

The Impacts of Ecocide on Human Health: A Systematic Review of the Evidence and Implications for Environmental Justice

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Abstract

Ecocide is a deliberate wiping out of the natural environment, including ecosystems, biodiversity, and natural resources, resulting in harm to human health and the environment which has become a pressing concern, particularly in the context of climate change. This paper aims to synthesize the existing evidence on the impacts of ecocide on human health, with a focus on the implications for environmental justice. The objective of the paper is to systematically review the evidence on the impacts of ecocide on human health, highlighting the various pathways through which environmental destruction affects human well-being. The methodology applied in this paper is doctrinal approach. The paper's findings are; that the health consequences of ecocide activities, which ranges from respiratory diseases, cancers, reproductive disorders and neurological impairments is traceable to illegal oil spills, toxic waste dumping, deforestation, and industrial pollution are borne disproportionately by economically disadvantaged and politically marginalized communities. These events have underscored the urgent need for environmental justice, which prioritizes the health and well-being of marginalized communities within the Niger Delta Region and other remote areas towards promoting sustainable environmental practices. The implications are twofold. Firstly, it highlights the need for policymakers to prioritize environmental protection and public health. Secondly, it emphasizes the importance of community-led initiatives in promoting environmental justice. In conclusion, there is a proposition for severe penalty for perpetrators of ecocide and adequate reparations for harm inflicted on the people and the community.

Keywords: Ecocide, Human health, Environmental justice, Climate change, Sustainable development and Public health.

1. Introduction

The natural environment is the foundation of human health and well-being, providing essential ecosystem services, including clean air and water, food security, and climate regulation. However, human activities are increasingly causing widespread environmental destruction, known as ecocide, which poses significant risks to human health. Ecocide, characterized by the destruction of ecosystems, loss of biodiversity, and pollution of natural resources, has severe and far-reaching

consequences for human well-being. This paper is crucial in highlighting the devastating impacts of ecocide on human health and the need for environmental justice. This theme is justified for several reasons. Firstly, the environmental crisis is deepening, with ecocide becoming increasingly prevalent, and its impacts on human health are becoming more apparent. Secondly, vulnerable populations, including indigenous communities and low-income communities, are disproportionately affected by ecocide, emphasizing the need for environmental justice. In addition, the paper highlights the critical intersection between environmental protection and human health, emphasizing the need for integrated solutions to address the impacts of ecocide.

The impacts of ecocide on human health are complex and far-reaching, including increased mortality, morbidity, and mental health problems. Climate change, deforestation, pollution, and loss of biodiversity are all aspects of ecocide that have severe consequences for human well-being. Furthermore, ecocide often has a disproportionate impact on vulnerable populations, exacerbating existing health disparities and environmental injustices. A logical appraisal of the evidence on the impacts of ecocide on human health is essential to inform policy and practice, emphasizing the need for urgent action to prevent ecocide and protect human health. By exploring the impacts of ecocide on human health and the implications for environmental justice, this paper provides a critical opportunity to highlight the need for integrated solutions to address the environmental crisis and promote a healthier, more sustainable future for all.

However, one influential definition that was proposed by British lawyer and environmental advocate Polly Higgins, defined ecocide as “extensive damage to, destruction of or loss of ecosystems of a given territory... such that peaceful enjoyment by the inhabitants have been or will be severely diminished”. This definition underscores the link between ecological harm and the disruption of human life and well-being. The definition by the Independent Expert Panel for the

Legal Definition of Ecocide, defined ecocide as “unlawful or wanton acts committed with knowledge that there is a substantial likelihood of severe and either widespread or long-term damage to the environment”. This legal framing emphasizes the element of intent and the scale of damage. Also, the third definition, emerging from the Stop Ecocide Foundation, characterizes ecocide as “mass damage and destruction of ecosystems—harmful to nature and humans—committed knowingly and recklessly”.

It should be noted, however, that there is no consensus on the definition of ecocide. Part of the difficulty in defining the term comes from how reasonable it would be to make trying the crime a reality. Another definition given of ecocide is “a planned effort to eliminate all or part of an ecosystem”.¹ This definition clearly draws from the definition of genocide, involving the “destruction of a group, in whole or in part”.² Though ambitious, this definition is too broad in its scope. Destroying an ecosystem, be it in whole or in part, is a definition irreconcilable with the free reign humans have over the planet and our tendencies towards altering our environments. Furthermore, ecocide is not limited to the actions of states. Corporations are equally capable of perpetrating ecocide. This is in part due to the fact that the current parameters that businesses operate internationally had allowed for the destruction of the planet.³

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¹Chris Park and Michael Allaby. *A Dictionary of Environment and Conservation*, (Published Online, Oxford University Press, 2017), “ecocide”.

²Article 6, Rome Statute.

³ Polly Higgins, *‘Eradicating Ecocide: Exposing the Corporate and Political Practices Destroying the Planet and Proposing the Laws Needed to Eradicate Ecocide’*, (London, Shephard-Walwyn, 2010).

However, Ecocide is the extensive destruction, damage to or loss of ecosystem(s) of a given territory, whether by human agency or by other causes, to such an extent that peaceful enjoyment by the inhabitants of that territory had been severely diminished.⁴

Ecocide, or widespread destruction of the environment, has become a pressing concern globally. The impacts of ecocide on human health are multifaceted and far-reaching, affecting not only physical health but also mental well-being and social relationships. This paper aims to synthesize the existing evidence on the impacts of ecocide on human health, with a focus on the implications for environmental justice. Environmental degradation, climate change, and pollution have been linked to significant health impacts, including, increased morbidity and mortality from respiratory diseases, cardiovascular diseases, and mental health disorders.⁵ Recent ecocide events, such as the 2019-2020 Australian bushfires,⁶ the 2020 Amazon rainforest fires,⁷ and the ongoing pollution in the Niger Delta,⁸ have highlighted the urgent need for environmental protection and public health measures.

In Nigeria, the oil spills in the Niger Delta have had devastating health impacts on local communities.⁹ A study published in the *Environmental Health Perspectives Journal* found that exposure to oil spills increased the risk of respiratory problems, skin irritation, and other health problems.¹⁰

⁴ International Law Commission, 2019

⁵ *Ibid.*

⁶ Australian Government, '2019-2020 Bushfires: A Review of the Australian Government's Response' (2020).

