



Biodiversity and human well-being: The link between nature and physical or mental health

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Abstract

The theme for this year (2023) is biological diversity Day is "from agreement to action: build back biodiversity" this involves respecting, protecting and repairing our biological wealth. The term biodiversity refers to the variety of life on Earth at all its levels, from genes to ecosystem, and can encompass the evolutionary, ecological and cultural processes that sustain the life. Biodiversity refers to the variety of life on earth, including the diversity of species, ecosystems and genes. However, biodiversity is facing numerous threats that have the potential to cause significant harm to the main biodiversity includes Habitat loss and fragmentation, climate changes, over exploitation, pollution, invasive species and disease. The threats are interconnected and often exacerbate each other, posing significant challenges to biodiversity conservation efforts. Addressing these threats requires a combination of conservation measures, sustainable resources management policy, intervention and global collaborative efforts to protect and restore ecosystem and species. Biodiversity is essential for the processes that support all life on Earth, including humans, without a wide range of animal's plants and microorganisms, we cannot have the healthy ecosystem that we rely on to provide us with the air we breathe and the food we eat and people also value nature to itself.

Keywords: Mitigation, exploitation, invasive, endangered

Introduction

Biodiversity is the variety of life on earth and encompasses the number of species genetic diversity within species and the variety of ecosystems. It is essential for maintaining the health and functioning of our planet. The conservation of biodiversity is needed for the sustainability of ecosystem, nutrient cycle, and climatic regulation, food security or numerous economic benefits. Various measures like reserved and protected areas, sustainable land, resources management, education and awareness' biodiversity friendly policy and Internal Corporation should must be taken to conserve biodiversity. If it is said that the biggest threat to biodiversity is from the human race and due to the loss or decrease of biodiversity, the human species suffers the most. So, it wouldn't be wrong at all. we can know the relationship between humans and biodiversity from their historical, mythological, cultural and social relationship or their interdependence at present time.

The overall conserving biodiversity is crucial for the long term health and sustainability of our planet as well as for the well-being of human society. The main objective of this paper is to understand biodiversity, its need for and importance of mankind and how we can preserve it for future generation.

Biodiversity refers to the variety of life form, including species, genes, and ecosystem, that exist on earth, it encompasses the incredible diversity of plants, animals, microorganism, and their habitats. Biodiversity is vital for the functioning of ecosystems and provides numerous ecological, economic, and cultural benefits.

However, biodiversity is facing numerous threats that have the potential to cause significant harm to ecosystems and species, some of the main biodiversity threats include:

1. Habitat Loss and Fragmentation: The destruction and fragmentation of natural habitats are major threats to biodiversity, this occurs due to activities like deforestation, urbanization, agriculture, and

infrastructure development. When habitats are destroyed or divided into smaller fragments, it can lead to the loss of species, disruption of ecological processes and reduced genetic diversity.

- 2. Climate Change:** Climate change is altering temperature and precipitation patterns globally, which has far-reaching impacts on bio diversity, It can cause shifts in ecosystems and habitats, impacting the distribution and survival of many species Rising temperatures, changing rainfall patterns, and increased frequency and intensity of extreme weather events such as storms, droughts, and floods can have severe consequences for bio diversity.
- 3. Overexploitation:** Overexploitation refers to the unsustainable use of natural resources, including overhunting, overfishing, and illegal wildlife trade. This can lead to decline or extinction of species, disrupt ecosystem, and cause due to the demand for products such as timber, bush meat, seafood, and traditional medicines.
- 4. Pollution:** Pollution, such as water pollution, air pollution, and chemical pollution, poses significant threats to biodiversity. It can harm aquatic species, contaminate soil, disrupt ecosystem, and contribute to decline of population s. pollution can come from various sources, including industrial activities, agricultural practices, plastic waste, and chemical runoff.
- 5. Invasive species:** Invasive species are non-native species that are introduced into new habitats and outcompete native species for resources. They can distrust ecosystems, reduce biodiversity, and cause significant ecological and economic damage. Invasive

species can be introduced intentionally or unintentionally, such as through the pet trade or as a result of human travel and trade.

