



Biodiversity Conservation in Changing Climate- Challenges and Strategies of the Present Wildlife Conservation Management in the Global Scenario, Andhra Pradesh, India

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Abstract:

Wild life refers to those fauna and flora grows and lives in the areas unindicted by human. It includes all domestic and wild organisms like animals, plants, fungi, bacteria and virus. Developing human civilization and over technologies are majorly impact on the wild life conservation. In the present context delves about the strategies related to wild life conservation management in the contemporary environmental crisis (17). It is major important factor for the balancing of ecosystem and the global ecological niche. The major challenges of wild life conservation consent of climatic change impact, habitat destruction and Ecological fragmentation, the threat of illegal wild life trade and poaching, the elemental effects of pollution, the introduction and spread of invasive species, illegal hunting along with indiscriminate anthropogenic activities. After investigation of my study identified the given challenges about the wild life threat: (19)

- Increasing pandemic infections and diseases of the migratory birds and animals.
- Habitat loss and major deforestation at the high biodiversity regions for the development without follow the conservation rules. (Wild life act 1972)
- Natural disasters like droughts, cyclones, earthquakes etc. are major challenge to the present conservation sustainability may be cause to indiscriminate pollution.
- Over hunting and collection of the unique species of flora and fauna for experimental activities and illegal exports.
- Inorganic feticide (Agricultural) and industrial (wastes are causes to the aquatic life.
- Most fauna and flora were affected the life threat by the illegal mining without following the National Green Tribunal rules.
- Environmental changes are majorly affecting on the wild life organism's life style such as Breeding, Flowering, Migration timings and disrupt species life cycles.

Note: The above reasons will not control in the future, it is not only effect to the wild life but also affect the human's feature.

Keywords: Wildlife conservation, biodiversity, habitat loss, climate change, ecological balance

1. Introduction

Wildlife conservation is an essential component of environmental protection and sustainable development. Wildlife includes all living organisms that exist naturally in ecosystems without direct human control. These organisms play a vital role in maintaining ecological balance and supporting life systems on Earth (1). In recent decades, rapid population growth, industrialization, urban expansion, and technological advancement have created serious threats to wildlife across the globe

The increasing pressure on natural resources has resulted in habitat destruction, pollution, climate change, and loss of



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biodiversity. Wildlife conservation management aims to protect species, preserve habitats, and ensure sustainable use of biological resources (2). This paper discusses the present challenges faced by wildlife conservation and the strategies required to overcome these challenges at global and national levels.

2. Objectives of the Study

The main objectives of the present study are:

- To understand the concept and importance of wildlife conservation.
- To analyze the major challenges affecting wildlife conservation in the present global scenario.
- To examine the impact of human activities on wildlife and ecosystems.
- To highlight effective strategies for sustainable wildlife conservation management.
- To emphasize the role of laws, policies, and public participation in conservation.

3. Methodology

The present study is based on secondary data collected from books, research articles, government reports, environmental journals, and official publications of wildlife and environmental organizations. The study follows a descriptive and analytical approach to understand current conservation issues and management strategies. Simple and systematic analysis has been adopted to ensure clarity and originality.

4. Scope and Importance of Wildlife Conservation

Wildlife conservation is a scientific, social, and ethical process that focuses on the protection, preservation, sustainable utilization, and management of wild plants and animals along with their natural habitats. It aims to prevent the extinction of species, conserve biodiversity, and maintain ecological stability for the benefit of present and future generations. (4) Wildlife conservation does not deal only with animals but also includes plants, microorganisms, and entire ecosystems that support life on Earth. Wildlife forms an integral part of natural ecosystems and plays a vital role in maintaining environmental balance. Each species has a specific role in food chains and food webs, and the removal or decline of any species can disturb ecosystem functioning. Wildlife contributes significantly to essential ecosystem services such as pollination of crops, seed dispersal, nutrient cycling, soil formation, pest control, water purification, and regulation of climate. These services directly support agriculture, forestry, and human well-being. (7) The scope of wildlife conservation has widened due to increasing environmental problems such as habitat destruction, climate change, pollution, invasive species, and overexploitation of natural resources. Modern wildlife conservation includes habitat protection and restoration, conservation of endangered and endemic species, establishment of protected areas, wildlife corridors, and buffer zones (17). It also emphasizes community-based conservation, use of traditional knowledge, scientific research, wildlife monitoring, and application of modern technologies for conservation planning.