⁷ Amazon Watch, 'Amazon Rainforest Fires: A Crisis of Epic Proportions.' (2020).

⁸ Niger Delta Development Commission, 'Environmental Degradation in the Niger Delta: A Review of the Evidence' (2020).

⁹ Environmental Health Perspectives, 'Health Impacts of Oil Spills in the Niger Delta'. (2019).

¹⁰ Environmental Degradation and Human Health in the Niger Delta. *Journal of Environmental Health*. (2020).

Similarly, in the United States, the Flint water crisis has highlighted the impacts of environmental degradation on human health.¹¹ The crisis, which began in 2014, resulted in widespread lead contamination of the city's water supply, leading to significant health impacts, including developmental delays, learning disabilities, and behavioral problems.¹² Ecocide is closely linked to environmental justice, as it disproportionately affects vulnerable populations, including children, women, and marginalized communities. Environmental justice emphasizes the need for fair distribution of environmental benefits and burdens, and the protection of human rights and dignity. The evidence from the paper highlights the significant health impacts of ecocide on human health, including respiratory problems, cardiovascular diseases, mental health disorders, and other health problems. The evidence also emphasizes the importance of environmental justice in addressing these impacts, prioritizing the health and well-being of marginalized communities and promoting sustainable environmental practices. This paper will systematically review the evidence on the impacts of ecocide on human health, examining the implications for environmental justice and highlighting the need for integrated solutions to address the environmental challenges.

2. Presentation of the Main Findings

The studies examined the impacts of ecocide on human health, including respiratory problems, cardiovascular diseases, mental health disorders, and other health problems. The paper found that ecocide had significant health impacts on vulnerable populations, including children, women, and marginalized communities. The paper also found that the health consequences of ecocidal activities such as illegal oil spills, toxic waste dumping, deforestation, and industrial pollution—

¹¹ Centers for Disease Control and Prevention, 'Flint Water Crisis: A Review of the Evidence'. (2020).

¹² Environmental Health Perspectives, 'Health Impacts of the Flint Water Crisis. (2019).

are borne disproportionately by economically disadvantaged and politically marginalized communities.

In addition, the paper found that a strong and consistent association between ecocide and a wide range of adverse health outcomes, including respiratory diseases, cancers, reproductive disorders, and neurological impairments. Exposure to pollutants like heavy metals, dioxins, and particulate matter released during ecocidal acts is frequently linked to increased morbidity and mortality rates, especially among children and the elderly.

Moving forward, the findings would also likely emphasize the lack of robust legal mechanisms to hold perpetrators of ecocide accountable for the resulting public health crises. In many jurisdictions, the legal framework does not recognize ecocide as a punishable crime, thereby allowing corporations and state actors to evade responsibility for long-term ecological and human harm.

Furthermore, another important finding would be the relative neglect of mental health and psychosocial impacts in the existing literature. Individuals and communities affected by ecocide often experience chronic stress, trauma, displacement, and cultural disintegration, which may lead to depression, anxiety, and community-wide despair. The review also found that environmental justice provides a powerful framework for addressing the health impacts of ecocide, as it prioritizes the health and well-being of marginalized communities and promotes sustainable environmental practices. The existing evidence on the impacts of ecocide on human health, highlighting the significant health impacts on vulnerable populations and the importance of environmental justice to address these impacts. The paper's findings have implications for policymakers, public health practitioners, and environmental advocates, emphasizing the need for sustainable environmental

practices, environmental justice, and public health measures to mitigate the health impacts of ecocide.

3. Significance of the Study

This study is significant because it highlights the urgent need for environmental protection and public health measures to mitigate the impacts of ecocide on human health. The study's findings will inform policymakers, public health practitioners, and environmental advocates on the need for sustainable environmental practices, environmental justice, and human rights protection.

4. Scope and Limitations

This paper will focus on the impacts of ecocide on human health, with a particular emphasis on vulnerable populations. The paper will use a doctrinal methodology to analyze existing literature on the topic. However, the study is limited by its reliance on existing literature, which may not capture the full range of impacts of ecocide on human health. Additionally, the study's focus on vulnerable populations may not capture the experiences of other populations affected by ecocide.

4.1 Limitations of Ecocide for Environmental Justice

While ecocide has significant implications for environmental justice, there are also several limitations to consider.

- a). Lack of International Recognition: Ecocide is not yet recognized as an international crime, which can limit the ability to hold perpetrators accountable.
- b). Limited Legal Frameworks: Many countries lack legal frameworks to address ecocide, which can make it difficult to prosecute cases and provide justice for victims.

c). Power Imbalances: Ecocide often involves power imbalances, where powerful corporations or governments are able to exploit and degrade the environment with impunity.

d). Lack of Public Awareness: Ecocide is often not well understood by the public, which can limit the ability to build momentum for change.

e). Complexity of Ecocide: Ecocide is a complex issue that involves multiple factors, including environmental degradation, human rights violations, and power imbalances, which can make it difficult to address.

f). Human Rights Abuses: Government agents often perpetrate human rights abuses in the context of ecocide. This can include forced displacement of communities, violence against environmental defenders, and denial of access to justice.¹³ For instance, the Philippine government's crackdown on environmental activists and indigenous communities has been criticized for its human rights abuses¹⁴. Government agents may commit human rights abuses, such as forced displacement and violence, against communities that resist ecocidal activities.

5. Implications of Ecocide for Environmental Justice

Ecocide, the destruction of the environment, has far-reaching implications for environmental justice, exacerbating existing inequalities and perpetuating human rights violations.¹⁵ The convergence of ecocide and environmental injustice has devastating consequences, disproportionately affecting vulnerable populations, including low-income communities, indigenous peoples, and marginalized groups.¹⁶

¹³ Human Rights Watch, 'Environmental Human Rights Defenders' (2020).

¹⁴ Amnesty International, 'Philippines: Human rights defenders under attack' (2020).

¹⁵ United Nations Environment Programme, 'Environmental Justice'. (2019).

¹⁶ World Health Organization, 'Environmental Health Inequalities. (2018).

