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Deforestation: Mapping the Impact on Wildlife

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ABSTRACT

In the era of globalization, countries are making significant progress for the benefit of their populations. Governments are taking necessary steps to advance and provide facilities for the comfort of their citizens. However, amidst this progress, the welfare of wildlife is often overlooked. From a legal standpoint, wildlife lacks rights against governmental actions, and there is no provision for them to appeal against decisions, as they are not recognized as human beings.

This article explores the multifaceted impact of deforestation on wildlife, emphasizing the profound consequences of habitat loss, disruption of food chains, and the subsequent decline in biodiversity. As forests are systematically cut down, the intricate ecosystems that support various species face severe challenges, leading to number declines and, in some cases, species extinction. The article underscores the interconnectedness of ecosystems and the far-reaching implications of deforestation on climate change. In response to these challenges, conservation strategies such as sustainable forestry practices, habitat protection, and the creation of wildlife corridors are discussed. In conclusion, the article calls for heightened awareness and collective action to preserve biodiversity and foster a harmonious coexistence between human activities and the natural world.

Introduction

Deforestation, the extensive clearing of forests for various purposes, has significant implications for the delicate equilibrium of ecosystems. One of the most alarming outcomes is its severe impact on wildlife. Despite widespread recognition of the effects of deforestation on climate change and ecosystems, the profound consequences for wildlife often receive less attention in public discussions. As trees are cut down and habitats destroyed, numerous species confront displacement, loss of shelter, and disruptions to their natural behaviors. As the worldwide demand for timber, agriculture, and urban expansion grows, extensive areas of invaluable forest ecosystems are undergoing rapid conversion or depletion. This process not only alters the physical appearance of the land but also brings about significant and frequently irreversible consequences for wildlife. Annually, approximately 13 million hectares of forest are converted

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for alternative land uses (FAO, 2010), resulting in losses in biodiversity, soil erosion, and substantial carbon dioxide emissions.[1]

Deforestation plays a crucial role in the heightened interactions between wildlife and humans. In India, the clearing of the Kyasanur forest in 1958 led to the emergence of a new disease caused by a tick-borne flavivirus named after the recently deforested area. This occurrence resulted from the conversion of the forest land, later used for cattle grazing.[2] According to the UN Food and Agricultural Organization (FAO), deforestation is described as "the transformation of forests into alternative land uses or the sustained decrease of tree canopy cover below the 10% threshold."[3]

The primary outcome of deforestation is the loss of habitats, affecting diverse wildlife species dependent on specific environments for their existence. Birds, mammals, insects, and amphibians face the imminent risk of losing their habitats and breeding grounds, leading to declining populations and, in certain instances, the brink of extinction. As natural landscapes give way to agricultural fields or urban developments, the rich variety of flora and fauna that once flourished is supplanted by a uniformity that poses a threat to biodiversity. The intricate interconnection between forests and wildlife plays a crucial role in maintaining the equilibrium and variety of ecosystems. Forests function as intricate habitats, offering shelter, nourishment, and breeding spaces for a diverse range of plant and animal species.

However, the relentless pace of deforestation disturbs these ecosystems, triggering a chain reaction of consequences on biodiversity, climate, and the intricate interconnectedness of life. The disruption of food webs in these environments is another significant consequence of deforestation's impact on wildlife. Trees and plants play a crucial role in upholding intricate food webs, as numerous species depend on particular plants, fruits, or insects for their sustenance. When these resources vanish due to deforestation, the delicate equilibrium of predator-prey dynamics is disturbed, resulting in malnourishment, diminished reproductive rates, and ultimately endangering the survival of diverse species.

In this context, it is essential to investigate and comprehend the various impacts of deforestation on wildlife. Beyond the direct loss of trees, deforestation leads to habitat destruction, fragmentation, alterations in population dynamics, and heightened conflicts between humans and wildlife. Understanding these effects is vital not only for acknowledging the pressing need for conservation but also for devising inclusive strategies that harmonize human requirements with the crucial goal of safeguarding Earth's diverse ecosystem.

In India, the responsibility to conserve wildlife lies with both federal and state governments, and both can pass laws relating to biodiversity conservation. Initially, the Wildlife Protection Act of 1972 and the Forest (Conservation) Act of 1980 were passed for the protection of wildlife. However, falling short of their desired objective, India's Biological Diversity Act of 2002 was passed to establish a three-tier implementation mechanism, where the State Biodiversity Boards (SBB) are responsible for achieving national biodiversity targets with support from the National Biodiversity Authority at the federal level and the district development and biodiversity management committees at the grassroots level.[4]

Taking the example of the capital city, New Delhi, it has a forest cover of 195 square kilometers, representing 13.15% of its total geographical area of 1483 square kilometers. However, only 103 square kilometers of this forest cover is officially marked or recorded by the government, according to the India State of Forest Report 2021. Recent data indicates that 63.30 hectares of forest land were diverted for urban development purposes in the capital city in 2022-23, an increase from 21.75 hectares in 2021-22.

