest	Access to Healthcare, SES, neighbourhood characteristics	USA
11	Park et al., [48]	Field experiment 20 min forest walking	reduces anxiety and systolic BP	Forest	accessibility to green spaces	China
12	Zeng et al., [49]	experimental study 3 days bamboo walk	decrease BP and anxiety	Bamboo forest	accessibility to green spaces	China
13	Clark et al., [50]	Scoping review	reduced negartive affect, increase positive affcets	various tpyes	accessibility to green spaces	Global
14	Bratman et al., [51]	comprehensive systematic review	improved mood, reduce stress, enhanced cognitive function	urban forest	Availability of green spaces	Global
15	Vaughan et al., [52]	quasi-experimental study	improvement of wellbeing, decrease stress, decrease depression and decrease anxiety	urban park	access, inequalities, neighbourhood characteristics, SES	USA

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

METHODOLOGY

3.1 Research Design

This study uses a qualitative research design to conduct a scoping review. A Scoping review is a type of literature review that allows for a comprehensive overview of the existing literature on the topic [53]. The scoping review methodology was first introduced in 2005 by Arkey and O'Malley; while it lacked a definitive framework, it was revised In 2010 by Levac *et al.* [53] and has since become widely used in different fields. In this study, the scoping review methodology was adopted because it allows for the inclusion of a wide range of study designs and data sources, and the mapping of literature. By mapping literature, key concepts and gaps can be identified on this topic of shrinking green spaces and their effects on mental health, which is the focus of this research. This review uses qualitative study, which is a design used to explore and understand the experiences of individuals in relation to shrinking green spaces and their effects on mental health. In this study, a review of different studies will be done to understand human beliefs, behaviours, and attitudes.

3.2 Data Collection

To ensure a comprehensive synthesis of the literature, a systemic and inclusive search of key databases in the fields of environmental psychology, public health, and forestry was carried out. Three (3) main databases were searched, PubMed, Elsevier, and Taylor and Francis, shedding light on the relationship between green spaces and mental health outcomes. Additional material was obtained from four study bibliographies. During the search process, Boolean operators like "AND" and "OR" were not used because they would narrow down the search, and because a scoping review supports obtaining a vast array of data and ensuring inclusivity, only keywords and eligibility criteria were necessary. The keywords used during the search were Forest, deforestation, forest bathing, forest degradation, green spaces, urban forest, rainforest, mental health, urban green spaces, natural environment, and solastalgia. From the three databases PubMed, Elsevier, and Taylor and Francis Online, 1187 studies matched the keywords identified: 457, 612, and 118, respectively.

Only n=42 studies were selected from PubMed, n=28 from Elsevier, and n=10 from Taylor and Francis, making a total of n=80 studies. The excluded n=1108 studies were due to redundancy in the content. Of the n=80 studies, n=58 studies were excluded after reading through the Abstract and finding out they missed checking the eligibility criteria, leaving n=22 studies finally selected from the three databases. Additionally, because the search did not yield results in Africa and South America, the quest to meet the geographical inclusion resulted in further search through some studies' bibliographies. This led to the selection of n=8 studies from three publishers (MDPI, The Lancet, and PLOS) to make a total of 30 Studies selected. The study selection process is described in a flow chart that been customized. This is shown in Figure 2.

