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Understanding Traditional Knowledge and Biodiversity: A Study of UNESCO's Man and Biosphere Program in India

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Abstract

Biodiversity has emerged as a central object of global environmental governance, crystallising multiple scientific, economic and ethical concerns around the conservation and use of nature. Among the international organisations engaged with biodiversity, the United Nations Educational, Scientific & Cultural Organisation (UNESCO) occupies a distinctive position because it explicitly links nature and culture, scientific research and traditional knowledge, and conservation and development. This article analyses UNESCO's Man and the Biosphere (MAB) Programme as a key institutional site where these linkages are configured, with particular attention to the biosphere reserve model and its implementation in India.

Drawing on critical literatures on knowledge, power, and biodiversity, as well as on political ecology and global governance, this article attempts to conceptualise biosphere reserves as discursive-institutional nodes where global norms, state agendas, and local practices intersect. The article argues that the UN's discourse on biodiversity reshapes the image and governance of biodiversity through the biosphere reserve model; that cooperation with other international actors enhances but also conditions the effectiveness of these reserves; and that the institutional nature of biosphere reserves creates structural limits for sustainable and just management

Keywords: Traditional Knowledge, UNESCO, India, Biodiversity, environmental governance

Introduction

Since the early 1970s, the biosphere reserve model developed by the United Nations Educational, Scientific, and Cultural Organisation (UNESCO) has provided a set of high ideals for regional sustainable development. Biosphere reserves are geographic areas that contain globally unique ecosystems and are designated by UNESCO as such. Each biosphere reserve is intended to fulfil three integrated functions: conservation of biodiversity, sustainable economic and human development, and capacity building for research, monitoring, education and training (UNESCO, 2000). Biosphere reserves were selected for this study because they provide powerful models of community-based sustainable development.

As grassroots initiatives, biosphere reserves involve multiple communities within a shared landscape in their pursuit of UNESCO designation. It places unprecedented international attention on regions to pursue bioregional solutions for conservation and sustainable development. The experiences of the past few decades have shown that the pace of human interventions in the ecosystems has accelerated manifold, leading to a loss of wildlife, biodiversity and wilderness over time. The steady decline in biodiversity has led to the extinction of numerous species. It has serious economic and social costs for any country (Hannah & Lohse, 1993; Mittermeier, 1988); thus, it has now been recognised that the conservation and sustainable use of biodiversity are fundamental. The concept of protected areas (PAs) for the conservation of wild species of fauna and flora has undergone significant changes since the establishment of Yellowstone National Park in the United States of America in 1872. Central to this concept was the approach of non-interference and public access to enjoy nature. Furthermore, it was recognised that the ideal approach for conservation is to preserve the health of the overall ecosystem, including

the diversity of species, which can be best accomplished by integrating it into the fabric of social, environmental, and economic contexts. These considerations led to the origin of the concept of the biosphere reserve (BR).

The initiation of BRs goes back to the 'Biosphere Conference' organised by UNESCO in 1968. This was the first intergovernmental conference to examine the reconciliation of conservation and the use of natural resources, thereby foreshadowing the present-day concept of sustainable development. This conference led to the creation of the 'Man and the Biosphere (MAB) Programme of UNESCO in 1970. It aimed to facilitate the resolution of increasing conflict between the people and protected areas. BRs, today, are addressing perhaps the biggest challenge in conservation: how to conserve biodiversity while still meeting the needs of local communities in a socially and culturally sensitive manner. The idea to develop this 'non-conventional' PA first took shape in 1974, within the framework of UNESCO's international research programme on MAB (Umesh Kumar, 2019, p. 87)

Biosphere reserves are designated areas that are intended to combine three interlinked functions: conserving biodiversity, supporting sustainable economic and human development, and serving as sites for research, monitoring, education, and training. They are structured through a zoning system—comprising core, buffer and transition areas—that is intended to reflect differentiated levels and types of human use. As such, they can be read as spatial technologies that organise human–nature relations and as institutional devices that embody particular ideas about knowledge, participation and governance.

