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The Role of Protected Areas in Biodiversity Conservation in Indian Culture- An Overview

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ABSTRACT: According to the definition given by IUCN (International Union for Conservation of Nature) protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values. Protected areas play a crucial role in conservation of biodiversity, preservation of ecosystem services for people etc. Protected areas in India are those in which human occupation or at least the exploitation of resources is limited. Numerous international conventions and domestic laws established in India regulate the governance of these protected areas within the country.

KEYWORDS: protected, biodiversity, conservation, Indian, culture

I. INTRODUCTION

Status of Protected Areas in India & World

Protected Areas in India are the principal mechanism of conservation of biodiversity on Earth and serve as the most important units for in-situ biodiversity conservation.

With only 2.4% of the world's land area, 16.7% of the world's human population and 18% livestock, it contributes about 8% of the known global biodiversity

Over 120,000 designated protected areas cover about 13% of the Earth's land surface.

Marine protected areas cover 6.3% of territorial seas and 0.5% of the high seas.

IUCN categories of Protected areas into six categories[1,2,3]

Category Ia– Strict Nature Reserve: Protected areas in India managed mainly for science and receive the least human intervention. E.g. Urwald Rothwald in Austria

Category Ib – Wilderness Area: Wilderness protection. E.g. wilderness areas in the Sami native region in Finland

Category II – National Park: ecosystem protection and recreation

Category III – Natural Monument or Feature: Conservation of specific natural features. E.g. cliffs, caves, forest groves. E.g. Cono de Arita in Argentina.

Category IV – Habitat/Species Management Area: Conservation of specific species that require protection.

Category V – Protected Landscape/Seascape: Conservation of the entire area. It permits the surrounding community to interact. Example: Great Barrier Reef in Australia

Category VI – Protected Area with sustainable use of natural resources: Conservation of ecosystem and habitats together with associated cultural values and traditional natural resource management systems.[1,2,3]

Guardians of Biodiversity: Importance and Impact of Protected Areas in India

Biodiversity Conservation- Protected areas serve as crucial habitats for diverse plant and animal species, playing a vital role in safeguarding biodiversity and preventing the extinction of vulnerable and endangered species.

Climate Change Mitigation- Protected areas, especially forests, act as carbon sinks by absorbing and storing carbon dioxide, a key greenhouse gas. They help mitigate climate change and regulate local and global climates.

Supporting Local Communities- Protected areas can provide economic benefits to local communities through tourism, sustainable resource management, and job creation.

Prevent Habitat Loss- Protected areas act as refuges for flora and fauna, preventing habitat loss due to activities like deforestation, urbanization, and agriculture. They play a crucial role in maintaining ecological balance.

International Cooperation- Participation in international agreements and conventions, such as CITES, IUCN, and UNESCO-World Heritage Committee, showcases global cooperation in conservation efforts and contributes to the protection of biodiversity on a larger scale.



Preserving Nature’s Legacy: A Comprehensive Guide to Protected Areas in India

India has a network of 998 Protected Areas covering about 5.28% of its total geographic area. Protected areas in India have been categorised according to the Wildlife Protection Act 1972. It categorised protected areas into four categories:

- National Parks
- Wildlife Sanctuaries
- Conservation Reserves
- Community Reserves

Preserving Pristine Ecosystems: National Parks as Crucial Protected Areas for Conservation in India [4,5,6]

A national park is a protected area officially identified by the state government to conserve its ecological, faunal, floral, geomorphological, or zoological significance. It is categorised in the second schedule of the IUCN list. The power to declare national parks lies with both the central and state governments, highlighting the joint responsibility for preserving these critical areas. Hailey National Park was established in 1936 as India’s first national park. It is now known as the Jim Corbett National Park in Uttarakhand. For example Papikonda, Dihing Patkai, Gir etc are some National Parks in India.

National parks as a world commission on protected areas enforce strict regulations on human activities within their precincts. Despite these restrictions, certain activities can be permitted by the Chief Wildlife Warden on conditions specified in Wildlife Protection Act 1972. This flexible approach strikes a balance, allowing controlled human intervention while prioritizing the overarching goal of maintaining the ecological integrity of the national park.