One of the most significant implications of ecocide for environmental justice is the displacement of communities.¹⁷ The destruction of natural habitats, pollution of water sources, and degradation of land quality force communities to flee their homes, leading to social, cultural, and economic disruption.¹⁸ For instance, the extraction of fossil fuels in the Niger Delta has led to widespread displacement of communities, with many forced to relocate to urban areas, where they face poverty, unemployment, and social exclusion.¹⁹

Ecocide also perpetuates environmental racism, a form of systemic racism that disproportionately affects communities of colour.²⁰ The siting of polluting industries, such as toxic waste dumps and refineries, in communities of color is a stark example of environmental racism.²¹ The Flint water crisis, where lead-contaminated water was supplied to a predominantly African American community, is a devastating illustration of environmental racism and its implications for environmental justice.²²

Moving forward, ecocide undermines the rights of indigenous peoples to their ancestral lands, territories, and resources.²³ The extraction of natural resources, such as timber, minerals, and oil, often occurs without the free, prior, and informed consent of indigenous peoples, violating their rights and perpetuating historical injustices.²⁴ The construction of the Dakota Access Pipeline, which traverses sacred indigenous lands and threatens water sources, is a poignant example of the violation of indigenous rights and the implications of ecocide for environmental justice.²⁵ Ecocide

¹⁷ Internal Displacement Monitoring Centre, 'Global Report on Internal Displacement. (2020).

¹⁸ United Nations High Commissioner for Refugees, 'Environmental Degradation and Displacement. (2020).

¹⁹ Amnesty International, 'Nigeria: The True Cost of Oil'. (2019).

²⁰ R. D. Bullard, 'Dumping in Dixie: Race, Class, and Environmental Quality' (2000).

²¹ United Church of Christ, 'Toxic Wastes and Race in the United States. (1987).

²² Flint Water Crisis, 'Timeline of Events. (2020).

²³ United Nations Declaration on the Rights of Indigenous Peoples. (2007).

²⁴ Amnesty International, 'Indigenous Peoples and the Rights to their Ancestral Lands. (2019).

²⁵ Standing Rock Sioux Tribe, 'Dakota Access Pipeline.' (2020).

can lead to the loss of livelihoods, as environmental degradation can destroy ecosystems and other natural resources that communities depend on for their survival. Additionally, Ecocide can lead to the destruction of cultural heritage, as environmental degradation can damage or destroy sacred sites, cultural artifacts, and traditional ways of life.

In addition, ecocide aggravates climate change, which disproportionately affects vulnerable populations, including low-lying coastal communities, small island developing states, and arid and semi-arid regions.²⁶ Climate change perpetuates existing inequalities, undermining the rights of marginalized communities to life, health, and a safe environment.²⁷ The devastating impacts of Hurricane Katrina on African American communities in New Orleans, where poverty, racism, and environmental degradation converged, is a stark illustration of the implications of ecocide and climate change for environmental justice.²⁸

6. Causes of Ecocide

Ecocide, the destruction of the natural environment, is a pressing issue that threatens the very survival of our planet. The causes of ecocide are complex and multifaceted, involving historical, economic, and demographic factors. This discussion will explore the causes of ecocide from three distinct angles: colonialism and imperialism, capitalism and consumerism, and population growth and consumption patterns. The causes of ecocide ranges from remote and immediate factors, they are traceable to the unfriendly activities of human agents within our immediate milieu.

6.1 Remote Causes

1. Colonialism and Imperialism

²⁶ Intergovernmental Panel on Climate Change, 'Climate Change 2013: The Physical Science Basis' (2013).

²⁷ United Nations Framework Convention on Climate Change, 'Paris Agreement. (2015).

²⁸ R. D Bullard and B. Wright, 'Race, Place, and Environmental Justice After Hurricane Katrina. (2009).

Colonialism and imperialism have played a significant role in the destruction of the natural environment. The exploitation of natural resources, land grabbing, and the imposition of foreign economic systems have led to the degradation of ecosystems and the loss of biodiversity.

a). **Exploitation of Natural Resources:** Colonial powers exploited natural resources, such as timber, minerals, and fossil fuels, without regard for the long-term consequences. This exploitation led to deforestation, pollution, and the depletion of natural resources; **Land Grabbing:** Colonial powers seized land from indigenous peoples, leading to the displacement of communities and the destruction of traditional livelihoods. This land grabbing has continued to the present day, with corporations and governments acquiring land for agricultural, mining, and logging purposes.

b). **Imposition of Foreign Economic Systems:** Colonial powers imposed foreign economic systems, such as capitalism on colonized countries. These economic systems prioritize growth and profit over environmental protection and social welfare. Colonial and imperial powers exploited natural resources, leading to environmental degradation and displacement of indigenous communities.²⁹

2. Capitalism and Consumerism

Capitalism and consumerism are driving forces behind ecocide. The pursuit of profit and growth has led to the exploitation of natural resources, pollution, and waste.

a). **Profit-Driven Economy:** Capitalism prioritizes profit over environmental protection and social welfare. Corporations are driven to maximize profits, regardless of the environmental costs.

²⁹ A.W.Crosby, 'Ecological Imperialism: The Biological Expansion of Europe, 900-1900'(Cambridge University Press, 2004).

b). Consumer Culture: Consumerism encourages individuals to purchase more goods and services, leading to increased resource extraction, production, and waste.

c). Planned Obsolescence: Corporations design products with planned obsolescence, ensuring that products have a limited lifespan and must be replaced frequently. This perpetuates a cycle of consumption and waste. The pursuit of economic growth and profit has driven environmental destruction as corporations prioritize short-term gains over sustainability.³⁰

3. Population Growth and Consumption Patterns:

Population growth and consumption patterns are significant contributors to ecocide. As the global population grows, so does the demand for resources, leading to increased exploitation and degradation of the environment.

a). Population Growth: The global population has grown exponentially, leading to increased demand for resources, such as food, water, and energy.

b). Consumption Patterns: Consumption patterns, particularly in developed countries, are characterized by high levels of resource extraction, production and waste.

c). Resource Intensity: The production of goods and services requires significant resources, leading to deforestation, pollution, and the depletion of natural resources. Increasing global population and consumption patterns have put pressure on natural resources, leading to deforestation, pollution, and climate change.³¹

6.2 Immediate Causes

1. Deforestation and Land Degradation:

³⁰ N. Klein, 'This Changes Everything: Capitalism vs. the Climate'. Simon and Schuster. (2014)

³¹ United Nations, 'World Population Prospects 2019' (2020).

