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Biodiversity Conservation Awareness among Indian

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Abstract
India ranks as one of the most biodiverse countries worldwide because it contains 7 to 8 percent of Earth's known species while occupying only 2.4 percent of Earth's total land area. The public lacks understanding of biodiversity and its value and the environmental losses that exist despite the country's abundant natural resources. The research investigates how much Indian citizens know about biodiversity protection throughout their urban and rural areas and different age groups and educational levels. The study examines how Indians interact with nature through three main elements which include cultural practices and institutional structures and media content. The study identifies successful awareness initiatives while highlighting their shortcomings. The article demonstrates through research studies and government documents and international body data that awareness needs structural backing and policy work and community engagement and educational transformation. The study examines different methods for increasing conservation awareness through educational programs and community conservation initiatives and online platforms and traditional indigenous knowledge systems.

Keywords: *environmental awareness, India, conservation education, biodiversity conservation, indigenous knowledge, wildlife policy*

I. Introduction

India has an extremely high level of biological diversity. The country hosts over 91,000 animal species and more than 45,500 plant species according to data from the Botanical Survey of India and the Zoological Survey of India. India contains four of the world's 36 biodiversity hotspots which include the Himalayas and the Western Ghats and the Indo-Burma region and the Sundaland that contains the Nicobar Islands. The statistics represent millions of years which show evolutionary development with ecological connections that scientists have not yet documented.

India currently experiences extensive biodiversity decline which is happening at an increasing speed. Species populations and ecosystem integrity suffer from multiple factors which include habitat destruction and resource overexploitation and pollution and invasive species and climate change. The 2019 IPBES Global Assessment Report on Biodiversity and Ecosystem Services estimated that around one million species globally face extinction many within decades because land-use change occurs at high rates in India's forests and wetlands and grasslands.

Public awareness serves as an essential requirement for effective conservation although it does not guarantee successful conservation outcomes. People cannot advocate for what they do not know exists, cannot make informed choices about land use and consumption without understanding ecological consequences, and cannot hold governments accountable for biodiversity commitments they have never heard of. Building genuine conservation awareness among India's 1.4 billion people is therefore not a peripheral concern. The country's ability to protect its exceptional biodiversity will depend on this crucial aspect for the upcoming decades.

II. The Current State of Biodiversity Awareness in India

2.1 Urban Populations: Awareness Without Action

Educated urban Indians who have obtained college degrees or higher educational qualifications between 2003 and 2023 have experienced improved biodiversity awareness due to better media coverage and the emergence of wildlife documentaries and citizen science platforms such as eBird and iNaturalist. English-language newspapers provide adequate coverage of The India State of Forest Report 2021 (FSI, 2021) and other government publications which deliver urban middle-class readers basic information about forest cover and wildlife status through their headlines. People understand environmental problems but they do not take action or support environmental causes. Research about environmental psychology shows that people express environmental concern without

making actual changes to their behavior which researchers identify as the value-action gap phenomenon (Blake, 1999). The Indian urban environment shows a significant gap between these two elements. Urban Indians show high concern about wildlife loss and deforestation according to surveys conducted by WWF-India and the Centre for Science and Environment but they show low environmental political engagement and they donate minimum amounts to conservation groups.

The answer requires an understanding of two structural components. Urban Indians face genuine competing priorities, economic pressure, infrastructure challenges, air quality concerns, access to basic services, which creates a situation where biodiversity becomes an expensive problem. The urban disconnect from natural systems also matters. A person who has never seen a wild leopard, visited a functioning forest, or walked in a healthy wetland may struggle to feel personally connected to their loss, even if they intellectually understand the problem.

2.2 Rural Communities: Proximity Without Formal Framing

People in rural Indian villages display different patterns of understanding than other communities. People who live near forests and rivers and agricultural areas encounter biodiversity through their daily activities which urban people cannot experience. Farmers learn about bird species when seasonal crops start to grow. Fishing communities understand fish population dynamics through direct observation over generations. Adivasi forest communities hold extensive traditional ecological knowledge about plant species and animal behavior and ecological seasonal patterns and habitat relationships which exceeds the details found in scientific surveys.