India presents a particularly revealing context for examining the role of UNESCO and the UN more broadly in biodiversity governance. The country hosts a significant share of global biodiversity – roughly eight per cent – on a small fraction of the world's land surface, about 2.3 per cent, and encompasses parts of four recognised biodiversity hotspots. Indian biosphere reserves are located in landscapes where dense human populations, long histories of customary resource management and contested conservation interventions overlap. These reserves thus constitute arenas where global norms and local practices meet, conflict and sometimes hybridise.

This paper primarily aims to understand the United Nations' engagement with biodiversity, focusing on UNESCO's MAB Programme and biosphere reserves in India. It addresses three research questions: Why did biodiversity and biosphere reserves become issues at the UN, and what historical and political dynamics shaped this process? What strategies do they employ in governing and managing these sites? Lastly, how does UNESCO, in interaction with national and local actors, identify, monitor and implement its policies in Indian biosphere reserves?

These questions are linked to three working hypotheses. First, the UN's discourse on biodiversity, articulated through programmes such as MAB, is reshaping how biodiversity is imagined and governed by recasting it through the biosphere reserve model. And, the institutional design of biosphere reserves, including their zoning structure and reporting requirements, imposes limits on the scope for locally driven, sustainable management.

By bringing critical theories of knowledge and power into conversation with empirical analysis of UNESCO and Indian biosphere reserves, the article aims to contribute to three bodies of scholarship. It enriches critical biodiversity studies by examining how global discourses are materialised in specific institutional forms. It adds to the literature on global environmental governance by analysing how a non-regulatory UN agency shapes norms and practices through soft law, networks and epistemic infrastructures. It speaks to debates on traditional knowledge, indigenous rights, and conservation in the Global South, highlighting the tensions and synergies between international biodiversity agendas and situated knowledges.

The next section outlines the theoretical and conceptual framework, drawing on debates around knowledge, power and biodiversity. This is followed by a discussion of UNESCO's MAB Programme and the biosphere reserve model, situating them within their historical and institutional context. The article concludes by reflecting on the

broader implications for understanding UN-led biodiversity governance and for the future of biosphere reserves as sites of socio-ecological experimentation.

Knowledge, Power and Biodiversity: Theoretical Perspectives

Over several decades, environmental pollution, biodiversity loss and the destruction of local livelihoods have become imperative global concerns. Green movements and political parties have mushroomed around the globe, raising public awareness of the ecological crisis (Vadrot Alice, 2014). As a result, debates on biodiversity and biodiversity knowledge have expanded in new dimensions within policy debates.

The development of knowledge about nature has progressed through several phases. What is imperative here is to understand the role of knowledge concerning nature, because knowledge has been a tool for hegemonically taking hold of the world, and as a process, due to power struggles and the exercise of power (Foucault, 1975, p. 36). Therefore, it is essential to comprehend the relationship between knowledge and politics. In his Socratic dialogue 'Politicos', Plato demonstrated to what extent the possession of political power requires specialised knowledge and how those who possess political power embody and represent such knowledge (Plato, 1921). Michel Foucault argues that the formation of scientific knowledge about biology was linked to the development of agriculture, in order to cultivate life forms (Foucault, 2005). In this respect, human practices and their interaction with animals, plants, fungi, and other living organisms are linked to human abilities to observe and categorise nature (Vadrot Alice, 2014). Oksanen (2004) argues that 'whatever we think about the origin of this ability, we must admit that humans need organisms for food, fibre, medicines, and tools. The ability of indigenous people to classify plants generates knowledge about the role of the plant in the ecosystem. They employ their own taxonomy, encourage introgression, record data and name their varieties (Lamola, 1992, p. 3).