Deforestation and land degradation are significant contributors to ecocide. The clearance of forests for agriculture, urbanization, and logging. For instance, the Amazon rainforest had been devastated, with widespread deforestation causing irreparable damage to the ecosystem. Similarly, Indonesia's forests have been rapidly depleted, primarily due to palm oil production, leading to habitat loss and increased greenhouse gas emissions. Widespread deforestation and land degradation have led to loss of biodiversity, soil erosion, and increased greenhouse gas emissions.³²

2. Pollution and Waste Management:

Population growth and inadequate waste management are also driving forces behind ecocide. As the global population increases, so does the demand for resources, leading to increased waste generation and environmental degradation. The improper disposal of waste, particularly plastics, has resulted in massive pollution, harming marine life and contaminating the food chain. Furthermore, the extraction and production of resources to meet the demands of a growing population have led to environmental destruction, including deforestation, pollution, and habitat destruction. Inadequate waste management and pollution have contaminated air, water, and soil, harming human health and ecosystems.³³

3. Climate Change and Natural Disasters:

Climate change and natural disasters are exacerbating ecocide. Rising temperatures, sea-level rise, and extreme weather events are causing devastating impacts on ecosystems, including coral bleaching, melting of polar ice caps, and altered species distributions. Natural disasters, such as hurricanes, wildfires, and floods, are also contributing to ecocide, destroying habitats, and

³² Food and Agriculture Organization, 'The State of the World's Forests' (2020).

³³ World Health Organization, Environmental Health. (2018).

displacing communities. The Russian invasion of Ukraine, for example, has resulted in significant environmental damage, including oil spills, pollution and destruction of natural habitats. Climate change has exacerbated natural disasters, such as hurricanes, droughts, and wildfires, leading to environmental degradation and human suffering.³⁴

7. Consequences of Ecocide

The consequences of ecocide are severe, far-reaching and interconnected. It is essential to recognize ecocide as a crime and take immediate action to prevent further environmental destruction and protect human rights. It includes the following:

7.1 Environmental Consequences

1. Loss of Biodiversity:

Ecocide leads to the destruction of ecosystems, resulting in the loss of biodiversity. This can be seen in the deforestation of the Amazon rainforest, where widespread destruction has pushed many species to the brink of extinction. The clearance of forests for agriculture, urbanization, and logging has led to the loss of habitats, disrupting delicate ecosystems and causing irreparable damage. For instance, the Vietnamese Javan rhinoceros was declared extinct in 2010 due to habitat loss and poaching. Ecocide has led to the extinction of numerous species, compromising ecosystem services and human well-being.³⁵

2. Climate Change:

³⁴ Intergovernmental Panel on Climate Change, 'Climate Change and Land' (2019).

³⁵ Millennium Ecosystem Assessment, 'Ecosystems and Human Well-being' (2005).

Climate change is another significant environmental consequence of ecocide. The destruction of natural habitats, such as forests and wetlands, releases stored carbon into the atmosphere, contributing to global warming. Rising temperatures, in turn, lead to more frequent natural disasters, such as hurricanes, wildfires, and floods. For example, the Russian invasion of Ukraine has resulted in significant environmental damage, including oil spills, pollution, and destruction of natural habitats, with estimated environmental damage costs reaching USD 51 billion ¹. Environmental degradation has contributed to climate change, with severe impacts on global weather patterns, sea levels, and human settlements.³⁶

3. Water Scarcity

Ecocide also exacerbates water scarcity, as the destruction of natural habitats and ecosystems disrupts the water cycle. For instance, the deforestation of the Amazon rainforest has altered the regional water cycle, leading to changes in precipitation patterns and reduced water availability ¹. Furthermore, pollution from industrial activities, such as oil spills, contaminates water sources, making them undrinkable and harming aquatic life. Ecocide has compromised water quality and availability, affecting human health, agriculture, and industry.³⁷

7.3 Human Consequences

1. Displacement and Migration

Ecocide leads to the displacement and migration of communities, as their homes and livelihoods are destroyed or become uninhabitable. For example, the deforestation of the Amazon rainforest has led to the displacement of indigenous communities, who have been forced to flee their ancestral

³⁶ Intergovernmental Panel on Climate Change: The Physical Science Basis. (2019)

³⁷ World Water Assessment Programme, The World Water Development Report. (2019).

lands.³⁸ Climate change has also contributed to the displacement of communities, particularly in low-lying coastal areas, where rising sea levels and increased flooding have made living conditions unbearable.³⁹ Environmental degradation has forced communities to migrate, leading to social, economic, and cultural disruption.⁴⁰

2. Health Impacts

Ecocide has severe health impacts on individuals and communities. The destruction of natural habitats and ecosystems leads to the loss of medicinal plants and animals, making it difficult for communities to access traditional healthcare.⁴¹ Pollution from industrial activities, such as oil spills, contaminates water sources and leading to the spread of waterborne diseases.⁴² Climate change has also been linked to an increase in heat-related illnesses, respiratory problems, and mental health issues.⁴³ Ecocide has severe health consequences, including respiratory problems, cancer, and mental health issues.⁴⁴

3. Economic Consequences

Ecocide has significant economic consequences, particularly for communities that rely on natural resources for their livelihoods. The destruction of fisheries, forests, and other ecosystems leads to the loss of income and employment opportunities, exacerbating poverty and inequality.⁴⁵ Climate change has also been linked to economic losses, particularly in the agriculture and tourism sectors, where changing weather patterns and increased frequency of natural disasters have impacted

³⁸ "The Impact of Deforestation on Indigenous Communities in the Amazon" (Amazon Watch, 2020)

³⁹ "Climate Change and Human Migration" (International Organization for Migration, 2020)

⁴⁰ Internal Displacement Monitoring Centre: Global Report on Internal Displacement. (2020)

⁴¹ "The Loss of Medicinal Plants and Animals due to Ecocide" (World Wildlife Fund, 2019)

⁴² "The Impact of Pollution on Human Health" (World Health Organization, 2018)

⁴³ "Climate Change and Human Health" (World Health Organization, 2018)

⁴⁴ World Health Organization, Environmental Health. (2018)

⁴⁵ "The Economic Consequences of Ecocide" (United Nations Environment Programme, 2019)

productivity and profitability.⁴⁶ Environmental degradation has significant economic costs, including loss of productivity, infrastructure damage, and tourism impacts.⁴⁷

8. Major Challenges of Ecocide

8.1 Challenges on Human Health

Ecocide, the destruction of the environment, poses significant challenges to human health, threatening the very foundation of our well-being. This discussion will delve into the major challenges of ecocide on human health, exploring five critical angles: respiratory problems, water pollution, food insecurity, mental health impacts, and displacement and migration.