The Biological Diversity Act of 2002 established Biodiversity Management Committees at local levels to protect traditional knowledge. The National Biodiversity Authority reported that India had established 190000 BMCs by 2020 although states showed different levels of implementation success (NBA 2020). Rural communities need formal frameworks which connect their local biodiversity knowledge to national conservation efforts that include ecosystem services protection and legal framework awareness and national and global trends identification. The organization needs to build two-way communication channels which will solve the problem instead of using one-way awareness programs.

III. Factors Shaping Biodiversity Awareness in India

3.1 Cultural and Religious Dimensions

Urban residents experience biodiversity through daily life which differs from the way people near forests and rivers and agricultural areas do so. Farmers possess knowledge about which bird species will arrive during specific seasons when their crops reach maturity. Fishing communities acquire fish population knowledge through their direct observation of fish behavior which they have maintained across multiple generations. Adivasi communities who reside in forests possess comprehensive traditional ecological knowledge about plant species and animal behavior and ecological seasons and habitat relationships which exceeds the details that scientific surveys have documented.

The Biological Diversity Act of 2002 established traditional knowledge as an important element of biodiversity preservation through its establishment of local Biodiversity Management Committees (BMCs) which operate to create People's Biodiversity Registers that document traditional knowledge. According to National Biodiversity Authority (NBA, 2020) data from 2020 over 190000 BMCs had been established throughout India although the implementation quality between states showed significant differences. Local biodiversity knowledge exists within rural communities yet they need formal systems which establish connections between their local knowledge and national conservation efforts together with ecosystem services language and legal protection understanding and knowledge of how their local experiences match national and worldwide trends. Two-way communication needs to replace one-directional awareness campaigns in order to solve the existing gap.

3.2 Education System and Formal Awareness Building

The primary school curriculum of India teaches environmental subjects through Environmental Studies and the secondary school curriculum through the study of ecology which exists in both biology and geography. The National Council of Educational Research and Training (NCERT) has progressively updated environmental content in textbooks and the National Education Policy 2020 explicitly requires all educational materials to include sustainability and environmental knowledge from the start of education until the end.2902020

The majority of Indian textbooks treat biodiversity in an abstract manner that presents information through statements The students acquire knowledge that India possesses diverse biological species which include endangered animals and that

deforestation results in environmental damage. The pupils of the school system develop an understanding of environmental issues which exists at an extensive level. The pupils acquire environmental language skills but they do not comprehend how environmental systems function or what environmental dangers will result from their actions.

Teacher training programs create additional obstacles for this situation. The majority of Indian science teachers possess minimal knowledge about field ecology and they have never been to protected areas and they do not have the necessary materials to bring their students into outdoor settings for practical study. Biodiversity awareness remains an exam subject because students do not experience nature firsthand through their education.

As shown in Figure 1, there is a layered relationship between different sources of biodiversity awareness in India, with each source reaching different populations with different depth and durability of impact.