Additionally, it is reported that 384.38 hectares, equivalent to 3.84 square kilometers, of forest land in the capital is currently under encroachment.[5] According to experts, "Delhi has already lost most of its 'true forests,' and whatever patches are left are 'infested by invasive species.'" C R Babu, professor emeritus and head of the Centre for Environmental Management of Degraded Ecosystems at Delhi University, conferred, "Besides the biodiversity parks, Delhi doesn't have forests. A true forest should have a typical structure, like a top tree cover with canopy-defining trees, medium-height trees and scrubs, or ground-based vegetation. Most of such forests have already disappeared

[1]Olivier Damette and Philippe Delacote, "Unsustainable timber harvesting, deforestation and the role of certification" Ecological Economics vol.70, Issue 6, April2011, pp 1211-1219.

[2]Taylor D. Seeing the forests for more than the trees. *Environ. Health Perspect.* 1997;105:1186–1191. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7094111/#bib0025

[3]Rima Kumari, Ayan Banerjee, Rahul Kumar, Amit Kumar &Ors. "Deforestation in India: Consequences and Sustainable Solutions" Forest Degradation Around the World

[4]Abhishek Chaudhary et al., "Subnational Assessment of threats to Indian Biodiversity and habitat restoration opportunities" 2022 Environ. Res. Lett. 17 054022.

[5]PTI, "Over 100hectares of forest land diverted for development work in Delhi in 15 years: Govt data" 8 August, 2023, The Hindu.

from Delhi, barring a few patches, which are infested with foreign vilayati kikar or Prosopis juliflora."[6]

In this discussion, we delve into the various dimensions of how deforestation affects wildlife. From the vulnerability of specialized species to the broader consequences for biodiversity, climate, and the delicate balance of ecosystems, we aim to shed light on the challenges and potential solutions that can guide us toward a more sustainable coexistence with the natural world.

Causes Of Deforestation

Unprecedented economic development, no doubt offers several welfare and well-being opportunities but in turn puts pressure on natural resources and leads to acquisition of forest land for alternative development purposes. One of the major causes of deforestation is the high demand for food products due to the rapid increase in population. As the population grows, so does the demand for food, putting pressure on clearing more land areas for agriculture. Increasing population demands excessive use of forest products for purposes such as firewood, wood products, or personal needs. Logging impacts the environment in various ways, including changes in species composition, forest structure, and soil nutrient balance.[7]

Yet another major factor witnessed in India is excessive urbanization. The expansion of cities requires more land for constructing roads and infrastructure to accommodate the growing population. As urban areas expand, they demand more resources to sustain their populations, leading to deforestation directly through land conversion and indirectly by increasing pressure on forests to provide resources.[8] To support increasing demographics, there is requires development of large-scale infrastructure projects, like dams and reservoirs. These, in turn, result in deforestation and remain prone to flooding of large forested areas. In addition, mining is another significant cause of deforestation, often requiring clearing vast forested areas to access valuable mineral and metal deposits. The extraction process involves removing vegetation and altering the natural landscape, while infrastructure development for mining operations further impacts ecosystems and biodiversity. Mining also threatens soil fertility and carbon sequestration, affecting both primary and secondary forests.[9]

Effects On Wildlife

Deforestation impacts different facets of life, which in turn has long term implications. Major factors include the following:

HABITAT LOSS: Forests provide home to a variety of species; therefore, deforestation results in the destruction of natural habitats where many species reside. This deprivation of natural surroundings can lead to population shrinkage or even extinction, especially for species with specific habitat requirements. Furthermore, the routes of migratory species that rely on large, continuous habitats also gets diverted. Migratory species often depend on specific habitats at different stages of their journey, and the loss of these areas can hinder their ability to complete their life cycles.

DISRUPTION OF FOOD CHAINS: A food chain is a sequence of organisms, each dependent on the next as a source of food. Many species depend on a complex web of interactions within their ecosystems. The removal of key species or changes in the availability of resources due to habitat loss can have ripple effects throughout the food chain, affecting predator-prey relationships and overall ecosystem stability. When disruptions occur, whether due to natural events or human activities, it can lead to a cascade of effects throughout the ecosystem.