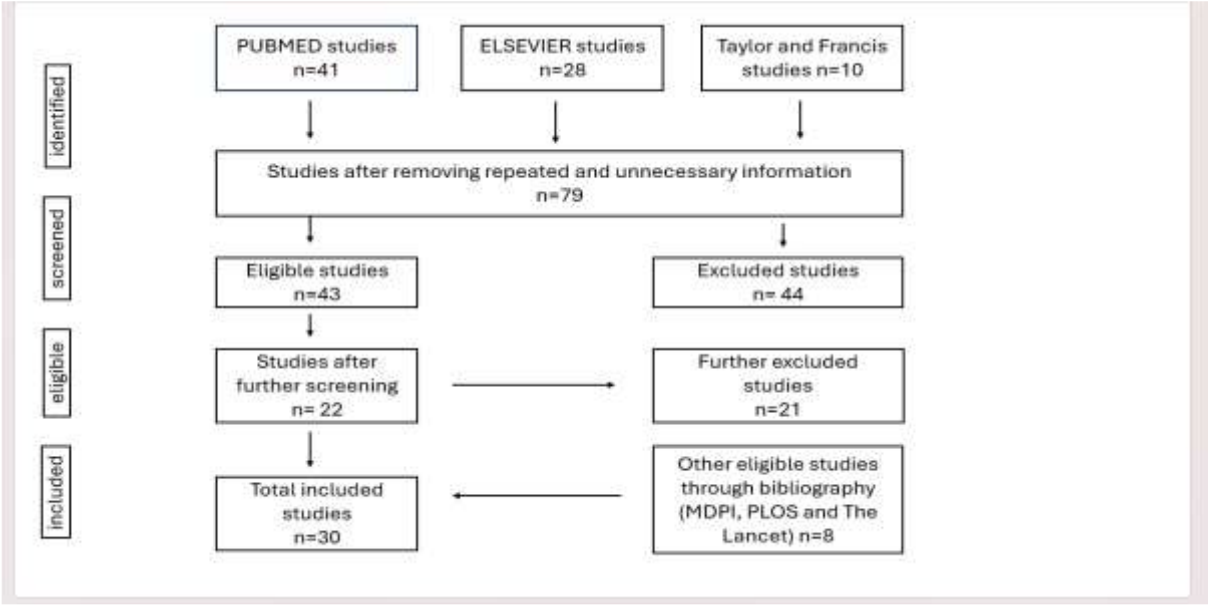

Figure 2: Flow chart for the study selection process

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

Table 2: Criteria for eligibility and exclusion of data

Inclusion criteria	Exclusion criteria
All studies were conducted in the English language	Studies that were not fully accessed.
Studies were done in North America, South America, Asia, Africa, Australia and Europe	Studies done in Antarctica
Studies that were conducted between 2009 and 2024	Studies that only related deforestation to environmental challenges and not mental health
Peer-reviewed Studies were selected	Unethical studies and studies that included children and anybody who cannot give legal consent.
Any study design and methodology that was related to the research aim	

3.3 Data Analysis

The Arksey and O'Malley scoping review lacks a structure for reporting findings; therefore, I will use a thematic approach. Data analysis will be done by extracting data traditionally using a traditional data charting form. Then, I will use themes to present the data. This process is also known as Thematic analytical induction. The identified themes will be interpreted in relation to the study aims and objectives while drawing on theoretical frameworks used in the study. This method of analysing data suggests that themes are derived from reading through the literature. These themes could be common words found in the data that explain the same processes or ideas.

Finally, the findings will be presented in a narrative format that highlights how these key themes answer the study questions. Popularized in the 1970s, thematic analytical induction is a method of analysing and interpreting qualitative data and large amounts of literature, as is the case of this study. It offers an approach that insists on rigor, transparency, and reflexivity, providing validity to the themes. The thematic analytic induction in this study would provide synthesized and related knowledge that answers the specific research questions.

3.4 Ensuring the validity and reliability of data

A scoping review typically does not assess the quality of evidence because the main objective is to provide an overview, not details. However, peer-review studies were selected mainly to ensure their validity and robustness. Peer-reviewed articles are published in reputable databases that consider the rigor of the study designs [11]. However, peer studies may not guarantee flawless research; therefore, the selected studies were critically evaluated for content. The literature was peer-reviewed, and the study supervisor proofread the themes derived to ascertain that they were relevant to the study. Finally, to ensure the validity of the identified themes for this study, the themes derived in this study were compared with themes derived from other qualitative studies similar to this research topic and aims.

RESULT AND DISCUSSION

This chapter will look into the determinants of green space shrinkage and the barriers to accessing green spaces.

4.1. Causal relationship of Humans and Green spaces

This chapter provides a broad overview of synthesized information that has been structured to answer the research question, "What causes the shrinking of green spaces?" The causal relationship is represented in a diagram (see Figure 1 above). The drivers of green space loss are multifaceted and represent a complex interplay of socioeconomic, institutional, and environmental factors (see Figure 1 above). Understanding these driving factors is essential for developing effective strategies to mitigate the widespread loss of forested areas and its negative impact on mental health. The causes of green space shrinkage will be viewed from the theories used in

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

this research to create an overarching reference.