6. **Disease:** disease outbreaks can have devastating impacts on biodiversity, leading to decline and extinctions of species. Disease can spread rapidly and affect both wildlife and domesticated animals. Factors contributing to the spread of diseases include habitat destruction, climate change, and the movement of pathogens through human activities.

These threats are interconnected and often exacerbate each other, posing significant challenges to biodiversity conservation efforts. Addressing these threats require a combination of conservation measures, sustainable resource management, policy interventions, and global collaborative efforts to protect and restore ecosystems and species,

The requirements for maintaining biodiversity include:

1. **Habitats:** Biodiversity relies on a variety of habitats that provide suitable conditions for different species to thrive. This habitat can include forest, wetlands, grasslands, coral reefs and more protecting and preserving this Habitat is crucial for maintaining biodiversity.
2. **Species interaction:** Different species within an ecosystem rely on one another for various benefits, such as pollination, seed dispersal, predator-prey relationship and nutrient cycle essential for ecosystem function and the survival of many species.
3. **International cooperation:** Addressing biodiversity loss requires Global collaboration and cooperation. Government organizations, and communities need to work together to develop and implement Strategies for biodiversity conservation and sustainable development.
4. **Awareness and Education:** promoting awareness and education about the value and importance of biodiversity is crucial for creating a society that values and actively works towards its preservation. This can involve public outreach, Environmental education programs and sustainable practices in various sectors.
5. **Sustainable Uses:** Balancing the utilization of natural resources with conservation efforts is essential. These involve adopting sustainable practices in agricultures, fisheries, forestry and other sectors to minimize negative impact on biodiversity.

By full filling these requirement, we can help protect and preserve Earth's biodiversity allowing ecosystem to thrive, species to survive and future generation to continue benefiting from the inherent value and services provided by diverse life form.

If it is said that the biggest threat to biodiversity is from the human race and due to the loss or decrease of biodiversity, the human species suffers the most. So it wouldn't be wrong at all. We can know the relationship between humans and biodiversity from their historical, mythological, cultural and social relationship or their interdependence at present time.

Historical relationship of Human with Biodiversity

The history of humans' relationship with nature dates back thousands of years. In the early stages of human development, our ancestors were primarily hunter-gatherers, relying on the natural environment for food, shelter, and other basic needs. They lived in close proximity to nature and had a deep understanding and appreciation for the natural world.

As humans transitioned from hunter-gatherer societies to settled agricultural communities, they started to manipulate and shape the environment to suit their needs. The domestication of plants and animals marked a significant shift in our relationship with nature, as humans began to cultivate crops and raise livestock for sustenance. This intimate connection with the land and nature became central to civilizations such as the ancient Egyptians, Mesopotamians, and Mayans, who relied on agriculture for their survival and development.

The history of human interaction with nature is complex and multifaceted. While there have been periods of exploitation and destruction, there is also a growing recognition of the importance of preserving and conserving the natural environment. The challenges and opportunities in our relationship with nature continue to evolve, with the goal of achieving a balance between human needs and the preservation of the planet's ecosystems.

Mythological connection of humans with biodiversity

In various ancient cultures, there was also a spiritual and mythological connection to nature, with gods and goddesses often representing natural elements such as the sun, moon, wind and water. These beliefs reinforced a reverence for the environment and the recognitions of human dependency on nature.

Many cultures have myths and legends that highlight the interconnectedness between humans and biodiversity, often portraying plants, animals, and natural elements as divine or sacred beings.

Biodiversity is often depicted in mythology as a source of life, wisdom, and spiritual significance, shaping the cultural beliefs and practices of many societies.

Myths and folklore often contain stories of humans living in harmony with nature, emphasizing the importance of respecting and preserving the natural world.

These mythological connections can serve as a cultural foundation for environmental stewardship, encouraging the protection and conservation of biodiversity for future generations.

Exploring and understanding the mythological connection with biodiversity can help to foster a greater appreciation for the natural world and inspire efforts to safeguard its diversity.

Plants of spiritual significance are worshipped in various cultures across the world:

Sacred Fig (*Ficus religiosa*): In Hinduism, the sacred fig tree is considered a symbol of enlightenment and is worshipped as the Bodhi tree, under which the Buddha attained enlightenment.