LOSS OF BIODIVERSITY: Biodiversity is considered the greatest contributor to Earth's ecosystems. The Convention on Biological Diversity defines biodiversity "as the variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems, and the ecological complexes of which they are part. This includes diversity within species, between species, and of ecosystems."[10] The devastation of forests leads to the loss of biodiversity, as many species may not survive or adapt to the changes. Some species may face local extinction, and the overall biodiversity of the affected area decreases.

CLIMATE CHANGE: Forests play an important role in balancing the ecosystem. They act as carbon sinks because they capture carbon dioxide from the atmosphere. In the situation of deforestation, when trees are cut down

[6]Kushagra Dixit, "Delhi's forest cover lost for first time in a decade" Jan.14,2022., Times of India. https://timesofindia.indiatimes.com/city/delhi/forest-cover-lost-for-1st-time-in-a-decade/articleshow/88885347.cms last visited 17 jan.2024.

[7]Johng Marco, "Environmnetal Effects of logging include deforestation" Environment Pollution and Climate Change, vol.5(6) https://www.omicsonline.org/open-access/environmental-effects-of-logging-include-deforestation116462.html#:~:text=Logging%2C%20or%20reducing%20trees%20in,cause%20nutrient%20depletion%20%5B1%5D. accessed 31 January 2024.

[8]https://www.green.earth/blog/top-10-causes-of-deforestation visited 31 January 2024.

[9]https://www.green.earth/blog/top-10-causes-of-deforestation visited 31 January 2024.

[10]Article 2, Convention on Biological Diversity.

or burned, the stored carbon is released back into the atmosphere, leading to climate change. Changes in climate have a devastating impact on wildlife by altering habitats and food availability. Climate change worsens the planet's biodiversity crises, making the environment more deadly for thousands of species.[11] Some species have been reported to adapt to counteract the detrimental effects of climate change by extending or delaying their reproductive timing or by moving to more climatically suitable breeding sites.[12] The distributions of avian species have shifted towards the poles and mountain tops in recent decade as temperatures have risen.[13] Birds are fundamental to the majority of ecosystems; consequently, they are extremely sensitive to changes in ecosystems.[14]

POPULATION DECLINE AND EXTINCTION RISK: With the loss of habitat, many wildlife populations decline or face extinction. Species that are specialized and adapted to specific forest conditions may struggle to survive in altered landscapes. The International Union for Conservation of Nature (IUCN), associated with governments and civil society organizations, has established and released the "Red List of Threatened Species", which provides information on extinction risk and species distribution.[15]

CHANGES IN MIGRATION PATTERNS: Wildlife solely dependent on forests for shelter, food, and breeding may be forced to migrate or face displacement. This can disrupt natural migration patterns and lead to increased competition for resources, especially among migratory species. These species have set their particular routes and places for halts and for food, so if they do not find their food in specific places, the entire ecological balance will be disturbed.

INCREASED HUMAN-WILDLIFE CONFLICT: As wildlife loses its natural habitat, it may come into closer contact with human settlements, leading to conflicts. This can result in harm to humans and wildlife, as well as negative consequences for agriculture. Conflicts between humans and wildlife, such as those with elephants, leopards, sloth bears, and tigers;[16] or human-monkey conflicts in northern India;[17] human- wild pig conflicts[18] etc. have historical roots. Such conflicts often result in illegal hunting and consumption of wild animal meat, posing a high risk of diseases such as trichinellosis, echinococcosis, and taeniosis.[19]

IRREVERSIBLE LOSS: Once habitat is lost, it can be challenging or impossible to restore fully. This is particularly concerning as many species are adapted to specific ecological niches within their habitats, and the destruction of those habitats can lead to irreversible consequences.

Mitigation Strategies

Before it is too late, there is an urgent need to sensitize the governments, people and other stake holders to adopt a holistic approach and initiate policy postures that could mitigate the impending deforestation crisis.

CONSERVATION AND SUSTAINABLE PRACTICES: Concerned authorities and governments should prioritize initiatives that promote sustainable forest activities, such as selective logging and reduced-impact logging. Additionally, regulations should be implemented and enforced to limit deforestation, while promoting responsible land-use practices.

INVEST IN REFORESTATION AND AFFORESTATION: Large-scale reforestation programs should be implemented to restore degraded or lost habitats. Community-based initiatives should also be supported for planting native trees and restoring natural ecosystems.