Socio-economic conditions impact forest loss. From the study, rapid urban growth has been reported as one of the primary causes of forest loss and urban green spaces [10, 54]. The transformation of green spaces within cities and rural areas into infrastructure has been done due to increased housing demand to accommodate the growing population. Additionally, Land transformation for agriculture is another known cause of primary forest loss in the Amazon Basin and Congo Basin, where poverty and increased dependence on forest are seen. Lack of education and unawareness of green space values among marginalized communities and some communities that depend on forest resources can lead to unsustainable forest practices. Extreme weather and capitalism over the environment, like the creation of solar parks for trending renewable energy, can convert forests into built environments, leading to forest loss. Political factors can also contribute to the loss of green spaces. Conflicts, land disputes, and geopolitical tension can lead to the physical destruction of green spaces, neglect, displacement, and abandonment of forests. Some political leaders may promote forest use due to their political ambitions.

In South Africa and Brazil, for example, corruption, lack of control and access to protected land for agriculture, and illegal logging are some of the reasons for massive forest loss. Looking at these social and political factors from the lens of the socio-political framework [37], these limited green spaces, which have been over-exploited, can lead to permanent losses because they are limited planetary resources [21]. The lack of control of resources through unsustainable practices like illegal logging can lead to the tragedy of the commons [18], which is what the socio-political framework seeks to avert. From a political-ecology framework lens, in Brazil's case, organizational bodies like the federal government have not considered implementing policies that favor the environment.

4.2. Barriers to the accessibility of green spaces

The mere presence of green spaces improves overall health; however, accessibility is key. In this study, accessibility is the ease with which people reach and use green spaces. It may be measured in terms of proximity and the readiness of residents to visit these spaces [53]. Bridging these barriers would increase the accessibility of green spaces. Urbanization is a problem for high-income and low-income countries. Its consequences lead to the rapid increase of slums, especially in lower-income countries. Marginalized communities in high- and low-income countries have decreased access to urban green spaces due to decreased available green spaces, decreased amenities, and deteriorated and degraded urban green spaces like parks.

The most recent pandemic revealed once again such disparities, such as city dwellers who depend on public green spaces not being able to access these spaces due to the lockdown policies. Meanwhile, more affluent neighbourhoods with stand-alone houses and private green spaces had access to their green spaces. These disparities perpetuate health and well-being gaps as those with limited means face challenges in accessing the mental health benefits urban green spaces offer. Other factors that impose barriers to accessing green spaces include Urban policy and planning. Poor policies exacerbate inequalities. Thoughtful planning can ensure equitable distribution, fostering a more inclusive environment. Other factors that hinder access to green spaces include a lack of knowledge on the benefits of urban green spaces, the proximity of urban green spaces to residential areas a safe and secure neighbourhood, and physical and mental impairment. Poor policies also lead to uncontrolled use of public goods (like green spaces) with no consequences [55]. Inequality is another factor derived from the Socio-political system, environmental justice Framework, and policy-ecology framework, which argue that resources are not equally distributed. Poorer neighborhoods have less access to green spaces because they are less available or degraded.

4.3 Analyses of the effects of green spaces on mental health outcomes as conducted by the study

This chapter analyzes literature and provides a knowledge base showcasing the connection between green spaces and mental health. It provides the positive and negative effects of this relationship, thereby answering the research question, “What are the mental health outcomes associated with the conservation and the shrinking of Green spaces.”. This section will accentuate the extent to which mental health disorders are a burden for individuals, their families, and society, and I will briefly enumerate other effects of green spaces on humans, I will highlight briefly how mental health is seen as a burden for people and the society.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

4.3.1 Positive mental health outcomes with conserved green spaces

Some argue that losing green spaces, especially forests for human benefits and consumption increases revenue, reduces disease-causing vectors, and promotes social contacts by fostering civilization within rural populations. I argue that such arguments are shortsighted and dismiss the very important benefits that green spaces offer humans.

4.3.1.1 Calming effects of green spaces

Green spaces are great places for outdoor activities like hiking, cycling, and camping. The psychological benefits of available and accessible forests are seen in their calming effects. Exposure to a forest environment to experience nature was popularized in Japan and referred to as “Forest bathing”. This effect was studied in a forest environment in Japan often referred to as "forest therapy" or "shinrin-yoku," Forest bathing is the act of immersing oneself in the forest environment and using all senses to communicate with nature. This phenomenon has been widely accepted, especially across Asia. Another accepted reason for the calming effects of the forest is that the rustling of leaves and certain tree chemicals that are emitted have a calming effect. Likewise, Urban residents use public green spaces like parks as a getaway from busy city life [56]. Studies have found that exposure to green spaces can have a calming effect on the mind and body. Exposure to green spaces has given rise to self-reported or subjective mental health outcomes and tested outcomes. Subjective mental health outcomes are the views of participants. Some scholars, however, may consider them non-reliable and short-lived. Subjective positive outcomes reported in the body of evidence are outcomes like increased feelings of happiness, improved mood and increased feelings of self-worth. Furthermore, a restorative function, which is the feeling of being revived after exposure to green spaces, was also reported. Improved cognitive function and increased concentration are also indicative of positive mental health outcomes caused by increased exposure to green spaces. Other studies found that some participants who were exposed to green spaces reported significant reductions in negative mental health outcomes like reduced anxiety and decreased depression and reduced perceived stress levels psychological distress. Finally, using experimental studies, physiological measurements such as Blood pressure indicate that exposure to green spaces can reduce systolic blood pressure which in turn calms a person by reducing anxiety.