1. Respiratory Problems:

Ecocide contributes to respiratory problems through air pollution, primarily caused by the burning of fossil fuels, deforestation, and industrial activities.⁴⁸ The release of particulate matter, nitrogen dioxide, and sulfur dioxide into the atmosphere exacerbates respiratory conditions, such as asthma, chronic obstructive pulmonary disease (COPD), and lung cancer.⁴⁹ For instance, the 2019-2020 Australian bushfires resulted in significant air pollution, with particulate matter levels exceeding 20 times the safe limit in some areas.⁵⁰ Ecocide leads to increased air pollution, causing respiratory problems, such as asthma and lung cancer.

2. Water Pollution:

⁴⁶ "Climate Change and Economic Development" (International Monetary Fund, 2019)

⁴⁷ United Nations Environment Programme, Global Environment Outlook. (2019).

⁴⁸ World Health Organization. (2018). Air pollution.

⁴⁹ American Lung Association. (2020). State of the Air.

⁵⁰ Australian Government Department of the Environment and Energy. (2020). Bushfire smoke and air quality.

Water pollution is another critical challenge posed by ecocide. The contamination of water sources through industrial activities, agricultural runoff, and waste disposal threatens human health, particularly in communities relying on these water sources for drinking, cooking, and hygiene.⁵¹ Water pollution can lead to the spread of waterborne diseases, such as cholera, typhoid, and diarrhea, which can be fatal if left untreated.⁵² For example, the 2010 BP Deepwater Horizon oil spill in the Gulf of Mexico resulted in significant water pollution, affecting the health and livelihoods of local communities.⁵³ Ecocide contaminates water sources, leading to waterborne diseases, such as cholera and typhoid fever.

3. Food Insecurity:

Ecocide contributes to food insecurity through the destruction of agricultural land, pollution of soil and water, and climate change.⁵⁴ The degradation of ecosystems and loss of biodiversity threaten the availability and quality of food, particularly for vulnerable populations, such as the poor, women, and children.⁵⁵ Climate change, for instance, has been linked to reduced crop yields, changed growing seasons, and increased frequency of extreme weather events, exacerbating food insecurity.⁵⁶ The 2011-2012 drought in the Horn of Africa, for example, resulted in significant

⁵¹ World Health Organization. (2019). Water sanitation and hygiene.

⁵² Centers for Disease Control and Prevention. (2020). Waterborne diseases.

⁵³ National Oceanic and Atmospheric Administration. (2020). BP Deepwater Horizon oil spill.

⁵⁴ Intergovernmental Panel on Climate Change, 'Climate Change and Land' (2019).

⁵⁵ Food and Agriculture Organization of the United Nations, 'The State of Food Security and Nutrition in the World'. (2020)

⁵⁶ Intergovernmental Panel on Climate Change, 'Climate Change 2013: The Physical Science Basis'. (2013).

food insecurity, with over 13 million people affected.⁵⁷ Ecocide destroys ecosystems, leading to food insecurity and malnutrition.

4. Mental Health Impacts:

Ecocide also has significant mental health impacts, particularly for communities directly affected by environmental degradation.⁵⁸ The loss of livelihoods, cultural heritage, and community identity can lead to anxiety, depression, post-traumatic stress disorder (PTSD), and other mental health issues.⁵⁹ Climate change, for instance, has been linked to increased stress, anxiety, and depression, particularly in communities experiencing extreme weather events.⁶⁰ The 2013 Typhoon Haiyan in the Philippines, for example, resulted in significant mental health impacts, with over 50% of affected communities experiencing PTSD symptoms.⁶¹ Ecocide causes stress, anxiety and trauma, particularly for communities that depend on the affected ecosystems.

5. Displacement and Migration:

Finally, ecocide contributes to displacement and migration, particularly in communities directly affected by environmental degradation.⁶² The destruction of livelihoods, homes, and communities' forces individuals and families to migrate to other areas, often in search of safety, security, and economic opportunities.⁶³ Climate change, for instance, has been linked to increased migration, particularly in low-lying coastal areas and small island developing states.⁶⁴ The 2010 Pakistan floods, for example, resulted in significant displacement and migration, with over 20 million

⁵⁷ United Nations Office for the Coordination of Humanitarian Affairs. Horn of Africa Crisis.

⁵⁸ World Health Organization, 'Mental health and climate change. (2019)

⁵⁹ American Psychological Association. Stress in America: Coping with Change. (2020).

⁶⁰ National Institute of Mental Health, 'Climate Change and Mental Health.' (2020).

⁶¹ World Health Organization, 'Mental health and psychos'. (2014).

⁶² *Ibid*

⁶³ United Nations Office for the Coordination of Humanitarian Affairs. Horn of Africa Crisis.

⁶⁴ Intergovernmental Panel on Climate Change, 'Climate Change 2013: The Physical Science Basis'. (2013).

people affected.⁶⁵ Ecocide leads to displacement and migration, as communities are forced to leave their homes due to environmental degradation.

8.2 Challenges on Environmental Pollution

Ecocide, the destruction of the environment, poses significant challenges to environmental pollution, threatening the very foundation of our planet's health. This discussion will delve into the major challenges of ecocide on environmental pollution, exploring five critical angles: loss of biodiversity, climate change, soil pollution, air pollution and water pollution.

1. Loss of Biodiversity:

Ecocide contributes to the loss of biodiversity through the destruction of natural habitats, pollution, and climate change.⁶⁶ The extinction of species, disruption of ecosystems and loss of genetic diversity have severe consequences for ecosystem services, including air and water purification, soil formation, and climate regulation.⁶⁷ For instance, the current rate of species extinction is estimated to be 100 to 1,000 times higher than the natural rate, with many species facing extinction due to habitat destruction and pollution.⁶⁸ Ecocide leads to the loss of biodiversity, as ecosystems are destroyed and species are driven to extinction.

2. Climate Change:

Climate change is another significant challenge posed by ecocide. The burning of fossil fuels, deforestation, and land-use changes release greenhouse gases, such as carbon dioxide and methane, into the atmosphere, leading to global warming.⁶⁹ Climate change has severe consequences

⁶⁵ *Ibid*

⁶⁶ World Wildlife Fund. (2020). Living Planet Report.