ENFORCE AND STRENGTHEN LEGAL PROTECTIONS: Efforts to safeguard wildlife should include strengthening law enforcement against illegal log-

[11]The Hindu, "Endangered species list grows by 2000, Climate change is part of the problem" December12, 2023. https://www.thehindu.com/sci-tech/science/endangered-species-list-grows-by-2000-climate-change-is-part-of-the-problem/article67630001.ece last visited 20 January, 2024

[12]Arpit Deomurari, Ajay Sharma & Ors. "Projected Shifts in Bird Distribution in India under Climate Change" *Diversity* **2023**, *15*(3), 404; https://doi.org/10.3390/d15030404 visited: 22 January, 2024.

[13]Lehikoinen, A.; Virkkala, R. North by North-West: Climate Change and Directions of Density Shifts in Birds. *Glob. Change Biol.* **2016**, *22*, 1121–1129.

[14]Trautmann, S. Climate Change Impacts on Bird Species. In *Bird Species: How They Arise, Modify and Vanish*; Tietze, D.T., Ed.; Springer International Publishing: Cham, Switzerland, 2018; pp. 217–234. ISBN 978-3-319-91689-7

[15]Aadhya Jha, Sulekha Tripathi & Ors, "Survey Of Critically Endangered Flora of India" *Journal of Pharmaceutical Negative Results* Vol. 13, Special Issue 10, 2022, pp 3879-3881.

[16]Thomassen J., Linnell J., Skogen K. Final Report From a Joint Indo-Norwegian Project 2007–2011. NINA Report 736; 2011. Wildlife-Human Interactions: From Conflict to Coexistence in Sustainable Landscapes. 83 pp

[17]Distefano E. SARD Initiative Report, FAO; Rome: 2005. Human-wildlife Conflict Worldwide: A Collection of Case Studies, Analysis of Management Strategies and Good Practices.

[18]Chauhan N.P.S., Barwal K.S., Kumar D. Human–wild pig conflict in selected states in India and mitigation strategies. *Acta Silv. Lign. Hung.* 2009;5:189–197

[19]Singh BB, Gajadhar AA. Role of India's wildlife in the emergence and re-emergence of zoonotic pathogens, risk factors and public health implications. Acta Trop. 2014 Oct;138:67-77. doi: 10.1016/j.actatropica.2014.06.009.

ging, poaching, and other activities contributing to deforestation and harming wildlife. Additionally, measures should be implemented to reduce demand for illegal wildlife products.

PROMOTE SUSTAINABLE FOREST MANAGEMENT: Encouragement should be given to forestry practices prioritizing sustainability, such as selective logging and reduced-impact logging. Furthermore, regulations limiting deforestation and promoting responsible land-use practices should be properly implemented and enforced.

DEVELOP AND IMPLEMENT WILDLIFE CORRIDORS: Establishing and maintaining wildlife protected areas is crucial for preserving critical habitats. Wildlife corridors should be established and protected to facilitate the movement of species between fragmented habitats caused by human activities. Infrastructure projects should be planned and implemented with consideration for maintaining ecological connectivity.

Challenges And Future Directions

Deforestation poses multidimensional challenges that have critical impact on the lives of all living beings. To mitigate it, there is urgent need to address the challenges and charting out robust future plans.

EDUCATE AND RAISE AWARENESS: Local communities must be actively involved in conservation efforts to ensure sustainable practices and address the needs of both humans and wildlife. Educational programs should be initiated to raise awareness about the importance of forests, biodiversity, and the impacts of deforestation. Even this topic should be included in the school curriculums.

SUPPORT RESEARCH AND MONITORING: Increased focus should be placed on research to better understand the specific needs of wildlife and ecosystems affected by deforestation. Understanding the root causes of deforestation and its impacts on wildlife and related ecosystems is crucial. Additionally, implementing monitoring programs can track the impact of conservation efforts and adjust strategies accordingly.

INTERNATIONAL COLLABORATION: Collaboration on initiatives and agreements aimed at protecting global biodiversity and mitigating climate change is essential to address the problem of deforestation effectively.

SOCIO-ECONOMIC FACTORS: Socio-economic factors significantly influence the causes and consequences of deforestation, which consequently affect wildlife. Some of these factors include population growth, poverty, urbanization, property rights, forest rights, conversion of forest land into industrial projects, economic policies, technological advancements, and market demands. Overcoming these challenges is essential for authorities to protect forest cover, wildlife, and endangered species on the verge of extinction.

Conclusion

In conclusion, the impact of deforestation on wildlife is a pressing global concern that demands urgent attention and concerted efforts. As we witness the accelerating loss of forested landscapes, it becomes increasingly evident that the consequences extend far beyond the felling of trees. The intricate web of life, woven through centuries of evolution, faces disruption and, in many cases, irreversible damage.