The importance of wildlife conservation can be clearly understood through the following points:

- Maintaining ecological balance and stability of ecosystems
- Supporting food chains and food web systems essential for survival of species
- Preserving genetic diversity necessary for adaptation, evolution, and resilience
- Promoting scientific research, education, and environmental awareness
- Supporting livelihoods through eco-tourism, forestry, and nature-based employment
- Conserving cultural, aesthetic, and traditional values linked with wildlife

The continuous loss of wildlife leads to ecosystem degradation, imbalance in natural processes, scarcity of natural resources, and increased vulnerability to climate change and natural disasters. Ultimately, the decline of wildlife directly affects ecosystem health and threatens human survival, as humans are deeply dependent on healthy ecosystems for food, water, climate regulation, and overall environmental sustainability (5). Therefore, wildlife conservation is not only an environmental necessity but also a fundamental requirement for sustainable and inclusive human development.



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5. Major Challenges to Wildlife Conservation

5.1 Habitat Loss, Climate Stress, and Ecosystem Imbalance

Habitat degradation continues to be the most severe threat to wildlife conservation at both national and global levels. Rapid population growth and economic development have increased pressure on natural ecosystems. Large areas of forests, grasslands, wetlands, and coastal ecosystems are being cleared for agriculture, urban settlements, industries, mining, transportation networks, and large development projects. This large-scale destruction of habitats reduces the availability of food, shelter, and breeding grounds for wildlife (3). Fragmentation of natural habitats further isolates animal populations, preventing free movement and migration. As a result, small and isolated populations face reduced genetic diversity, lower reproductive success, and higher chances of extinction. Climate change has added a new dimension to habitat loss and ecosystem instability. Rising global temperatures, changing rainfall patterns, frequent droughts, floods, cyclones, and wildfires have significantly altered natural environments. Many species depend on specific climatic conditions for survival, reproduction, and migration (11). Even small changes in temperature or rainfall can disturb breeding cycles, nesting behaviour, and food availability. Species that cannot adapt or migrate quickly enough experience population decline. Climate change also affects polar, mountain, and coastal ecosystems more severely, leading to the loss of specialized species and increased ecosystem imbalance.

5.2 Wildlife Exploitation and Ecological Disruption

Human exploitation of wildlife remains a major conservation challenge. Illegal hunting, poaching, and wildlife trade continue due to high demand for animal products such as meat, fur, skin, ivory, horns, bones, and traditional medicines. Endangered species are often targeted because of their high commercial value in international markets (6). Poaching not only reduces wildlife populations but also disrupts food chains and ecological balance. In many regions, weak enforcement of wildlife protection laws, lack of awareness, poverty, and limited alternative livelihoods contribute to the persistence of these illegal activities. Conflict between humans and wildlife, especially near forest boundaries, also leads to retaliatory killings and further population decline.

Invasive species have become an increasingly serious threat to native biodiversity. Non-native species introduced intentionally for agriculture, aquaculture, or ornamental purposes, as well as unintentionally through trade and transportation, often spread rapidly in new environments. These invasive species compete with native plants and animals for food, space, and resources (2). They may also introduce new predators, parasites, or diseases to which native species have no natural resistance. Over time, invasive species alter habitat structure, reduce species diversity, and weaken ecosystem stability.

5.3 Pollution and Wildlife Health

Environmental pollution poses long-term risks to wildlife survival and ecosystem health (8). Industrial effluents, untreated sewage, agricultural runoff containing pesticides and fertilizers, plastic waste, and heavy metals contaminate air, water, and soil.

Wildlife exposed to polluted environments often suffer from reduced fertility, genetic mutations, weakened immune systems, and increased mortality. Aquatic ecosystems are particularly affected, as water pollution leads to fish kills, coral bleaching, and the loss of aquatic biodiversity. Plastic pollution causes ingestion and entanglement, resulting in injury and death of birds, marine mammals, and reptiles (16). Emerging infectious diseases and pandemics among wildlife have become a growing concern in recent years. Habitat destruction, climate change, and increased interaction between humans, livestock, and wildlife create favourable conditions for the spread of diseases. Migratory species can transmit pathogens



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across regions and continents, increasing the risk of outbreaks. Wildlife diseases not only threaten biodiversity but also pose serious risks to human health through zoonotic transmission. The decline of wildlife health weakens ecosystem functions and reduces the resilience of natural systems.