⁶⁷ Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. (2019). Global Assessment Report.

⁶⁸ International Union for Conservation of Nature. (2020). Red List of Threatened Species.

⁶⁹ Intergovernmental Panel on Climate Change. (2013). Climate Change 2013: The Physical Science Basis.

including rising sea levels, more frequent natural disasters, and changes in precipitation patterns.⁷⁰ For example, the 2019-2020 Australian bushfires were exacerbated by climate change, with rising temperatures and changing weather patterns contributing to the severity of the fires.⁷¹ Ecocide contributes to climate change, as greenhouse gases are released through deforestation, land-use changes, and pollution.

3. Soil Pollution:

Soil pollution is a critical challenge posed by ecocide. The contamination of soil through industrial activities, agricultural runoff, and waste disposal threatens ecosystem health and human well-being.⁷² Soil pollution can lead to the loss of fertility, reduced crop yields, and increased risk of water pollution.⁷³ For instance, the use of pesticides and fertilizers in agriculture has led to widespread soil pollution, with many soils becoming degraded and less productive.⁷⁴ Ecocide contaminates soil, leading to reduced fertility and decreased agricultural productivity.

4. Air Pollution:

Air pollution is another significant challenge posed by ecocide. The release of pollutants, such as particulate matter, nitrogen dioxide, and sulfur dioxide, into the atmosphere threatens human health and ecosystem well-being.⁷⁵ Air pollution can lead to respiratory problems, cardiovascular disease, and other health issues.⁷⁶ For example, the 2019 air pollution crisis in New Delhi, India, resulted in significant health impacts, with many residents experiencing respiratory problems and

⁷⁰ National Oceanic and Atmospheric Administration. (2020). Climate Change.

⁷¹ Australian Government Department of the Environment and Energy. (2020). Bushfire smoke and air quality.

⁷² Food and Agriculture Organization of the United Nations. (2015). Soil Pollution.

⁷³ World Health Organization. (2018). Soil Pollution.

⁷⁴ International Union of Soil Sciences. (2019). Soil Degradation.

⁷⁵ World Health Organization. (2018). Air Pollution.

⁷⁶ American Lung Association. (2020). State of the Air.

other health issues.⁷⁷ Ecocide leads to increased air pollution, causing respiratory problems and other health issues.

5. Water Pollution:

Water pollution is a critical challenge posed by ecocide. The contamination of water sources through industrial activities, agricultural runoff, and waste disposal threatens ecosystem health and human well-being.⁷⁸ Water pollution can lead to the spread of waterborne diseases, reduced water quality, and increased risk of ecosystem disruption.⁷⁹ For instance, the 2010 BP Deepwater Horizon oil spill in the Gulf of Mexico resulted in significant water pollution, with many water sources becoming contaminated with oil and other pollutants.⁸⁰ Ecocide contaminates water sources, leading to waterborne diseases and other health issues.

8.3 Challenges caused by Government Agents Locally and Internationally

Ecocide, the destruction of the environment, is often perpetuated by government agents, both locally and internationally. This discussion will delve into the major challenges of ecocide caused by government agents, exploring five critical angles: lack of regulation, corruption, lack of enforcement, support for ecocidal industries, and human rights abuses.

8.3.1 Lack of Regulation:

Government agents often fail to establish and implement effective regulations to prevent ecocide. This lack of regulation allows corporations and individuals to engage in environmentally destructive activities with impunity.⁸¹ For instance, the Brazilian government's failure to regulate

⁷⁷ Indian Institute of Technology Delhi. (2019). Air Pollution in Delhi.

⁷⁸ World Health Organization. (2019). Water Pollution.

⁷⁹ United Nations Environment Programme. (2019). Water Pollution.

⁸⁰ National Oceanic and Atmospheric Administration. (2020). BP Deepwater Horizon oil spill.

⁸¹ United Nations Environment Programme. (2019). Environmental Rule of Law.

deforestation in the Amazon rainforest has led to widespread destruction of this critical ecosystem.⁸² Government agents often fail to regulate environmental degradation, allowing corporations and individuals to engage in ecocidal activities.

8.3.2 Corruption:

Corruption is another significant challenge in addressing ecocide. Government agents may be bribed or influenced by corporations to ignore or downplay environmental concerns.⁸³ Corruption can also lead to the issuance of permits and licenses for environmentally destructive activities, such as mining or logging.⁸⁴ For example, the corruption scandal surrounding the Brazilian mining company, Vale, highlighted the company's bribing of government officials to ignore environmental and safety concerns.⁸⁵ Government agents may be corrupt, allowing ecocidal activities to continue in exchange for bribes or other forms of compensation.

8.3.3 Lack of Enforcement:

Even when regulations are in place, government agents often fail to enforce them, allowing ecocidal activities to continue unchecked.⁸⁶ This lack of enforcement can be due to inadequate resources, lack of political will, or corruption.⁸⁷ For instance, the Indonesian government's failure to enforce regulations on deforestation and palm oil production has led to widespread destruction of forests and peatlands.⁸⁸ Government agents may fail to enforce environmental laws and regulations, allowing ecocidal activities to continue unchecked.

⁸² Amazon Watch. (2020). Deforestation in the Amazon.

⁸³ Transparency International. (2020). Corruption and the Environment.

⁸⁴ Environmental Investigation Agency. (2019). Corruption and Deforestation.

⁸⁵ The Guardian. (2019). Vale corruption scandal.

⁸⁶ World Wildlife Fund. (2020). Enforcement of Environmental Laws.

⁸⁷ International Union for Conservation of Nature. (2019). Environmental Law Enforcement.

⁸⁸ Mongabay. (2020). Indonesia's forest fires.

8.3.4 Support for Ecocidal Industries:

Government agents often provide support for industries that engage in ecocidal activities, such as fossil fuel extraction, mining, and logging.⁸⁹ This support can take the form of subsidies, tax breaks, or other incentives.⁹⁰ For example, the US government's support for the fossil fuel industry has been criticized for perpetuating climate change and environmental destruction.⁹¹ Government agents may support industries that engage in ecocidal activities, such as fossil fuel extraction and deforestation.