The boundaries of National parks are fixed and defined. Once a protected area in India is declared a national park then their status cannot be altered to that of a ‘sanctuary,’ underscoring their lasting and pivotal role in conservation efforts. National parks are given the highest level of protection.[3,4,5]

II. DISCUSSION

Guardians of Biodiversity: Wildlife Sanctuary Protected Areas for Conservation in India

A wildlife sanctuary, characterized by its significant ecological, faunal, floral, geomorphological, or zoological attributes, is declared to safeguard, propagate, or enhance wildlife and its environment. Within these sanctuaries, certain rights of residents may be permitted, creating a balanced approach to conservation. Wildlife sanctuaries in India are classified as IUCN Category IV protected areas in India, highlighting their importance for conservation.[7,8,9]

India has 570 wildlife sanctuaries, covering a substantial area of 122,509.33 km², which accounts for 3.73% of the country’s geographical expanse.

A wildlife sanctuary is a designated area owned by the government or a private entity, aimed at safeguarding specific species of plants or animals, either seasonally or throughout the year. A Wildlife Sanctuary has the potential to be elevated to National Park status, but the reverse, degrading a National Park into a Wildlife Sanctuary, is not permissible.

Parameters	National Park	Wildlife Sanctuary
Degree of protection	Greater	Lesser
Statute	WPA 1972	WPA 1972
Activities like grazing of livestock, hunting, forestry etc.	Prohibited	Allowed
Established for a particular species	No (habitat specific conservation)	Yes (species specific conservation)
Protected area management under IUCN	Category II	Category IV
Difference in conservation	The difference in conservation value of a National Park from that of a sanctuary is not specified in the WPA 1972.	

Balancing Nature’s Ledger: Conservation Reserves as Essential Protected Areas for Conservation in India

It can be declared by the State Governments in any area owned by the Government, particularly the areas adjacent to National Parks and Sanctuaries and those areas which link one Protected Area with another. Such a declaration should be made after having consultations with the local communities.



Conservation Reserves are declared for the purpose of protecting landscapes, seascapes, flora and fauna and their habitat. The rights of people living inside a Conservation Reserve are not affected. There are 100 existing conservation reserves in India, covering an area of 4927.28 km², or 0.15 percent of the country’s geographical area.

Conservation reserves act as buffer zones between established national parks, wildlife sanctuaries and reserved and protected forests of India. For Example- Bankapur Peacock Conservation Reserve, Beas River Conservation Reserve etc.

Sustainable Stewardship: Community Reserves as Vital Protected Areas for Conservation in India

Community Reserves are designated on private or community land, excluding areas within a National Park, Sanctuary, or Conservation Reserve. These reserves emerge when an individual or a community willingly commits to wildlife and habitat conservation efforts. There are 219 existing community reserves in India, covering an area of 1446.28 km², or 0.043 percent of the country’s geographical area.

Beyond their primary purpose, these areas serve as buffer zones connecting established national parks, wildlife sanctuaries, and reserved and protected forests in India. Importantly, the establishment of a Community Reserve does not impact the rights of individuals residing within its boundaries. For Example- : Lalwan community reserve, Gogabeel in Bihar etc.[5,6,7]

III. RESULTS

Protection level- National Parks > Wildlife Sanctuary > Reserved forests > Protected forests

Protected Areas	No.	% of Area Covered
National Parks (NPs)	106	1.35
Wildlife Sanctuaries (WLSs)	573	3.74
Conservation Reserves (CRs)	115	0.16
Community Reserves	220	0.04
Total Protected Areas (PAs)	1014	5.28

List of National Parks in India

Year	Name of National Park	State
1936	Corbett National Park	Uttarakhand
1955	Kanha National Park	Madhya Pradesh
1955	Tadoba National Park	Maharashtra
1959	Madhav National Park	Madhya Pradesh
1968	Bandhavgarh National Park	Madhya Pradesh
1974	Kaziranga National Park	Assam
1974	Bandipur National Park	Karnataka
1974	Bannerghatta National Park	Karnataka
1975	Gir National Park	Gujarat
1975	Gugamal National Park	Maharashtra
1975	Navegaon National Park	Maharashtra
1975	Pench National Park	Madhya Pradesh
1976	Blackbuck National Park	Gujarat
1976	Guindy National Park	Tamil Nadu
1977	Keibul-Lamjao National Park	Manipur
1977	Khangchendzonga National Park	Sikkim
1977	Dudhwa National Park	Uttar Pradesh
1978	Eravikulam National Park	Kerala
1979	Vansda National Park	Gujarat
1979	Van Vihar National Park	Madhya Pradesh
1980	Simlipal National Park	Odisha
1980	Ranthambore National Park	Rajasthan
1980	Gulf of Mannar Marine National Park	Tamil Nadu
1981	Guru Ghasidas (Sanjay) National Park	Chhattisgarh
1981	Dachigam National Park	Jammu & Kashmir