Lotus (*Nelumbo nucifera*): The lotus is revered in Hinduism, Buddhism, and other religions as a symbol of purity, enlightenment, and rebirth.

Olive tree (*Olea europaea*): In Greek mythology, the olive tree is associated with goddess Athena and is considered a symbol of peace and wisdom.

Ash tree (*Fraxinus excelsior*): In Norse mythology, the ash tree is considered sacred and is associated with the world tree Yggdrasil, which connects the different realms of existence.

Ayahuasca vine (*Banisteriopsis caapi*): Among indigenous Amazonian cultures, the ayahuasca vine is worshipped for its psychoactive properties and is used in spiritual ceremonies for healing and insight.

These examples illustrate the diverse ways in which plants are venerated and worshipped across different cultures for their spiritual and symbolic significance.

Culture connection of humans with biodiversity

The culture connection between humans and nature refers to the way in which human societies and individuals interact with and perceive the natural world. It encompasses the beliefs, values, practices, and traditions that shape human behavior towards nature.

Different cultures have developed unique relationships with nature over time, influenced by factors such as geography, climate, available resources, and historical experiences. These connections can range from harmonious and symbiotic relationships to exploitative and destructive ones.

Many indigenous cultures have a deep spiritual and cultural connection with biodiversity, viewing it as a source of knowledge, traditions, and identity. Biodiversity often plays a central role in traditional practices, rituals, and ceremonies, reflecting the close relationship between humans and the natural world. Cultural practices such as traditional medicine, food, and art are often derived from and reliant on biodiversity, showcasing the interconnectedness between humans and the environment.

In agricultural societies, nature is often viewed as a provider of food and resources. Practices such as farming, hunting, and fishing are deeply rooted in these cultures, and traditional knowledge is passed down through generations to understand and work in harmony with natural cycles.

It is important to note that these cultural connections are not static but rather evolve and adapt over time. They can be influenced by external factors such as globalization, technological advancements, and shifts in societal values.

In modern industrialized cultures, the cultural connection to nature has changed significantly. The focus has shifted towards exploiting natural resources for economic growth, resulting in more disconnected and exploitative relationships with the environment. However, there is also an increasing movement to reestablish a more sustainable and interconnected relationship with nature through practices such as conservation, environmental education, and the recognition of indigenous knowledge systems.

The culture connection between humans and nature is crucial for our well-being and the health of the planet. Recognizing and fostering a positive and sustainable relationship with the natural world can lead to more mindful use of resources, conservation efforts, and a deeper appreciation for the interconnectedness of all life. The loss of biodiversity can have profound cultural implications, as it erodes traditional knowledge, disrupts cultural practices, and threatens the cultural identity of indigenous communities. Recognizing and preserving the culture connection with biodiversity is essential for promoting sustainable conservation efforts and for fostering a greater understanding of value of biodiversity.

How Loss of Biodiversity Effects Human Well Being and Mental Health

Recognizing the link between biodiversity loss, Eco anxiety and mental health is crucial. it highlights the need for Holistic approaches that addresses both ecological and psychological well-being. Promoting nature- based therapy, engaging with nature, advocated for policy changes and prioritized environmental conservation and fostering education and awareness.

Ecoanxiety: Eco anxiety, also known as climate anxiety or environmental anxiety refers to the psychological distress and anxiety caused by concerns about environmental issues, particularly biodiversity loss. Biodiversity loss refers to the rapid decline of species and Ecosystem on Earth due to human activity such as deforestation, Habitat destruction, pollution and climate change.

As people become more aware of the magnitude and consequences of biodiversity loss, they may experience feeling of stress, fear, helplessness, and grief about the state of the environment and the potential impact on future generations. The loss of diverse plant and animal species and the degradation of ecosystems can evoke a sense of despair and existential crisis in individuals who care deeply about the natural world. Individuals experiencing ecoanxiety may feel overwhelmed by the magnitude of environmental problems and the perceived lack of action to address them.

It is often characterized by feelings of fear, helplessness, and worry about the impact of climate change, deforestation, loss of biodiversity, and other environmental issues.