4.3.1.2 Social cohesion and improved mental health outcomes

From this study, social cohesion is a mediator for mental health. The study also suggests that living near green spaces is associated with higher levels of social cohesion which is defined as the degree to which people in a community trust and support one another. Social cohesion has been linked to various positive outcomes, including improved mental health. For example, evidence from the study found that residents of a neighbourhood with large and closer parks had higher levels of social cohesion and lower levels of depression and anxiety compared to residents of a neighbourhood without a park. Access to green spaces can also promote social interaction and community engagement, which can have a positive impact on mental health outcomes indirectly. Forested areas, especially in urban settlements, provide a platform for social engagement, which decreases psychological depression. Community engagement in green spaces acts as a buffer against mental health challenges, providing a sense of belonging and support. These findings suggest that access to green spaces can promote social cohesion, which in turn can positively impact mental health outcomes.

4.3.1.3 Ecosystem benefits of green spaces and impact of their loss

An ecosystem is a dynamic community of living organisms interacting with each other within a defined geographical area. Preserving biodiversity is important for maintaining a healthy ecosystem and diverse plants and animal species, increasing food sources, supporting a healthy gut microbiome, and improving brain health. Losing green spaces will imply a loss of biodiversity and increase the chances of gut-brain disorder.

4.3.1.4 Environmental benefits of green spaces

Forests capture carbon, improve air quality, store water, and improve water quality. Forests are the greatest storage for carbon. They also prevent soil erosion and floods by their ability to hold soil particles together. Green

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

spaces like forests can reduce atmospheric temperatures and ambient temperatures (the temperature directly on the earth's surface) by providing shade and reducing sun rays that reach the earth. The process of transpiration, where plants release water into the atmosphere, helps to reduce temperatures. Maintaining ambient temperature contributes to climate regulation, and an increase in ambient temperature is linked to psychological stress and increased suicide rates.

4.4 Mental health disorders as a burden for individuals, families, and society

Mental health illness is a serious public health concern that needs urgent attention. About 1 billion people around the world suffer from mental health disorders. Mental health disorders range from mild depressive symptoms to severe schizophrenia and are a burden to individuals, their families, and society through increased dependence, increased healthcare spending, decreased quality of life, and decreased in productivity. Mental health outcomes are influenced by a multitude of factors that are often complex and interrelated. Economic conditions, for instance, can affect individuals' access to healthcare, education, and employment opportunities, all of which can impact their mental well-being. Similarly, cultural values and attitudes towards mental health can shape how individuals perceive and seek help for mental health issues. Additionally, conflicts, whether they be interpersonal or societal, can have a profound effect on mental health outcomes, leading to stress, trauma, and other psychological challenges. Therefore, it is important to consider various factors that contribute to mental health outcomes to develop effective strategies to support individuals and promote mental wellness. This further exacerbates mental health problems. For this reason, scholars have suggested that other effective and cheaper means of promoting mental health can be helpful for these poorer communities, and one of these methods is to preserve green spaces in the world. Using green spaces could help reduce this cost by 17.5%.

4.5. Negative mental health outcomes of shrinking green spaces

4.5.1 Urbanisation as an environmental stressor

According to this study, urban living is said has a negative impact on mental health, because urbanization exposes individuals to urban stressors like noise pollution, air pollution, and increased heat, also known as the *heat island effect* and increased particulate matter that worsens well-being. Urbanization, which is caused by deforestation (the loss of forests), presents a complex array of environmental stressors that can significantly affect the health and well-being of urban populations. One prominent issue is the proliferation of slums in rapidly urbanizing areas characterized by overcrowded and unsanitary living conditions.