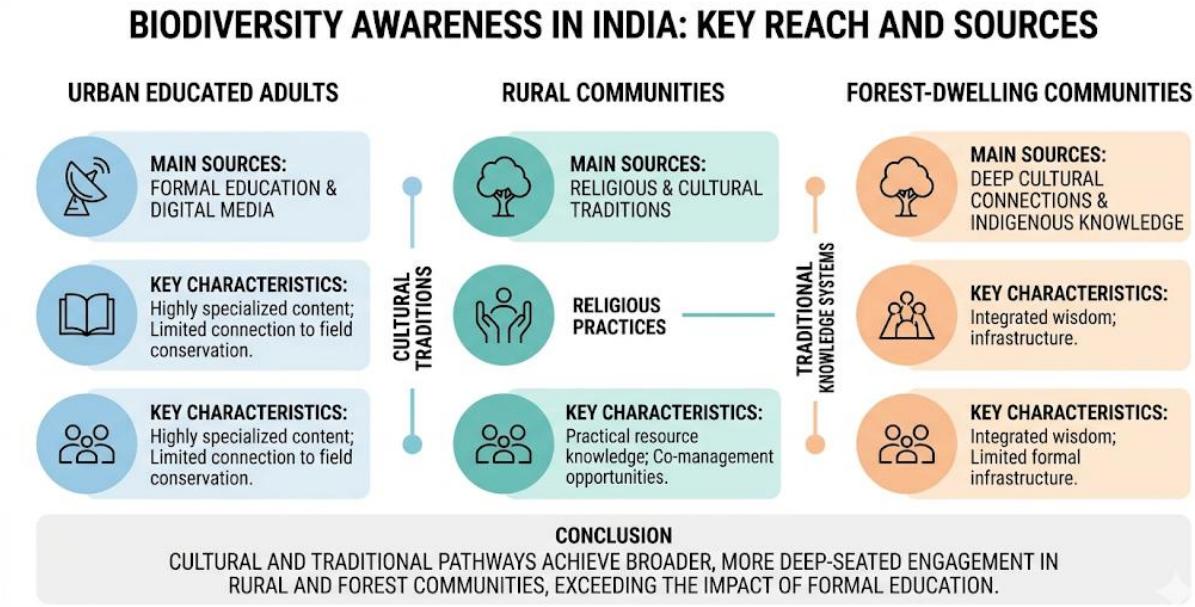

Figure 1: Sources and Relative Reach of Biodiversity Awareness Among Different Indian Population Segments

The diagram shows five different ways to raise public awareness through three educational methods which include formal education and wildlife documentaries through mass media and religious and cultural traditions and community-based conservation programs and citizen science platforms. The different levels of engagement are shown through cell shading which indicates the different levels of engagement from basic exposure to complete understanding of the material. The diagram shows that indigenous and rural communities respond better to cultural and traditional pathways than they do to formal educational systems and digital media platforms which mainly benefit urban educated people. Community-based conservation programs establish broad connections with different population groups although their actual program execution shows significant differences. The framework uses Kothari et al. (2013) research from Sharing Power: Learning by Doing in Co-management of Natural Resources Worldwide while deriving information from National Biodiversity Authority implementation reviews (NBA, 2020).

3.3 Media, Digital Platforms, and Wildlife Communication

The media landscape in India has multiplied its size since 2001, which has resulted in increased wildlife and nature programming on television. The dedicated wildlife channels and BBC Earth and National Geographic and Discovery networks successfully reach large audiences in urban areas. The Doordarshan network and regional channels broadcast Hindi-language wildlife documentaries, which enable access to semi-urban and rural audiences who own television sets. Social media platforms such as YouTube and Instagram enable Indian wildlife communicators to develop content that presents local biodiversity in formats that people can easily understand and enjoy.

The eBird India platform had recorded over 100 million bird observations by 2022, which stemmed from the contributions of hundreds of thousands of birders who observed birds throughout

the nation (eBird 2022). The iNaturalist platform contains millions of biodiversity studies, which document different species from various biological categories throughout India. The platforms create scientific research output while they educate users about species identification through community-based learning activities. A student who uses iNaturalist to identify a dragonfly he photographed at his school pond has experienced different learning than a student who studies dragonfly diversity through a textbook.

IV. Conservation Awareness Programs: What Has Worked

4.1 Project Tiger and Flagship Species Communication

The 1973 Project Tiger initiative in India stands as one of the most famous conservation initiatives worldwide because its ecological results developed through its communicative methods. The conservation program of Project Tiger established an effective conservation approach which Indian citizens found emotionally relatable and visually attractive and which political leaders considered acceptable. The National Tiger Conservation Authority NTCA 2022 reports that India's tiger population increased from 1827 tigers in 2014 to 2967 tigers in 2022 which led to a national media campaign that successfully educated people about wildlife conservation achievements.