This anxiety can lead to emotional distress, depression, and a sense of loss or grief over the degradation of the natural world.

The psychological impact of biodiversity loss is closely linked to concerns about climate change, deforestation, ocean acidification, and other environment crises. The interconnectedness of these issues exacerbates Eco- anxiety as individuals may feel overwhelmed by the magnitude and urgency of the challenges facing the planet.

Eco anxiety can have deterred mental effects on mental health, leading to increase level of stress, anxiety, depression and even post-traumatic stress disorder (PTSD). It can also impact overall well-being, sleep patterns, and the ability to concentrate or remain optimistic about the future.

Biodiversity loss has been associated with negative impacts on mental health.

Biodiversity loss has been associated with negative impacts on mental health. As ecosystems degrade and species disappear, individuals may experience feelings of grief, sadness, and hopelessness. The loss of natural environments that people connect with can contribute to a sense of disconnection and distress.

Research has linked exposure to biodiversity and natural environments with improved mental health outcomes. Being in nature, experiencing biodiversity, and engaging in activities like wildlife watching or gardening have been shown to reduce symptoms of anxiety and depression, enhance mood, and increase feelings of well-being and connectedness.

Biodiversity loss can lead to a decrease in ecosystem services, such as clean air and water, which are essential for human well-being. The decline in these services can

negatively impact mental health, increasing stress and contributing to emotional distress.

Climate change, which is a major driver of biodiversity loss, is also linked to mental health issues. The increasing frequency of extreme weather events, displacement, and loss of livelihoods can lead to heightened anxiety, depression, and PTSD.

Indigenous communities and marginalized populations, who often have a strong connection to their environment and rely on natural resources for their well-being, are particularly vulnerable to the mental health impacts of biodiversity loss. Disruption of their traditional ways of life and loss of cultural practices and knowledge can have severe psychological repercussions.

Addressing the mental health impacts of biodiversity loss requires a multidisciplinary approach that combines conservation efforts, climate action, and mental health support. Promoting nature-based interventions and conservation initiatives, investing in sustainable and equitable practices, and providing mental health services that acknowledge the interconnectedness of environmental and mental well-being are all important steps in addressing this issue.

Biodiversity loss has a range of physiological impacts on human health.

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Loss of biodiversity can lead to an increase in vector-borne diseases. When ecosystems become imbalanced, the populations of certain species, such as mosquitoes, can rise, increasing the risk of diseases like malaria, dengue fever, and Lyme disease.

Reduced biodiversity can also impact food security and nutrition. As species disappear, agricultural systems become less resilient and more vulnerable to pests and diseases. This can lead to decreases in crop yields and quality, which in turn can affect human nutrition and overall health.

Biodiversity loss can also have indirect impacts on physical health through the disruption of ecosystem services. For example, forests play a crucial role in regulating air quality by absorbing pollutants and producing oxygen. With the loss of forests, air pollution can increase, which can lead to respiratory problems and other health issues.

Similarly, the loss of biodiversity can affect water quality. Wetlands, for example, act as natural water filters, purifying water by trapping and filtering pollutants. With the destruction of wetlands, the quality of water sources can decline, posing risks to human health through contaminated water supplies.

The overall loss of biodiversity and degradation of ecosystems can exacerbate climate change. This, in turn, has direct physiological impacts, such as heat-related illnesses and cardiovascular problems due to increased temperatures and extreme weather events.

However, it's important to note that the loss of biodiversity can also have negative impacts on human mental health. When natural environments and species are lost, it can lead to feelings of grief, loss, and disconnection, known as "ecological grief." The loss of access to nature can also limit opportunities for nature-based recreation and relaxation, which can negatively impact mental health.

Protecting and restoring biodiversity is essential for maintaining a healthy environment and preventing the

physiological health impacts associated with biodiversity loss. Implementing sustainable land-use practices, conserving ecosystems, and promoting biodiversity-friendly agriculture are all critical steps in safeguarding human health. Biodiversity is essential for human well-being because it can have a positive impact on human in several ways:

Psychological Well-being: Experiencing and being surrounded by natural environments, which are often rich in biodiversity, can promote feelings of relaxation, calmness, and happiness. Research has shown that exposure to nature, including diverse ecosystems and wildlife, can reduce stress, anxiety, and symptoms of depression.