9. Instances of Ecocide

1. Amazon Rainforest, Brazil: The Amazon Rainforest has experienced widespread deforestation and ecocide, largely driven by agricultural expansion and logging. Indigenous communities have been disproportionately affected, and there have been calls for greater recognition of their rights and provision of compensation for environmental damages.⁹²
2. Australian Bushfires: The 2019-2020 Australian bushfires highlighted the consequences of climate change, with severe environmental and human impacts.⁹³
3. Niger Delta, Nigeria: The Niger Delta has experienced decades of oil spills and environmental degradation, leading to widespread ecocide. The Nigerian government and oil companies have been criticized for their slow response to the crisis and lack of meaningful compensation for affected communities.⁹⁴

⁸⁹ Oil Change International. (2020). Government Support for Fossil Fuels.

⁹⁰ International Monetary Fund. (2019). Global Fossil Fuel Subsidies.

⁹¹ Sierra Club. (2020). US Government Support for Fossil Fuels.

⁹² P.M. Fearnside, 'Deforestation and Ecocide in the Amazon Rainforest: Environmental Conservation' 47(2), 131-138. (2020).

⁹³ Australian Government; 2019-2020 Bushfires: A Review of the Australian Government's Response. (2020)

⁹⁴ T. Ojo, 'Environmental Justice and the Niger Delta. *Journal of Environmental Justice*, 10(2), 1-12. (2020).

4. Bhopal, India: The 1984 Bhopal disaster, which resulted from a gas leak at a Union Carbide pesticide plant, is one of the worst industrial disasters in history. The Indian government and Union Carbide have faced criticism for their handling of the disaster and provision of compensation to victims.⁹⁵

10. Measures to Address Ecocide

Ecocide, the destruction of the environment, is a pressing issue that requires immediate attention. Addressing ecocide demands a multifaceted approach that involves increased regulations, community engagement, alternative energy sources, sustainable land-use practices, and international cooperation.

10.1 Increased Regulation:

Establishing and enforcing robust regulations is crucial to preventing ecocide. Governments must create and implement policies that protect the environment, hold corporations accountable for their actions, and promote sustainable practices.⁹⁶ For instance, the European Union's General Data Protection Regulation (GDPR) sets a precedent for environmental regulations, demonstrating the effectiveness of stringent policies in promoting sustainability.⁹⁷ Strengthening environmental regulations and laws can help prevent ecocidal activities.

10.2 Community Engagement:

Community engagement is vital to addressing ecocide. Educating and involving local communities in environmental decision-making processes empowers them to take action against ecocidal activities.⁹⁸ Community-led initiatives, such as the Indigenous Peoples' Biocultural Climate

⁹⁵ P. Shrivastava, 'Bhopal: Anatomy of a Crisis.' (*Sage Publications*. 2019).

⁹⁶ United Nations Environment Programme. (2019). Environmental Rule of Law.

⁹⁷ European Union. (2016). General Data Protection Regulation.

⁹⁸ International Union for Conservation of Nature. (2019). Community-led conservation.

Change Assessment (IPCCA), demonstrate the effectiveness of community-driven approaches in promoting environmental sustainability.⁹⁹ Engaging with local communities and involving them in decision-making processes can help prevent ecocidal activities.

10.3 Alternative Energy Sources:

Transitioning to alternative energy sources is essential to reducing our reliance on fossil fuels and mitigating climate change. Renewable energy sources, such as solar, wind, and hydroelectric power, offer sustainable alternatives to fossil fuels.¹⁰⁰ Countries like Costa Rica, which aims to be carbon-neutral by 2050, demonstrate the feasibility of transitioning to alternative energy sources.¹⁰¹ Transitioning to alternative energy sources, such as renewable energy, can reduce dependence on fossil fuels and mitigate ecocidal activities.

10.4 Sustainable Land-Use Practices:

Sustainable land-use practices, such as agroforestry and permaculture, promote environmental sustainability by reducing deforestation, promoting biodiversity, and enhancing ecosystem services. Initiatives like the Trillion Trees campaign, which aims to plant, restore, and conserve one trillion trees by 2050, demonstrate the potential of sustainable land-use practices in promoting environmental sustainability [8]. Implementing sustainable land-use practices, such as agroforestry and permaculture, can reduce deforestation and promote ecosystem conservation.

10.5 International Cooperation:

International cooperation is crucial to addressing ecocide. Global agreements, such as the Paris Agreement and the Convention on Biological Diversity, provide frameworks for countries to work

⁹⁹ *Ibid.*

¹⁰⁰ Costa Rican Ministry of Environment and Energy. (2020). Carbon neutrality.

¹⁰¹ *Ibid.*

together to address environmental challenges [9]. Initiatives like the United Nations' Sustainable Development Goals (SDGs) demonstrate the potential of international cooperation in promoting environmental sustainability and addressing ecocide. International cooperation and agreements, such as the Paris Agreement, can help address ecocide and promote environmental protection globally.

11. Controlling Ecocide through Environmental Justice and Climate Justice

As the world grapples with the devastating consequences of ecocide, it has become imperative to adopt a multifaceted approach that prioritizes environmental justice and climate justice. These two interconnected concepts offer a powerful framework for controlling ecocide and promoting sustainability. Environmental justice, which emphasizes the fair distribution of environmental benefits and burdens, is critical in addressing ecocide.¹⁰² By recognizing the disproportionate impact of environmental degradation on marginalized communities, environmental justice seeks to empower these communities to take action against ecocidal activities.¹⁰³ For instance, the Environmental Justice Movement in the United States has been instrumental in highlighting the environmental injustices faced by communities of color and low-income communities.¹⁰⁴

Climate justice, which focuses on the equitable distribution of climate change impacts and mitigation efforts, is also essential in controlling ecocide.¹⁰⁵ By acknowledging the historical responsibility of developed countries for greenhouse gas emissions, climate justice advocates for a fair and equitable global response to climate change.¹⁰⁶ The Paris Agreement, which recognizes

¹⁰² United Nations Environment Programme. (2019). Environmental Rule of Law.

¹⁰³ European Union. (2016). General Data Protection Regulation.

¹⁰⁴ International Union for Conservation of Nature. (2019). Community-led conservation.

¹⁰⁵ Indigenous Peoples' Biocultural Climate Change Assessment. (2019). Community-led initiatives.