The flagship species model has limitations, of course. The protection of tigers establishes conservation awareness which does not extend to species that lack appeal or to ecosystem conservation activities. The public neglected to recognize the vulture population decline which started in the 1990s when veterinarians began using the anti-inflammatory drug diclofenac for treatment despite vultures providing essential ecological functions. The conservation status of pollinators and freshwater fish and amphibians and soil invertebrates demonstrates urgent ecological needs yet these groups maintain low public awareness.

4.2 Community-Based Conservation and Awareness

The most successful methods for raising awareness about biodiversity in India achieve their goals through direct contact with local communities rather than through their educational programs or advertising efforts. The Van Panchayat system in Uttarakhand enables local people to control forest resources which ensures that they maintain forest health through active participation in their forest management duties. The Community Conserved Areas (CCAs) documented by Kalpavriksh and other organizations across India demonstrate that communities with resource rights and management responsibilities develop deep, practical biodiversity knowledge through their governance roles.

Pathak Broome and their research team studied over 100 CCAs in India which showed that local communities protected biodiversity in these areas that lay outside official protected sites. The communities knew about species ecology and their habitat needs and potential dangers because they had experienced stewardship work instead of learning from external educational programs. This is an important insight: awareness follows engagement. When you provide communities with important responsibilities for controlling conservation activities, their understanding of conservation matters will grow naturally.

4.3 Indigenous Knowledge and Formal Integration

Indigenous people from India who belong to Scheduled Tribes and live in forests maintain traditional ecological knowledge which has been passed down through their ancestral heritage. The Bishnoi community of Rajasthan protects blackbuck and khejri tree through their conservation methods which were developed from their religious and cultural beliefs that exist since ancient times. The Dongria Kondh communities in Odisha possess detailed knowledge of the plant biodiversity of the Niyamgiri Hills that has provided scientists with research material about the region's native plant species.

The practice of indigenous knowledge integration into conservation awareness programs establishes stronger scientific foundations while enhancing cultural respect for conservation efforts in communities that distrust government environmental projects. The Nagoya Protocol from the Convention on Biological Diversity which India has ratified establishes an international system to recognize traditional knowledge holders and provide them with compensation although India implements this system in an inconsistent manner.

V. Gaps, Barriers, and Critical Challenges

5.1 The Rural-Urban Knowledge Divide

The Indian biodiversity system faces its toughest structural problem because urban conservation practices have developed different standards from the actual ecological conditions which exist in rural areas. Indian conservation policy development occurs in Delhi where officials use English to create policy frameworks that fail to address the needs of agricultural and fishing populations. Conservationists in cities and farmers who need to prevent elephants from entering their

fields have different perspectives about wildlife corridors which stop elephants from raiding crops.

The disconnected system produces negative effects which impact the world. Community-supported conservation efforts face three main challenges which include resistance, non-compliance, and political vulnerability. Resource waste occurs when awareness campaigns fail to reach their target audiences. India needs to develop authentic conservation awareness through communication methods that match its extensive social and cultural and linguistic and economic variations and execute multilingual and local approaches which focus on actual understanding and message distribution.

5.2 Funding and Institutional Gaps

India needs to allocate more funds for biodiversity protection efforts and educational initiatives because their current spending does not match the extensive environmental problems they face. The Wildlife Institute of India (WII) serves as India.s main research and training center for wildlife but operates with a basic financial allocation. State forest departments which serve as the main organizations for biodiversity protection face challenges because they lack enough personnel and necessary resources. The success of environmental education programs in schools depends on teachers who take the initiative to teach environmental issues because schools do not provide organized assistance for these programs.

The civil society organizations Kalpavriksh WWF-India BNHS WCS India and other groups conduct awareness and outreach activities to address important awareness gaps but their operations face challenges because their funding and geographic boundaries limit their ability to create national impact.