Slums often lack basic infrastructure such as access to clean water, sanitation facilities, and adequate housing, contributing to poor health outcomes and increasing stress among residents. Additionally, urban areas are plagued with levels of noise pollution from traffic, construction, and industrial activities and densely populated living spaces.

Prolonged exposure to excessive noise is linked to various health issues, including sleep disturbances, hypertension, and impaired cognitive function, further heightening stress among urban dwellers [57]. In cities, the phenomenon of urban heat islands causes temperatures to rise to levels higher than in their surrounding rural areas. The increased temperatures, in turn, lead to heat-related illnesses, including heat stroke, dehydration, and heat exhaustion. Moreover, high temperatures can also increase stress levels, affecting mental health and overall well-being. The urban heat island effect is primarily caused by the dense concentration of buildings, roads, and other infrastructure that absorb and trap heat and the lack of green spaces that could otherwise help regulate temperatures. Despite being surrounded by a dense population, living alone in urban cities is becoming increasingly common due to rapid growth and limited space for bigger houses.

4.5.2 Solastalgia

Solastalgia is a term that refers to the emotional and psychological distress caused by environmental change or degradation. It is similar to homesickness or nostalgia for a place that still exists but has been altered or destroyed in some way. In this study, indigenous populations, such as the Baka in the Congo Basin and the Batwa in Kenya, have reported experiencing separation anxiety after being forcefully evicted from the forest areas they call home.

ISSN No. 2454-6194 | DOI: 10.51584/IJRIAS |Volume X Issue VIII August 2025

Indigenous people live within forest spaces and rely on them for shelter and food. The forest holds immense cultural significance for indigenous people who practice traditional methods of forest management that are inherently sustainable.

4.6 The Geographical significance of green space shrinkage and mental health

It's important to note that over 93% of the studies used for this review were conducted in high-income countries. These studies concluded that the loss of forest and urban green spaces affects mental health outcomes. Two studies from sub-Saharan Africa also showed that the loss of indigenous forests impacts mental health, and urban green spaces. When primary undisturbed forests are lost, it significantly impacts climate and biodiversity, contributing to the climate crisis and loss of biodiversity. The loss of these forests also affects the mental health of local tribes who rely on them for their livelihood and identity. Deforestation and shrinking green spaces are happening at higher rates in lower-income countries due to increased poverty, dependence on forest resources, poor policies, high rates of corruption, and increased urbanization. However, more research is needed to understand the impact of green space shrinkage on mental health in low and middle-income countries, both in urban and non-urban areas, as only a few studies have been conducted on this topic.

POLICY REVIEW, FUTURE RESEARCH, AND POLICY RECOMMENDATIONS

5.1 Review of existing policies to mitigate green space shrinkage

Various international and national institutions have recognized the importance of preserving forests and green spaces. To this end, they have implemented policies to safeguard primary forests and increase green spaces in urban areas, among many. The United Nations (UN) is a significant organization supporting global afforestation. The United Nations has established several arms of its organization dedicated to environmental conservation, including the Food and Agriculture Organization and the United Nations REDD+ initiative. The UN REDD+ (Reducing Emissions from Deforestation and Forest Degradation) convention is a collaborative initiative of 65 member states to combat the devastating effects of deforestation on the environment and reduce carbon emissions. The convention seeks to protect forests and promote sustainable land use practices to mitigate climate change. Additionally, the United Nations Climate Change Convention (COP) also plays a key role in reducing carbon emissions, which indirectly addresses deforestation. These international efforts are crucial in protecting our planet's natural resources and ensuring a sustainable future for generations to come. The UN's Sustainable Development Goals (SDGs), established to promote sustainable practices, include goal number 15, which focuses on sustainable forest management, halting deforestation, and increasing forested areas through tree planting.

5.2 Policy recommendations

After conducting a comprehensive literature review, I came up with findings that shed light on the topic of shrinking green spaces and mental health outcomes. These recommendations are unique because, unlike other scoping reviews that assess how deforestation affects overall health. This study highlights the grassroots causes of shrinking green spaces and remarks that without policies that are inclusive, sustainable, and monitored for effectiveness, the interaction between man and the forest may soon lead to the tragedy of commons. Despite efforts to curb deforestation through policy, the persistence of the loss of green spaces highlights the need for a comprehensive reassessment and redesign of strategies to address the root causes of systemic failures that have hindered the progress in conservation efforts and access to green space areas. This could be done by addressing grassroot poverty and dependence on forest resources, the lack of policies that promote the conservation of green spaces through sustainable and inclusive urban cities (SGD 11). The study conducted underscores the profound impact of forest therapy in alleviating stress and anxiety (cite), a finding exemplified by Germany’s encouragement of nature therapy by some primary care providers. (Joshcko). This initiative approach highlights the potential benefits of nature-based interventions and serves as a model for other healthcare systems globally. Evidence showed that nature-based therapy has preventive and con restorative functions for persons with already mild mental health issues like depressive disorder. The establishment of Mental health facilities with adequate green spaces may, to an extent, restore function to mentally affected persons in combination with other therapeutic measures. However, before any widespread adoption can occur, raising awareness about these green