In this article, the concept of knowledge–power is used to frame UNESCO's role in biodiversity governance. UNESCO does not wield coercive authority in the manner of a state, nor does it manage binding treaties like the CBD Secretariat. Instead, it operates through soft instruments: convening experts, producing guidelines, and legitimising particular understandings of biodiversity and appropriate management practices. The MAB Programme and biosphere reserves are thus understood as assemblages that stabilise certain knowledge–power configurations around nature.

The Social Construction and Politicisation of Biodiversity

The notion of biodiversity encompasses different views on its characteristic features: natural communities, its global totality, or mapping the regions where biodiversity is most concentrated (Lovejoy, 1997, p. 7). In other words, since the introduction of the term, scholars have been concerned with a definition of biodiversity, how to study, use and preserve it, and whether and how to 'put a value on biodiversity (Ehrenfeld, 1988). Biodiversity (Wilson, 1988) and Biodiversity II (Reaka-Kudla et al., 1996) already provide a useful overview of the variety of forms in which biodiversity is understood, studied, and communicated. Edward O. Wilson raises the challenges raised by the term and the concept of biodiversity as such; in his view, biodiversity is 'everything' (Wilson 1996: 1). Since its coinage in the 1980s, the notion of biodiversity has been subject to intense scrutiny and debate. Scholars have traced the emergence of the term to scientific concerns about species loss, the institutionalisation of conservation biology, and the need for an umbrella concept that could galvanise political attention and funding. Works such as those by Wilson and edited volumes like Biodiversity and Biodiversity II catalogue the many ways in which biological variety can be conceived, measured and valued. The recognition of 'biodiversity science' and 'biodiversity studies', the identity of biologists as holists, and the formation of physical and institutional

knowledge infrastructure. Furthermore, politically significant developments have occurred, including the emergence of biodiversity as a central policy issue at the 1992 Rio Environmental Summit and the establishment of the Convention on Biological Diversity (CBD), which entered into force in 1993.

Gorg and Brand relate the different ways about how biodiversity is understood to different perceptions of nature and state that in the field of biological diversity widely varying concepts of nature meet (depending on the viewpoints on ecosystems, species or genetic resources; from untouched nature or the "natural wealth of the tropics" to the utility of genetic resources), but also widely varying social relationships with nature (Gorg and Brand, 2000, p.378). This adds a new social and political dimension to the study of 'knowledge on biodiversity' that goes beyond the traditional discussion of biodiversity loss. Indeed, since the term biodiversity was coined, its introduction, use, and integration into research programs and disciplines have been challenged from various perspectives; in his article 'Whose knowledge, whose nature' Arturo Escobar argued that biodiversity does not exist in an absolute sense (Escobar, 1998: p.55). The social construction of the phenomenon, its empty content and its politicised nature have all been criticised.

In 'The Idea of Biodiversity: Philosophies of Paradise', Takacs addressed the social construction of biodiversity, analysing the different views of conservation biologists on the concept of biodiversity and on the relationship between nature and culture. He argues that biodiversity is a 'scientized synonym for nature', building upon scientific facts as well as political and ethical arguments for the preservation of nature (Takacs, 1996, p. 106). He concludes that conservation biology emerged as a 'new synthetic discipline that incorporates everything, and this is a result of the concern of conservation scientists, who sought to provide strong arguments in favour of the conservation of nature (Takacs, 1996, p. 75). Furthermore, he holds that biodiversity symbolises missing knowledge about the elements of nature's diversity, the mechanisms that produce life's variation, and their importance to human beings. Through 'a determined and vigorous campaign by a cadre of ecologists and biologists over the past decade, biodiversity has become a focal point for the environmental movement' (Takacs, 1996, p.1) - biologists are political actors that actively engage in agenda setting for the conservation of nature and the new term, biodiversity, has helped them to do so.