6. Impact of Human Activities on Wildlife

Human activities such as industrialization, urbanization, overexploitation of resources, illegal mining, and infrastructure development have severely disturbed wildlife habitats. Agricultural practices using chemical fertilizers and pesticides affect soil organisms and aquatic life. Noise pollution and light pollution disturb animal behavior and reproduction (15). Unsustainable development practices without environmental impact assessment have intensified biodiversity loss. Lack of awareness and weak implementation of conservation laws further worsen the situation.

7. Wildlife Conservation Laws and Policies

Wildlife conservation laws and policies play a vital role in protecting animals, plants, and their natural habitats from overexploitation and destruction. These laws are designed to regulate human activities that threaten biodiversity and to ensure the sustainable use of natural resources. With increasing population pressure, industrial growth, and climate change, strong legal frameworks have become essential for conserving wildlife for present and future generations. At the international level, several agreements guide wildlife protection (17). Important among them are the Convention on Biological Diversity (CBD), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the Ramsar Convention on Wetlands. These agreements encourage countries to protect endangered species, regulate wildlife trade, and conserve important ecosystems. International cooperation is necessary because wildlife does not follow political boundaries, and many species migrate across countries. In India, wildlife conservation is supported by a well-developed legal framework. The Wildlife (Protection) Act, 1972 is the primary law for protecting wild animals, birds, and plants. This Act provides for the creation of protected areas such as national parks, wildlife sanctuaries, conservation reserves, and community reserves. It also lists species under different schedules, offering strict protection to endangered species and regulating hunting and trade. Amendments to the Act have further strengthened penalties for wildlife crimes (20). Another important policy is the National Wildlife Action Plan, which sets long-term strategies for wildlife conservation. It focuses on habitat protection, reduction of human–wildlife conflict, scientific research, and involvement of local communities. The Forest Conservation Act, 1980 and the Environment Protection Act, 1986 also indirectly support wildlife conservation by controlling deforestation and environmental pollution.

Policies related to wildlife conservation increasingly emphasize community participation. Modern conservation approaches recognize that local people living near forests depend on natural resources for their livelihoods. Laws such as the Forest Rights Act, 2006 aim to balance conservation goals with the rights of forest-dwelling communities (17). When communities are involved in decision-making and benefit-sharing, conservation efforts become more effective and sustainable. Despite strong laws, implementation remains a major challenge. Illegal poaching, wildlife trafficking, habitat loss, and weak enforcement reduce the effectiveness of conservation policies. Lack of awareness, insufficient funding, and limited trained staff also affect law enforcement. Therefore, regular monitoring, capacity building, and use of modern technology like camera traps and satellite tracking are necessary. In conclusion, wildlife conservation laws and policies provide a strong foundation for protecting biodiversity. However, their success depends on effective implementation, public awareness, scientific support, and cooperation between governments, communities, and conservation organizations. Strengthening these aspects is essential to ensure the long-term survival of wildlife and ecological balance.



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8. Conservation Strategies

8.1 Habitat and Development

Wildlife conservation depends greatly on the protection of natural habitats. Forests, wetlands, grasslands, and coastal ecosystems provide food, shelter, and breeding grounds for wildlife species. Establishing protected areas such as national parks and wildlife sanctuaries helps in conserving these habitats. Wildlife corridors and buffer zones reduce habitat fragmentation and allow safe movement of animals (12). At the same time, development activities must follow sustainable practices. Projects related to industries, mining, and infrastructure should strictly follow environmental guidelines. Sustainable use of natural resources reduces habitat loss and supports long-term conservation goals.

8.2 Laws and Technology

Effective wildlife protection requires strong laws and proper enforcement. Strict implementation of wildlife conservation laws, anti-poaching measures, and punishment for wildlife crimes is essential. Strengthening enforcement agencies with trained staff and adequate resources improves protection efforts (19). Modern technology such as GIS, drones, camera traps, and satellite monitoring helps in tracking wildlife, preventing illegal activities, and managing protected areas efficiently. Technology-based monitoring increases transparency and quick response to threats.

8.3 People and Science

Local communities play a key role in successful wildlife conservation. Involving people living near forests through awareness programs and eco-development initiatives helps reduce conflicts. Providing alternative livelihoods decreases dependence on forest resources. Along with community participation, scientific research and regular monitoring are important (16). Wildlife surveys, population studies, and ecological research help in understanding changes in species and ecosystems. Scientific data supports better planning and improves conservation outcomes.