1981	Hemis National Park	Jammu & Kashmir
1981	Kishtwar National Park	Jammu & Kashmir
1981	Panna National Park	Madhya Pradesh
1981	Sanjay National Park	Madhya Pradesh
1981	Satpura National Park	Madhya Pradesh
1981	Keoladeo Ghana National Park	Rajasthan
1982	Indravati National Park	Chhattisgarh
1982	Kanger Valley National Park	Chhattisgarh
1982	Marine National Park	Gujarat
1982	Periyar National Park	Kerala
1982	Nanda Devi National Park	Uttarakhand
1982	Valley of Flowers National Park	Uttarakhand
1983	Mahatma Gandhi Marine National Park	Andaman & Nicobar Islands
1983	Namdapha National Park	Arunachal Pradesh
1983	Fossil National Park	Madhya Pradesh
1983	Sanjay Gandhi National Park	Maharashtra
1983	Rajaji National Park	Uttarakhand
1984	Great Himalayan National Park	Himachal Pradesh
1984	Silent Valley National Park	Kerala
1984	Sunderban National Park	West Bengal
1985	Balpakram National Park	Meghalaya
1986	Mouling National Park	Arunachal Pradesh
1986	Betla National Park	Jharkhand
1986	Nokrek Ridge National Park	Meghalaya
1986	Neora Valley National Park	West Bengal
1986	Singalila National Park	West Bengal
1987	Middle Button Island National Park	Andaman & Nicobar Islands
1987	Mount Harriet National Park	Andaman & Nicobar Islands
1987	North Button Island National Park	Andaman & Nicobar Islands
1987	Saddle Peak National Park	Andaman & Nicobar Islands
1987	South Button Island National Park	Andaman & Nicobar Islands
1987	Pin Valley National Park	Himachal Pradesh
1987	Anshi National Park	Karnataka
1987	Kudremukh National Park	Karnataka
1988	Nagarahole (Rajiv Gandhi) National Park	Karnataka
1988	Bhitarkanika National Park	Odisha
1989	Sri Venkateswara National Park	Andhra Pradesh
1989	Valmiki National Park	Bihar
1989	Sultan National Park	Haryana
1989	Indira Gandhi (Annamalai) National Park	Tamil Nadu
1989	Gangotri National Park	Uttarakhand
1990	Manas National Park	Assam
1990	Mudumalai National Park	Tamil Nadu
1990	Mukurthi National Park	Tamil Nadu
1990	Govind National Park	Uttarakhand
1991	Murlen National Park	Mizoram
1992	Campbell Bay National Park	Andaman & Nicobar Islands
1992	Galathea Bay National Park	Andaman & Nicobar Islands
1992	Mollem National Park	Goa
1992	City Forest (Salim Ali) National Park	Jammu & Kashmir
1992	Phawngpui Blue Mountain National Park	Mizoram
1992	Desert National Park	Rajasthan
1992	Sariska National Park	Rajasthan
1992	Buxa National Park	West Bengal
1992	Gorumara National Park	West Bengal
1993	Intanki National Park	Nagaland
1994	Kasu Brahmananda Reddy National Park	Telangana



1994	Mahaveer Harina Vanasthali National Park	Telangana
1994	Mrugavani National Park	Telangana
1996	Rani Jhansi Marine National Park	Andaman & Nicobar Islands
1998	Nameri National Park	Assam
1999	Dibru-Saikhowa National Park	Assam
1999	Rajiv Gandhi Orang National Park	Assam
2003	Kalesar National Park	Haryana
2003	Anamudi Shola National Park	Kerala
2003	Mathiketta Shola National Park	Kerala
2003	Pampadum Shola National Park	Kerala
2004	Chandoli National Park	Maharashtra
2005	Rajiv Gandhi (Rameswaram) National Park	Andhra Pradesh
2006	Mukundra Hills National Park	Rajasthan
2007	Clouded Leopard National Park	Tripura
2007	Bison National Park	Tripura
2008	Papikonda National Park	Andhra Pradesh
2010	Inderkilla National Park	Himachal Pradesh
2010	Khirganga National Park	Himachal Pradesh
2010	Simbalbara National Park	Himachal Pradesh
2014	Jaldapara National Park	West Bengal

International Conventions/Conferences on the conservation of Protected Areas in India

Ramsar Convention on Wetlands (1971)- It emphasizes the conservation and wise use of wetlands which are included in those designated as protected areas in India.