Restorative Effects: Spending time in natural environments with high biodiversity can help restore cognitive functioning and attention. It can provide a break from the demands of everyday life and give people the opportunity to relax and rejuvenate.

Sense of Meaning and Purpose: Biodiversity can contribute to a sense of purpose and connection to something larger than ourselves. Engaging with and appreciating the diversity of life on Earth can instill a sense of awe and wonder, leading to greater life satisfaction and purpose.

Cultural and spiritual significance: Biodiversity is deeply intertwined with the cultural and spiritual beliefs of many societies. People often have strong connections to specific species or ecosystems that are considered sacred or essential to their cultural identity.

Traditional knowledge and practices: Many indigenous and local communities have developed extensive knowledge about the use and management of biodiversity over generations. This traditional knowledge is often crucial for sustainable resource management and is passed down through social connections within communities.

Livelihoods and socio-economic benefits: Biodiversity provides essential resources for people's livelihoods, including food, medicine, and materials for traditional crafts. The social connections between individuals and biodiversity are often based on the direct dependence of communities on natural resources.

Recreation and mental well-being: People often have strong social connections to biodiversity through recreational activities such as bird watching, hiking, or nature photography. Nature also provides mental and emotional benefits, fostering a sense of connection and well-being.

Increased Social interaction, Social movements and conservation: The protection of biodiversity often involves social movements and community-based conservation efforts. People come together to advocate for the conservation of critical habitats and species and form social connections to promote biodiversity conservation. Biodiverse habitats provide opportunities for people to engage in various nature-based activities; these activities often bring people together and foster social connections, which can have positive effects on society.

Education and awareness: Social connections between individuals and biodiversity are fostered through educational initiatives that promote awareness and engagement with nature. This helps shape attitudes and behaviors towards biodiversity conservation.

Biophilia Hypothesis: The biophilia hypothesis suggests that humans have an innate affinity towards living organisms, including biodiversity. The presence of diverse plant and animal species can evoke positive emotional responses, such as joy and fascination, which can improve mental well-being.

Recognizing the link between biodiversity loss, Eco anxiety and mental health is crucial. It highlights the need for Holistic approaches that address both ecological and psychological well-being. Promoting nature-based therapy, engaging with nature, advocated for policy changes and prioritized environmental conservation and fostering education and awareness.

Building Ecological Resilience: the ability of an ecosystem to maintain its normal patterns after being any subject to damage caused by an ecological disturbance, this can be achieved by following

1. **Enhance biodiversity:** Encourage diverse plant and animal species to strengthen ecosystems and make them more resilient to environmental changes.
2. **Sustainable land use:** Implement practices that protect natural resources and reduce environmental degradation.
3. **Conservation efforts:** Preserve natural habitats and protect endangered species to maintain ecological balance.
4. **Climate adaptation:** Develop strategies to mitigate the impacts of climate change and build resilience to extreme weather events.
5. **Regenerative agriculture:** Implement farming practices that promote soil health and biodiversity to create resilient agricultural systems.

Fostering a Sense of Empowerment

By empowering people and involving them in decision-making processes, development interventions can become more inclusive and responsive for the aspirations of the people. It would be beneficial for successful engagements of people in reducing threats to globally important biodiversity.

1. **Education and awareness:** Provide knowledge and information to help individuals and communities understand environmental issues and take meaningful action.
2. **Community engagement:** Encourage participation in decision-making processes and empower communities to take ownership of environmental conservation efforts.
3. **Skill-building:** Provide training and resources to develop the skills needed to engage in sustainable practices and environmental stewardship.

4. **Advocacy and activism:** Support platforms for individuals to engage in advocacy for environmental causes and influence policy decisions.

5. **Collaboration and support:** Foster partnerships and networks to empower individuals and communities to work together towards common environmental goals.