9. Role of Education and Awareness

Education and awareness play a decisive role in ensuring effective wildlife conservation and sustainable management of natural resources. One of the major reasons for biodiversity loss and environmental degradation is the lack of awareness among people, policymakers, and stakeholders about the importance of wildlife and ecosystems. Education helps individuals understand the value of biodiversity, the functioning of ecosystems, and the close interdependence between nature and human well-being. An informed and aware society is more likely to respect wildlife, follow conservation laws, and support sustainable development practices. Formal education serves as a strong foundation for developing environmental responsibility (16). The inclusion of environmental studies, wildlife conservation, ecology, and biodiversity topics in school and college curricula helps students develop scientific knowledge and positive attitudes towards nature from an early age. Higher education institutions and universities contribute significantly by offering specialized courses in wildlife biology, forestry, conservation management, and environmental sciences. Field-based learning, nature camps, biodiversity surveys, and educational visits to wildlife sanctuaries and national parks strengthen practical understanding and create emotional connections with wildlife.

Community-level awareness is particularly important in rural and forest fringe areas where people interact closely with wildlife. Local communities often depend on forest resources for livelihood, and unsustainable practices may unintentionally harm wildlife habitats. Awareness programs conducted through village meetings, workshops, training sessions, and extension activities educate communities about conservation laws, sustainable resource use, and human–



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wildlife conflict mitigation. When people understand that wildlife conservation supports long-term benefits such as eco-tourism, employment opportunities, and ecosystem services, they become active partners in conservation initiatives. Mass media and digital platforms play a powerful role in spreading awareness about wildlife conservation. Television programs, documentaries, newspapers, radio, and online platforms highlight issues such as habitat loss, climate change, pollution, and illegal wildlife trade. Visual communication and real-life conservation success stories help shape public opinion and encourage responsible behavior (7). Social media platforms have emerged as effective tools for engaging youth, promoting environmental campaigns, and mobilizing public participation in conservation movements.

Non-governmental organizations (NGOs), environmental groups, and research institutions contribute significantly to education and awareness activities. These organizations conduct wildlife awareness programs, nature education camps, biodiversity festivals, and citizen science initiatives. NGOs also act as a link between government agencies and local communities, helping in the effective implementation of conservation policies and projects. Education and awareness are equally essential for policymakers, administrators, and enforcement agencies (19). Training and capacity-building programs for forest officials, wildlife managers, police, and judiciary improve understanding of wildlife laws, ethical responsibilities, and modern conservation strategies. Well-informed and trained officials are better equipped to control wildlife crimes and ensure effective conservation management.

In the long term, education and awareness lead to positive behavioural change, sustainable lifestyles, and informed decision-making. A society that understands the importance of wildlife is more likely to protect biodiversity and support conservation efforts (7). Therefore, strengthening education and awareness is a fundamental strategy for achieving long-term wildlife conservation and ecological sustainability for future generations.

10. Conclusion

Wildlife conservation is a global responsibility that is essential for maintaining ecological balance, environmental sustainability, and human survival. Wildlife forms the foundation of healthy ecosystems, and the loss of biodiversity directly affects ecosystem stability, availability of natural resources, and the overall quality of human life. In the present global scenario, wildlife faces serious threats due to habitat destruction, deforestation, climate change, pollution, illegal wildlife trade, invasive species, emerging diseases, and unsustainable human activities. These challenges have accelerated species extinction and disrupted natural ecological processes. The present study clearly indicates that wildlife conservation cannot be achieved through isolated or short-term efforts. Effective conservation management requires an integrated and holistic approach that combines strong policy support, scientific research, technological applications, community participation, education, and sustainable development practices. Legal frameworks such as the Wildlife Protection Act and international conservation agreements provide a strong foundation, but their success depends on proper implementation, monitoring, and enforcement.

Scientific research and continuous wildlife monitoring are essential for understanding ecological changes, identifying threats, and developing evidence-based conservation strategies. Community participation plays a crucial role in long-term conservation success. Local communities living near forests and protected areas are key stakeholders, and their involvement ensures sustainable resource use, reduced human–wildlife conflict, and improved conservation outcomes. Education and awareness further strengthen conservation efforts by promoting environmental ethics, responsible behaviour, and public support for wildlife protection initiatives. In the face of increasing environmental challenges and climate uncertainty, development must be balanced with conservation priorities. Development activities should follow environmental guidelines to minimize ecological damage and protect critical habitats. Protecting wildlife today is not only about saving species but also about safeguarding ecosystem services such as clean air, water, fertile soil, and climate regulation that are vital for human well-being.



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In conclusion, wildlife conservation is an urgent necessity and a shared responsibility of governments, institutions, communities, and individuals. Protecting wildlife and their habitats today will ensure a stable, healthy, and resilient environment for present and future generations.

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