spaces' therapeutic benefits is crucial. Although green spaces are available, several factors discourage people from connecting with nature. Therefore, creating awareness about the benefits of incorporating green spaces into daily life is important.

RECOMMENDATIONS FOR FUTURE RESEARCH

The Amazon rainforest in Brazil is one of the densest rainforests in the world, but unfortunately, it also has the highest global deforestation rate. This means that its contribution to global deforestation has far-reaching implications. However, none of the literature selected for the study provided information on the mental health implications of losing the Amazon rainforest. It is important to consider equity in resource distribution in order to understand the increased disadvantage faced by indigenous communities who continue to lose their land. Further research is recommended to explore the relationship between shrinking green spaces and mental health in urban communities and among rural and indigenous populations.

CONCLUSION

The results of this study are consistent with the established theoretical framework. This perspective suggests that factors such as unregulated human activities, inadequate policies, uneven distribution of resources, and environmental issues can lead to the loss of green spaces. At the same time, these factors when reversed, have the potential to reverse the trend of shrinking green spaces. Research has also indicated that the decrease in green spaces is a significant environmental factor that negatively impacts mental health. Therefore, policies that govern urban and non-urban areas should prioritize including and maintaining green spaces in communities. Finally, policymakers should adopt a comprehensive approach that addresses various determinants of mental health, including social inequalities, effective policies, and community support. This approach will help develop more effective strategies to promote mental well-being.

REFERENCES

1. Ulrich, R.S., Visual landscapes and psychological well-being. Landscape research, 1979. **4**(1): p. 17-23.
2. Hartig, T., et al., Nature and health. Annual review of public health, 2014. **35**(1): p. 207-228.
3. Ajibade, S.-S., et al., New insights into the emerging trends research of machine and deep learning applications in energy storage: a bibliometric analysis and publication trends. International Journal of Energy Economics and Policy, 2023. **13**(5): p. 303-314.
4. Pett, T.J., et al., Unpacking the people–biodiversity paradox: a conceptual framework. BioScience, 2016. **66**(7): p. 576-583.
5. Ajibade, S.-S.M., et al., Evolutionary Insights in Ontology: A Bibliometric Analysis of Cognitive Computing Applications in Cancer Research. Journal of Scientometric Research, 2024. **13**(3): p. 816-832.
6. Bratman, G.N., et al., Nature experience reduces rumination and subgenual prefrontal cortex activation. Proceedings of the national academy of sciences, 2015. **112**(28): p. 8567-8572.
7. Ajibade, S.-S.M., et al. Application of Artificial Intelligence in Malignant Tumors: A Science Mapping Analysis. in 2024 IEEE 15th Control and System Graduate Research Colloquium (ICSGRC). 2024. IEEE.
8. Alebiosu, D.O., et al. COVID-19 Lung CT Image Segmentation: A Comparison of Various U-Net Variants. in International Conference on Intelligent Manufacturing and Robotics. 2024. Springer.
9. Ajibade, S.-S.M., et al. Application of Artificial Intelligence in Healthcare Systems: A Scientometric Analysis. in 2024 International Conference on Science, Engineering and Business for Driving Sustainable Development Goals (SEB4SDG). 2024. IEEE.
10. Ajibade, S.-S.M., et al., A research landscape bibliometric analysis on climate change for last decades: Evidence from applications of machine learning. Heliyon, 2023. **9**(10).
11. Larson, L.R., V. Jennings, and S.A. Cloutier, Public parks and wellbeing in urban areas of the United States. PLoS one, 2016. **11**(4): p. e0153211.
12. Ajibade, S.-S.M., et al. Application of machine learning in renewable energy: a bibliometric analysis of a decade. in 2023 IEEE International Conference on Automatic Control and Intelligent Systems