Convention on Biological Diversity (CBD) – Aichi Targets (2010)- It put emphasis on the conservation of biodiversity, including protected areas in India, with a set of strategic goals known as the Aichi Targets.

Aichi Target 11 specifically addresses protected areas, aiming to increase their coverage and improve their effectiveness. Coverage of protected areas of India is far below than the Aichi Target.

World Heritage Convention (1972)- It identifies and protects cultural and natural heritage sites of outstanding universal value, some of which are designated as protected areas in India. It is administered by UNESCO.

Convention on Migratory Species (CMS) – Bonn Convention (1979)– Focuses on the conservation of migratory species, some of which depend on protected areas during their life cycles. Encourages the establishment of protected areas critical for the conservation of migratory species.

United Nations Framework Convention on Climate Change (UNFCCC)– Addresses climate change, recognizing the role of protected areas in India in climate adaptation and mitigation. Supports the conservation and sustainable management of forests, which often include protected areas.

Convention Concerning the Protection of the World Cultural and Natural Heritage (1972)- Safeguards cultural and natural heritage sites, some of which may be designated as protected areas in India. Establishes the World Heritage Committee to oversee the implementation of the convention.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1973)– Regulates international trade in endangered species and protects their habitats, including those within protected areas. Controls the international trade of species.

United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) (2007)- Recognizes the rights of people who live around protected areas. Emphasizes the importance of obtaining the free, prior, and informed consent of indigenous communities regarding activities affecting their lands.

World Commission on Protected Areas (WCPA)- It aims to develop and provide scientific and technical advice and policy that promotes a representative, effectively managed and equitably governed global system of protected areas. Rules and Regulation for conservation of Protected areas in India



Forests and wildlife are categorised under the Concurrent List of the Indian Constitution. So the Union government makes policies and plans for Wildlife Conservation whereas the State Forest Departments implant those national policies and plans at the state level.

Wildlife (Protection) Act, 1972- The constitution and governance of Protected Areas (PAs) are primarily defined under the Wildlife (Protection) Act, 1972. The National Board for Wildlife (NBWL) was created under this act.

It is a statutory organization and advises the Central Government on framing policies and measures for the conservation of wildlife in the country.[7,8,9]

NBWL reviews all wildlife-related matters and approves projects in and around national parks and sanctuaries. Boundaries of protected areas can not be done without the approval of the NBWL.

NBWL has 47 members and is chaired by the Prime Minister. Out of these 19 members are ex-officio members including three Members of Parliament (two from Lok Sabha and one from Rajya Sabha), five NGOs, and 10 eminent ecologists, conservationists, and environmentalists.

The State Board for Wildlife consulted by the State government on the selection and management of areas to be declared as protected areas.

Complementary Acts- The implementation of the Wildlife (Protection) Act is complemented by other relevant Acts, including the Indian Forest Act, 1927, Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986, and Biological Diversity Act, 2002.

Recognition of Forest Rights Act, 2006- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006, plays a role in acknowledging and safeguarding the rights of forest-dwelling communities within Protected Areas in India.

Wildlife Crime Control Bureau (WCCB)- It collaborates with state governments to combat wildlife crimes. It enforces the Convention on International Trade in Endangered Species of wild fauna and flora (CITES) and addresses wildlife crimes with cross-border, interstate, and international implications.

International Conventions- India actively participates in major international conventions to strengthen global wildlife conservation efforts. These include agreements with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), International Union for Conservation of Nature (IUCN), International Convention for the Regulation of Whaling, UNESCO-World Heritage Committee, and Convention on Migratory Species (CMS).

Safeguarding Nature's Heritage: Effective Strategies for Protected Area Management in India

Habitat Loss and Fragmentation- The ongoing challenges involve the loss and fragmentation of natural habitats, posing a significant threat to the diverse ecosystems supporting India's wildlife.

For example a major decline in Nilgiri Tahr which is confined to the Western Ghats, faces habitat loss due to deforestation and potentially faces challenges from rising temperatures.

Overuse of Biomass Resources and Human- The increasing pressure on biomass resources contributes to human-wildlife conflicts, requiring a delicate balance to address the needs of both ecosystems and local communities.

For Example- extinction of vulture due to use of diclofenac, human-monkey conflict, crop destruction by elephants all these species move to human land due to extra encroachment by humans.