The decline in biodiversity, loss of habitats, and alterations in population dynamics underscore the urgent need for comprehensive conservation strategies. Reforestation initiatives, sustainable forestry practices, and the establishment of protected areas are integral components of the solution. Moreover, engaging local communities, fostering international cooperation, and promoting corporate responsibility play crucial roles in addressing the root causes of deforestation.

Recognizing the interconnectedness of ecosystems and the delicate balance required for thriving wildlife, it is imperative that we adopt a holistic approach to environmental stewardship. Conservation measures should not only aim to halt deforestation but also strive to restore and rehabilitate ecosystems that have been impacted.

As stewards of this planet, we must acknowledge the responsibility to preserve not only the aesthetic beauty of forests but also the invaluable services they provide. From regulating climate to supporting diverse life forms, forests are essential for the well-being of our planet and future generations. By acknowledging the severity of the issue and taking collective action, we can strive towards a harmonious coexistence with wildlife, ensuring the health and resilience of our global ecosystems for years to come.

References

- Oladimeji Adebayo, "Loss of Biodiversity: The Burgeoning Threat to Human Health" *Annals of Ibadan Postgraduate Medicine,* Jun. 2019. Vol.17(1).
- Auffhammer, Maximilian. 2018. "Quantifying Economic Damages from Climate Change". *Journal of Economic Perspectives* 32(4): 33–52.

- Sharma, E.; Tse-Ring, K.; Chettri, N.; Shrestha, A. IMBC-Plenary Session 1: Climate Change and Its Implications for Mountain Biodiversity in the Himalayas-Trends, Perception and Impacts of Climate Change. In Proceedings of the International Mountain Biodiversity Conference, Kathmandu, Nepal, 16–18 November 2008.
- Shekhar, M.S.; Chand, H.; Kumar, S.; Srinivasan, K.; Ganju, A. Climate-Change Studies in the Western Himalaya. *Ann. Glaciol.* **2010**, *51*, 105–112.
- Rana, S.K., et.al., "200 Years of Research on Himalayan Biodiversity: Trends, Gaps, and Policy Implications" 8 *Front. Ecol. Evol.* 516 (**2021)**.
- Kaul, R.; Kalsi, R.S.; Singh, R.; Basnet, H.; Awan, M.N. Cheer Pheasant (*Catreus wallichii*) and the Conservation Paradox: Importance of Unprotected Areas. *Diversity* **2022**, *14*, 785.
- Nagdeve DA, "Population growth and environmental degradation in India" *Asian Pacific Journal on Environment and Development,* Vol.14 no.1, pp. 41-63 (2007).
- Bowonder B., "Deforestation in India" 18(3-4) *International Journal of Environmental Studies* 223-236 (1982).
- Gupta A, et.al., "Impact of deforestation on Indian monsoon- A GCM sensitivity study" 9 *Journal of Indian Geophysical Union* 97-104 (2005).
- Chakravarty S, et.al., "Deforestation: Causes, effects and control strategies" *Global Perspectives on Sustainable Forest Management* 3-28 (2012).
- Pandit MK, et.al., "Unreported yet massive deforestation driving loss of endemic biodiversity in Indian Himalaya" 16 *Biodiversity and Conservation* 153-163 (2007).
- Damania R, et.al., "India's forests- Stepping stone or milestone for the poor?" *World Development* (2018) DOI: 10.1016/j.worlddev.2018.11.007
- National Forest Policy (1988), Government of India, New-Delhi.
- Forest Survey of India (FSI), "An Assessment Report on Forest Cover Status of India" *Ministry of Environment and Forest (MoEF),* Government of India (2017).
- Ministry of Environment, Forest and Climate Change, "Forest Conservation" (2019). Retrieved from: http://envfor.nic.in/division/forest-conservation;
- Tyagi N, et.al., "Assessing gender responsiveness of forest policies in India" 92 *Forest Policy and Economics* 160-168 (2018).
- A. *Kothari,* Report on Conservation of Biological Diversity in India, Indian Institute of Public Administration, New Delhi,1993.
- Uma Shanker Singh, "State of Forests in India" *International Journal of Development Research* Vol. 07, Issue 03, pp. 12222-12233 (2017).
- N. Devaraju, et.al.; "Effects of large-scale deforestation on precipitation in the monsoon regions: Remote versus local effects" *PNAS,* vol.112; no.11, pp-3257-3262 (2015).
- Abhishek Lodh, "Stimulated Impact of Desertification and Deforestation on Indian Monsoon Rainfall and Surface Fluxes: RegCM4.0 Simulations" *Journal of Ecosystems and Ecography* Vol.7, Issue 1, pp-1-14 (2017).