(I2CACIS). 2023. IEEE.
13. Nawrath, M., et al., Exploring uncharted territory: Do urban greenspaces support mental health in low- and middle-income countries? Environmental research, 2021. **194**: p. 110625.
14. Emambocus, B.A.S., et al. A clustering algorithm employing salp swarm algorithm and K-means. in 2024 20th IEEE International Colloquium on Signal Processing & Its Applications (CSPA). 2024. IEEE.
15. Ajibade, S.-S.M., N.B. Ahmad, and S.M. Shamsuddin, A novel hybrid approach of Adaboostm2 algorithm and differential evolution for prediction of student performance. International Journal of Scientific and Technology Research, 2019. **8**(07): p. 65-70.
16. Jennings, V., L. Larson, and J. Yun, Advancing sustainability through urban green space: Cultural ecosystem services, equity, and social determinants of health. International Journal of environmental research and public health, 2016. **13**(2): p. 196.
17. Kormos, C., et al., Primary forests: definition, status and future prospects for global conservation. The encyclopedia of the anthropocene, 2018. **2**: p. 31-41.
18. Ajibade, S.-S.M., et al. Analysis of Machine Learning (ML) and Internet of Things (IoT): a scientometric review. in 2024 20th IEEE International Colloquium on Signal Processing & Its Applications (CSPA). 2024. IEEE.
19. Ming, T.K., et al. Machine Learning Ensemble Techniques for Prediction of Diabetes. in 2025 21st IEEE International Colloquium on Signal Processing & Its Applications (CSPA). 2025. IEEE.
20. Hoong, J.T.Y., et al. Evaluation of Machine Learning Techniques for Prediction of Breast Cancer. in 2025 21st IEEE International Colloquium on Signal Processing & Its Applications (CSPA). 2025. IEEE.
21. Clark, H., J. Vanclay, and E. Brymer, Forest features and mental health and wellbeing: A scoping review. Journal of environmental psychology, 2023. **89**: p. 102040.
22. Dayupay, J.P., et al. Application of machine learning techniques in energy power production: A publication trend and bibliometrics analysis (2012-2023). in E3S Web of Conferences. 2024. EDP Sciences.
23. Jie, C.Y., et al. A survey on swarm intelligence algorithms for optimizing path planning. in 2025 21st IEEE International Colloquium on Signal Processing & Its Applications (CSPA). 2025. IEEE.
24. AJIBADE, S., et al., An analysis of the impact of social media addiction on academic engagement of students. Journal of Pharmaceutical Negative Results, 2022. **13**.
25. 25. Nagesh, O.S., et al., Boosting enabled efficient machine learning technique for accurate prediction of crop yield towards precision agriculture. Discover Sustainability, 2024. **5**(1): p. 78.
26. Ajibade, T.I., et al. Statistical Analysis of Digital Financial Technology Adoption Research. in 2024 International Conference on Science, Engineering and Business for Driving Sustainable Development Goals (SEB4SDG). 2024. IEEE.
27. Arksey, H. and L. O'malley, Scoping studies: towards a methodological framework. International journal of social research methodology, 2005. **8**(1): p. 19-32.
28. Mohd Aini, A., A.O. Adediran, and Y.R. Seng, The influence of buyers' aesthetic preferences for building facade colors on the pricing of high-rise residential properties: a hedonic pricing model analysis. International Journal of Housing Markets and Analysis, 2025.
29. Turan, N. and G.B. Acar Gül, Psychological effects of earthquakes on individuals without a history of potentially traumatic events: A 1-year longitudinal qualitative study. Journal of Health Psychology, 2025: p. 13591053251347146.
30. Ajibade, S.-S.M., et al. Bibliographic Exploration of Application of Machine Learning and Artificial Intelligence in Solar Energy. in 2024 International Conference on Science, Engineering and Business for Driving Sustainable Development Goals (SEB4SDG). 2024. IEEE.
31. Adediran, A.O., et al., A science mapping analysis of energy efficiency and affordable housing research. International Journal of Energy Economics and Policy, 2024. **14**(6): p. 436-449.
32. Adetunla, A., et al. Harnessing the Power of Artificial Intelligence in Materials Science: An Overview. in 2024 International Conference on Science, Engineering and Business for Driving Sustainable Development Goals (SEB4SDG). 2024. IEEE.
33. Adediran, A.O., et al. Artificial Intelligence Adoption in Housing: A Bibliometric Analysis. in 2025 21st IEEE International Colloquium on Signal Processing & Its Applications (CSPA). 2025. IEEE.
34. Bullard, R.D., Dumping in Dixie: Race, class, and environmental quality. 2018: Routledge.
35. Ajibade, S.-S.M., et al. A Literature Review of Federated Learning for Energy Load Prediction in Smart