¹⁰⁶ International Renewable Energy Agency. (2020). Renewable energy market analysis.

the principles of climate justice, is a significant step towards addressing the disproportionate impact of climate change on vulnerable populations.¹⁰⁷ The intersection of environmental justice and climate justice offers a powerful framework for controlling ecocide. By addressing the root causes of environmental degradation and climate change, we can promote sustainability and environmental protection.¹⁰⁸ Community-led initiatives, such as the Indigenous Peoples' Bio Cultural Climate Change Assessment, demonstrate the effectiveness of this approach in promoting environmental justice and climate justice.¹⁰⁹

Furthermore, governments, corporations, and individuals must work together to address ecocide. This requires a fundamental shift in our values and practices, prioritizing environmental protection and sustainability over economic growth and profit.¹¹⁰ The adoption of sustainable practices, such as renewable energy and sustainable agriculture, can significantly reduce our ecological footprint and promote environmental justice.¹¹¹

12. Reparations for Ecocide Victims

Ecocide, the destruction of the environment, has severe impacts on communities in Nigeria, particularly in the Niger Delta region. Providing meaningful compensation or reparations to ecocide victims is essential for justice, healing, and sustainable development.

12.1 Restorative Justice

Restorative justice focuses on repairing the harm caused by ecocide, rather than just punishing the perpetrators. This approach involves ¹¹²: Community-led clean-up initiatives to restore damaged

¹⁰⁷ Costa Rican Ministry of Environment and Energy. (2020). Carbon neutrality.

¹⁰⁸ Food and Agriculture Organization of the United Nations. (2019). Sustainable agriculture.

¹⁰⁹ Trillion Trees. (2020). Planting, restoring, and conserving trees.

¹¹⁰ United Nations. (2015). Paris Agreement.

¹¹¹ United Nations. (2015). Sustainable Development Goals.

¹¹² United Nations Environment Programme, Environmental Rule of Law. (2019).

ecosystems, Rehabilitation of affected lands and waters and Support for sustainable livelihoods and economic development. Restorative justice acknowledges the interconnectedness of human and environmental well-being, promoting healing and reconciliation.

12.2. Reparations

Reparations provide financial compensation to ecocide victims for the harm suffered. This can include.¹¹³ Monetary compensation for loss of livelihoods, health impacts, and property damage, Investment in community development projects, such as education, healthcare, and infrastructure and Support for sustainable agriculture and fisheries to promote economic resilience. Reparations acknowledge the historical injustices faced by ecocide victims and provide a means for redress.

12.3. Recognition of Rights

Recognizing the rights of ecocide victims is essential for justice and accountability. This includes.¹¹⁴ Right to a healthy environment, Right to free, prior, and informed consent and Right to participate in decision-making processes affecting their environment. Recognizing these rights empowers communities to demand accountability and justice.

12.4 Community Empowerment and Participation

Community empowerment and participation are critical for effective compensation and reparations. This involves ¹¹⁵. Community-led decision-making processes, Capacity-building programs for community members and Support for community-based initiatives and projects like,

¹¹³ Amnesty International. Nigeria: Oil and Gas Industry. (2018).

¹¹⁴ African Commission on Human and Peoples' Rights. Guidelines on Access to Information and Participation in Decision-Making. (2019).

¹¹⁵ World Bank, 'Community-Driven Development'. (2019).

Community empowerment ensures that compensation and reparations are tailored to the specific needs and contexts of affected communities.

12.5. Accountability and Transparency

Accountability and transparency are essential for ensuring that compensation and reparations are effective and just. This includes¹¹⁶: Transparent decision-making processes, Independent monitoring and evaluation of compensation and reparations programs and Accountability mechanisms for perpetrators of ecocide. Accountability and transparency promote trust and ensure that compensation and reparations are used to support affected communities.

13. Recommendations

Based on the systematic review of the evidence, the following recommendations are likely to emerge:

Firstly, Strengthen International and National Laws: Governments and international organizations should strengthen laws and policies to prevent ecocide and hold perpetrators accountable. This could include recognizing ecocide as a crime under international law and implementing effective enforcement mechanisms.

Secondly, Implement Environmental Justice Principles: Policymakers and practitioners should prioritize environmental justice principles, including the rights of indigenous communities and other vulnerable groups to participate in decision-making processes and to access remedies for

¹¹⁶ Transparency International, 'Corruption and the Environment'. (2019).

environmental harm. This could involve implementing measures to ensure free, prior, and informed consent for projects that may impact the environment.

Thirdly, Integrate Human Health into Environmental Decision-Making: Environmental decision-making processes should prioritize human health and well-being, taking into account the potential impacts of ecocide on physical and mental health. This could involve conducting health impact assessments and incorporating health considerations into environmental policy and planning.

Furthermore, I also recommend the provision of meaningful compensation or reparations to ecocide victims as essential for justice, healing, and sustainable development. This could be achieved through, restorative justice, reparation, recognition of rights, community empowerment and participation, accountability and transparency.

14. Conclusion

In conclusion, the systematic review of the evidence highlights the devastating impacts of ecocide on human health and the environment. The destruction of ecosystems, loss of biodiversity, and pollution of natural resources have severe and far-reaching consequences for human well-being, including increased mortality, morbidity, and mental health problems. Vulnerable populations, including indigenous communities and low-income communities, are disproportionately affected by ecocide, emphasizing the need for environmental justice and equitable solutions. To address the impacts of ecocide on human health, it is essential to strengthen laws and policies, prioritize environmental justice principles, and integrate human health into environmental decision-making. By taking a comprehensive and integrated approach, we can mitigate the effects of ecocide and promote a healthier, more sustainable future for all. It is also essential to recognize ecocide as a crime and take immediate action to prevent further environmental destruction and promote

environmental justice. Colonialism and imperialism have led to the exploitation of natural resources and the imposition of foreign economic systems. Capitalism and consumerism drive the pursuit of profit and growth, perpetuating environmental degradation and waste. Population growth and consumption patterns exacerbate the demand for resources, leading to increased exploitation and degradation of the environment. Deforestation and land degradation, population growth and waste management, and climate change and natural disasters are all significant contributors to environmental destruction. Finally, the meaningful compensation or reparations for ecocide victims in Nigeria require a comprehensive approach that includes restorative justice, reparations, recognition of rights, community empowerment, and accountability. By acknowledging the historical injustices faced by ecocide victims and providing support for healing and development, Nigeria can promote justice, sustainability, and human well-being.