Along the same lines, Flitner views the term biodiversity as a catch-all phrase that encompasses nearly everything (Flitner, 1999, p. 53). It resembles, in the meantime, a magic formula that addresses ecological problems and enables them to connect to various research fields as well as non-scientific discourses. 'It provides a fresh appeal to those scientific disciplines, such as taxonomy, that lately were the epitome of fusty, only remotely applicable ground research' (Flitner, 1999, p. 53).
Oksanen sees biodiversity as a 'buzzword, that is, a current fashionable expression or a catchword' (Oksanen 2004: 4). Furthermore, many think that the term biodiversity often replaces older concepts such as 'conservation', 'life', 'nature' or 'wilderness' (Reaka-Kudla, 1996). Besides the struggles and challenges among the disciples and approaches to men. The concept enables researchers to examine the social construction of environmental problems stemming from the way we utilise natural resources (Oksanen, 2004). Hence, social sciences, political sciences and the humanities come into play. Biodiversity governance necessitates establishing a connection between resource politics and policies and nature conservation. Biodiversity knowledge production needs to take this into account (Flitner, Gorg and Feins 1998; Brand and Gorg 2003; Brand 2010). Biodiversity issues are addressed from the perspective of reconciling the economy and ecology. In the late 1980s, it was anticipated that this would lead to new challenges in defining the scope of biodiversity knowledge and science (Norton, 1987; Daly & Townsend, 1993; Pearce & Moran, 1994).
The politicisation of biodiversity accelerated in the context of the CBD, which reframed it as both a conservation concern and a matter of economic use, access, and benefit sharing, as well as technology transfer. Conferences and reports in the late 1970s and 1980s, such as the Global 2000 Report to the President and meetings funded by the German Environment Ministry, explored biodiversity not only as an ecological issue but also as a "soft

security" matter with implications for national economies and global stability. Property rights, genetic resources and national sovereignty became central themes, and biodiversity was increasingly tied to questions of development, trade and intellectual property.

Politicizing Biodiversity

In 1992, the German Environment Ministry (BMU) financed a conference titled 'Values of Diversity: Biological Diversity as an Interdisciplinary Research Field' in order to clarify the type of scientific research that was needed to address the complexity deriving from the thematic scope of the CBD. The CBD shifted from its initial role as an umbrella convention concerning existing nature conservation measures to an agreement covering, at the same time, the economic use of natural resources, access and benefit-sharing resulting from this use, and the related frameworks for technology transfer (Gorg, 1999, p.9).
The CBD had an impact on both national and international research programmes. Michael Flitner provides an in-depth analysis of the genesis and development of the term biodiversity, examining the political interests involved. He argues that it remains unclear whether the introduction of the term points to a new research programme, a physical object, or a new (potentially holistic) perspective on nature (Flitner, 1999, p.52). He criticises the fact that most epistemological, philosophical or natural scientific studies analyse the development of the term with a focus on its evolution after the 1970s. Flitner emphasises the significance of examining the developments that have shaped the concept of biodiversity science and politics, even before the term 'biodiversity' was coined.
Flitner shows that biodiversity issues were already discussed before the term was officially introduced in the scientific and political debate, at least in certain circles (Flitner 1999: 56). He takes the 'Global 2000 Report to the President as an example. The report explicitly refers to the role and scope of biological diversity as a so-called 'soft security issue' (Vadrot Alice, 2014). At the time, the consequences of deforestation for climate change and its negative impact on national economies were underestimated, as were the potential benefits of conserving biological resources.