Livelihood Reliance on Forests and Wildlife- Communities relying on forests and wildlife for their livelihoods create a complex dynamic, necessitating sustainable practices to ensure coexistence without compromising conservation goals. Deforestation for timber, firewood, or agricultural land are the main consequences of this.

Poaching and Illegal Wildlife Trade- Illicit activities, including poaching and illegal trade in wildlife parts and products especially in Big Game Countries, present a critical challenge that demands robust strategies for enforcement and prevention.

For Example Declining the Rhino population, illegal pangolin trade led to declining the population of Pangolin.



Preserving Wilderness: Strategic Measures for Effective Conservation of Protected Areas in India

Vigilance against Wildlife Crimes- Increase patrolling efforts and vigilance to combat wildlife crimes, particularly poaching. Strengthen enforcement measures to safeguard endangered species and their habitats.

Promote Public Awareness- Generating awareness and sensitivity among the public regarding the importance of preserving the last strongholds of wildlife in the country. Encourage a sense of responsibility towards protecting these crucial ecosystems.

Increase Funding for Conservation and Protected Areas- Secure increased funding for conservation and protected area management. Transition to reliable, long-term funding sources to ensure sustained efforts in preserving natural habitats. Collaborate with Local Communities for Tailored Conservation- Collaborate with indigenous peoples and local communities to determine conservation strategies suited to their specific land and seascapes, ensuring that efforts align with local needs and traditions.

Exploring India's Ecological Jewels: Unveiling the Diversity of Specific Protected Areas in India
Tiger Reserve

In 1973, the Government of India initiated Project Tiger with the primary objective of protecting the endangered tiger species prevalent in the country.

Tiger Reserves were established following a core/buffer strategy, designating core areas as national parks or sanctuaries, while buffer or peripheral areas comprise a blend of forest and non-forest land, managed as multiple-use zones.

It is administered by the National Tiger Conservation Authority (NTCA).

Presently, India accommodates a total of 54 Tiger Reserves (with the most recent addition being the Dholpur-Karauli Tiger Reserve in Rajasthan).

Eco-Sensitive Zone[9,10,11]

These are protected land which falls within 10 km of the boundaries of national parks and wildlife sanctuaries. These lands are declared under the Environmental (Protection Act, 1986).

These areas are based on the core and buffer model of management. Their core area has the legal status of being a national park. Buffer area could be reserved forest, wildlife sanctuary or tiger reserve.

Biosphere Reserve

Biosphere reserves are areas of terrestrial and coastal/ marine ecosystems where both flora and fauna are protected and sustainable livelihood development is promoted.

They are 'Science for Sustainability support sites.'

Core: In its core area nor human activity allowed.

Buffer Zone: Used for scientific research

Transition Zone: Ecologically sustainable human settlements and economic activities are permitted. Like tourism

IV. CONCLUSION

State-wise Protected Sites and Ramsar Sites of India

Andaman & Nicobar Islands National Parks

Andhra Pradesh National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites

Arunachal Pradesh National Parks, Tiger Reserves and Wildlife Sanctuaries

Assam National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites

Bihar National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites

Chhattisgarh National Parks, Tiger Reserves and Wildlife Sanctuaries

Goa National Parks, Wildlife Sanctuaries & Ramsar Sites

Gujarat National Parks, Wildlife Sanctuaries & Ramsar Sites

Himachal Pradesh National Parks, Wildlife Sanctuaries & Ramsar Sites

Jammu & Kashmir National Parks, Wildlife Sanctuaries & Ramsar Sites

Ladakh National Parks, Wildlife Sanctuaries & Ramsar Sites

Jharkhand National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites

Karnataka National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites

Kerala National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites



Madhya Pradesh National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites
Maharashtra National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites
Manipur National Parks, Wildlife Sanctuaries & Ramsar Sites
Meghalaya National Parks and Wildlife Sanctuaries
Mizoram National Parks, Wildlife Sanctuaries & Ramsar Sites
Nagaland National Parks and Wildlife Sanctuaries
Odisha National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites
Punjab and Chandigarh, Wildlife Sanctuaries & Ramsar Sites
Rajasthan National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites
Sikkim National Parks and Wildlife Sanctuaries
Tamil Nadu National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites
Telangana National Parks, Tiger Reserves and Wildlife Sanctuaries
Tripura National Parks, Wildlife Sanctuaries & Ramsar Sites
Uttar Pradesh National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites
Uttarakhand National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites
West Bengal National Parks, Tiger Reserves, Wildlife Sanctuaries & Ramsar Sites[11]

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