As shown in Figure 2, the institutional landscape for biodiversity awareness in India involves multiple overlapping sectors whose coordination remains a persistent challenge.

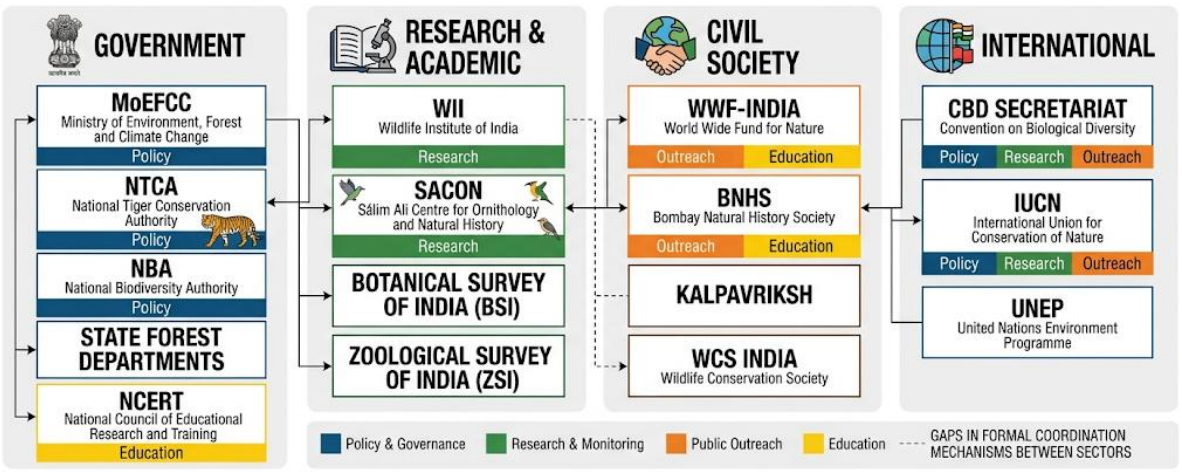

Figure 2: Institutional Landscape for Biodiversity Conservation Awareness in India: Key Actors and Their Primary Roles

The organizational map shows major institutions which are divided into four sectors. The government sector includes MoEFCC NTCA NBA State Forest Departments and NCERT. The research and academic sector includes WII SACON Botanical Survey of India and Zoological Survey of India. The civil society sector includes WWF-India BNHS Kalpavriksh and WCS India. The international sector includes CBD Secretariat IUCN and UNEP. The map uses color-coded function categories to show their main roles in biodiversity education about their institutions. The connecting lines display how organizations work together while showing how much the institutional ecosystem extends and how much formal sector coordination systems are missing. The map uses institutional authority which the National Biodiversity Action Plan (MoEFCC 2014) describes and it uses institutional information from the National Biodiversity Authority annual report (NBA 2020).

VI. Conclusion

India lacks complete biodiversity conservation awareness because the country still needs to establish proper biodiversity conservation practices. The existence of this practice appears in different manifestations which show different distribution patterns among different communities and which people pass down through their cultural heritage and actual institutions and which they

transmit through all methods from traditional oral history to contemporary Instagram reels. The challenge is not starting from zero. The challenge requires establishing connections between traditional knowledge and scientific monitoring and between school education and field experience and between urban concern and rural stewardship and between government policy and community practice.

India has exceptional biodiversity but it faces severe threats to its natural heritage. The solution to that problem needs three components which include policy measures and financial resources and legal enforcement mechanisms. The population must understand the dangers because they need to comprehend what will happen in order to feel their personal connection to the results. India needs to establish understanding through awareness which requires people to engage with information instead of using messaging methods to deliver knowledge. The communities which surround India's biodiversity regions function as essential partners who support conservation efforts. The students in India's classrooms are its most important conservation future. The current awareness and education systems in the country need to provide better support for both of them because both of them need more than what they currently receive.

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