Climate action to reduce the loss of biodiversity

It involves implementing strategies and measures aimed at addressing the impacts of climate change on ecosystems and species. Some key approaches to climate adaptation for biodiversity conservation include:

1. **Protected Areas Management:** Enhancing the management of protected areas to ensure the conservation and resilience of key habitats and species in the face of climate change. This can include expanding protected area networks, establishing wildlife corridors, and improving connectivity between habitats.
2. **Species Conservation:** Implementing conservation measures to safeguard vulnerable and endangered species from the impacts of climate change. This may involve captive breeding programs, translocation efforts, and habitat restoration to create refuges for species at risk.
3. **Habitat Restoration:** Restoring and creating resilient habitats, such as wetlands, forests, and coastal ecosystems, to enhance their ability to cope with climate change impacts. This can involve reforestation, mangrove restoration, and the creation of green infrastructure to provide ecological services.
4. **Climate-Resilient Agriculture:** Promoting sustainable agricultural practices that reduce greenhouse gas emissions, protect natural habitats, and enhance the resilience of agricultural ecosystems to climate change, thereby reducing pressure on biodiversity.
5. **Community Engagement:** Involving local communities in biodiversity conservation and climate adaptation efforts, recognizing their traditional ecological knowledge and fostering their active participation in conservation initiatives.
6. **Ecosystem-based Adaptation:** Implementing ecosystem-based approaches that use natural processes and biodiversity to help people adapt to the adverse effects of climate change, such as protecting coastal areas from storms or using natural floodplains for flood control.

By integrating climate adaptation strategies into biodiversity conservation efforts, we can better protect ecosystems, species, and the services they provide in the face of a changing climate.

Eco therapy

Eco therapy also known as nature therapy or green therapy, refers to the practice of connecting with nature to improve mental and physical well-being.

Spending time in nature has been shown to reduce stress, anxiety, and depression. Exposure to natural settings can help calm the mind, reduce mental fatigue, and promote relaxation. Engaging in activities such as walking, hiking, gardening, or simply sitting in nature can improve mood, increase feelings of happiness, and boost overall mental health. Ecotherapy can also have physical health benefits. Spending time in green spaces has been associated with reduced blood pressure, improved immune function, and enhanced overall physical fitness.

Ecotourism

Ecotourism involves responsible travel to natural areas that conserves the environment and improves the well-being of local people.

Ecotourism aims to promote conservation through supporting local conservation efforts and educating visitors about environmental. Ecotourism often involves working with and benefiting local communities, promoting economic development and empowering residents to conserve natural resources. It encourages activities that have minimal impact on the environment, such as wildlife viewing, hiking, and nature photography. Economic benefits Ecotourism can generate income for local communities and contribute to the preservation of natural areas, helping to provide incentives for conservation.

In various ancient cultures, there was also a spiritual and mythological connection to nature, with gods and goddesses often representing natural elements such as the sun, moon, wind and water. These beliefs reinforced a reverence for the environment and the recognition of human dependency on nature.

With the advancement of industrialization and urbanization in the late 18 and 19th century human societies become increasingly disconnected from the natural world. The focus shifted towards exploiting natural resources for economic growth, resulting in the degradation of environment and loss of biodiversity. The impact of these exploitations becomes more evident in the 20th century, with issues such as pollution; deforestation and climate change become global concerns.

However, in recent decades there has been an increasing awareness of the need to restore and reestablish our connection with nature. The environment movement and sustainable development practice have gained momentum, aiming to promote a more harmonious and responsible relationship with the natural world. This includes efforts such as eco therapy, ecological Resilience, conservation initiative, eco tourism, renewable energy adoption, and the recognition of indigenous knowledge systems for their sustainable practices. Experiencing and being surrounded by natural environments, which are often rich in biodiversity, can promote feelings of relaxation, calmness, and happiness. Research has shown that exposure to nature, including diverse ecosystems and wildlife, can reduce stress, anxiety, and symptoms of depression.

Spending time in natural environments with high biodiversity can help restore cognitive functioning and attention. It can provide a break from the demands of everyday life and give people the opportunity to relax and rejuvenate. Overall, preserving and promoting biodiversity is crucial not only for ecological reasons but also for the well-being of human populations. By protecting and restoring natural habitats, and ensuring individuals have

access to biodiverse environments, we can support and we will give a positive environment for future.

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