Grid. in 2025 6th International Conference on Intelligent Communication Technologies and Virtual Mobile Networks (ICICV). 2025. IEEE.
36. Ostrom, E., Tragedy of the commons, in The new palgrave dictionary of economics. 2008, Springer. p. 1-5.
37. Powell, B.J., et al., Applying the policy ecology framework to Philadelphia's behavioral health transformation efforts. Administration and Policy in Mental Health and Mental Health Services Research, 2016. **43**(6): p. 909-926.
38. Adetunla, A., et al. A review on the Challenges and Prospects in Harnessing Virtual Reality in Education. in 2024 International Conference on Science, Engineering and Business for Driving Sustainable Development Goals (SEB4SDG). 2024. IEEE.
39. Furuyashiki, A., et al., A comparative study of the physiological and psychological effects of forest bathing (Shinrin-yoku) on working age people with and without depressive tendencies. Environmental health and preventive medicine, 2019. **24**(1): p. 46.
40. Nghiem, P., et al., Three-year survival, correlates and salvage therapies in patients receiving first-line pembrolizumab for advanced Merkel cell carcinoma. Journal for immunotherapy of cancer, 2021. **9**(4): p. e002478.
41. Kim, J. and J.C. Lee, Effects of COVID-19 on preferences for private dining facilities in restaurants. Journal of Hospitality and Tourism Management, 2020. **45**: p. 67-70.
42. Gascon, M., et al., Mental health benefits of long-term exposure to residential green and blue spaces: a systematic review. International journal of environmental research and public health, 2015. **12**(4): p. 4354-4379.
43. Bratman, G.N., et al., The benefits of nature experience: Improved affect and cognition. Landscape and urban planning, 2015. **138**: p. 41-50.
44. Simkin, A.J., et al., Photosynthesis in non-foliar tissues: implications for yield. The Plant Journal, 2020. **101**(4): p. 1001-1015.
45. Gu, J., et al., Universal neural machine translation for extremely low resource languages. arXiv preprint arXiv:1802.05368, 2018.
46. Markevych, I., et al., Exploring pathways linking greenspace to health: Theoretical and methodological guidance. Environmental research, 2017. **158**: p. 301-317.
47. Reid, V.M., et al., The human fetus preferentially engages with face-like visual stimuli. Current biology, 2017. **27**(12): p. 1825-1828. e3.
48. Park, Y.J., et al., Contact tracing during coronavirus disease outbreak, South Korea, 2020. Emerging infectious diseases, 2020. **26**(10): p. 2465.
49. Zeng, F., et al., Association of inflammatory markers with the severity of COVID-19: A meta-analysis. International Journal of Infectious Diseases, 2020. **96**: p. 467-474.
50. Thaweethai, T., et al., Development of a definition of postacute sequelae of SARS-CoV-2 infection. Jama, 2023. **329**(22): p. 1934-1946.
51. Bratman, G.N., et al., Nature and mental health: An ecosystem service perspective. Science advances, 2019. **5**(7): p. eaax0903.
52. Vaughan, A., et al., Two cases of monkeypox imported to the United Kingdom, September 2018. Eurosurveillance, 2018. **23**(38): p. 1800509.
53. Levac, D., H. Colquhoun, and K.K. O'brien, Scoping studies: advancing the methodology. Implementation science, 2010. **5**(1): p. 69.
54. Zaidi, A., et al., New insights into the research landscape on the application of artificial intelligence in sustainable smart cities: a bibliometric mapping and network analysis approach. International Journal of Energy Economics and Policy, 2023. **13**(4): p. 287-299.
55. Vaughan, C.A., et al., Park use in low-income urban neighborhoods: who uses the parks and why? Journal of urban health, 2018. **95**(2): p. 222-231.
56. O'Connor, Á., et al., Who benefits? A mixed methods study assessing community use of a major metropolitan park during the COVID-19 pandemic. Journal of Urban Health, 2024. **101**(4): p. 827-844.
57. Sudimac, S., Exposure to Natural versus Urban Environments: Short-term Effects on Stress, Stress-Related Brain Function, and Hippocampal Structure. 2024: Freie Universitaet Berlin (Germany).