Flitner argues that the term biodiversity was used in a political sense and opened the discussion about many of the issues at stake. In short, the report is based on an economic perspective on biological diversity, coupled with the argument of the 'tragedy of the commons', which refers to the appropriation of resources belonging to the general public for cultivation and management. The logic of the report suggests that these resources can only be conserved to the extent that property rights are clearly defined.
Two major issues of interest are relevant to this: international maritime law and the issue of genetic resources within the framework of the agricultural use of biological diversity. Both issues, among many others, played a role in the establishment of the Biosphere Reserves and the CBD, as well as the increasingly important role of NGOs. Subsequently, another issue became central, namely how to deal with the rights and knowledge of indigenous communities, the struggles over prestige between different biosciences, and, last but not least, the issue of how to deal with the 'common heritage of mankind principle' in legally-binding multilateral agreements.
These issues related to biodiversity have a significance that facilitates an understanding of the political dimension of the concept. The political arena is characterised by the diverging interests of social actors regarding the use of natural resources and nature conservation, and, as a result, the definition of the framework that structures the research field. This framework, in turn, defines the requirements of policy-makers for the concepts and instruments needed for the governance of biodiversity in legal, ethical and economic terms. Here, the issues include access to natural resources, property rights, genetic resources and national sovereignty. Furthermore, it reflects the implicit and explicit interests of the involved scientists in promoting the importance of their research, as well as the moral imperative to conserve nature that is supposed to guide their work and policy involvement (Takacs, 1996).

The broadening of the scope of biodiversity issues, largely due to the outcomes of the CBD in 1992 and the establishment of the first transboundary Biosphere Reserve, clearly necessitated a broadening of the disciplines. Following a conference organised by the German Environment Ministry (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit - BMU), leading German scholars showed the complexity of the scientific knowledge required to tackle the issue (Gorg et al., 2000). Interdisciplinarity came explicitly into play. It is entrenched in the political dimension of biodiversity knowledge.

To combine the natural and social sciences with a view to improving human livelihoods and safeguarding natural and managed ecosystems, thus promoting innovative approaches to economic development that are socially and culturally appropriate and environmentally sustainable (UNESCO, MAB programme), the UNESCO established Man and Biosphere Programme (MAB) in 1971 to develop the basis within the natural and social sciences for the rational and sustainable use and conservation of the resources of the biosphere and for the improvement of the overall relationship between people and their environment. These debates treat biodiversity as a contested and political category rather than a self-evident object. Biosphere reserves are seen as one of the institutional forms through which particular understandings of biodiversity – as something that can be zoned, monitored, valorised and governed – are enacted.

Traditional knowledge, Indigenous Peoples and Biodiversity Governance

A further crucial dimension of contemporary biodiversity politics concerns traditional and indigenous knowledge. Recognition of this knowledge has grown in international forums, particularly with regard to the CBD, which includes provisions on traditional knowledge and benefit sharing. Yet power asymmetries persist in whose knowledge is codified, standardised and translated into policy. Conservation and development interventions frequently treat local knowledge as a resource to be extracted and integrated into existing scientific frameworks rather than as an alternative epistemology that might challenge underlying assumptions about nature and society.

UNESCO has been a significant actor in the discursive recognition of traditional knowledge, often framing it as intangible cultural heritage and as a resource for sustainable development. Through MAB, it has promoted the idea that biosphere reserves should function as sites where scientific and traditional knowledge interact to inform adaptive management.

UNESCO's Man and the Biosphere Programme and the Biosphere Reserve Model

The UNESCO MAB programme introduced the concept of Biosphere Reserves (BRs), which serve as representative samples of biodiversity conservation, encompassing a variety of natural and human-managed ecosystems within a larger ecological landscape unit. The BRs were suggested to have the following objectives: a conservation role (conserving biodiversity at all levels, from subspecific to landscape); a research and monitoring role as part of a larger international network; and a development role aimed at improving the quality of life for local communities living in and around the BRs. This approach, therefore, necessitated some degree of zoning, with a core zone, as distinct from a buffer zone, clearly delimited for the management of the reserves. The buffer zone and a transition zone extending to the periphery, involving all the human population, will consider conservation in conjunction with sustainable development. Although ideally, the core zone is left free of human influences, in reality, in the Asian region, where population pressure often tends to be very intense, even the core zone may not be free from human interactions, albeit at a reduced level (Ramakrishna, 2002). Meanwhile, the concept of 'sustainable development' was articulated by the world's first Commission on Environment and Development in 1987, through the now-famous Brundtland Report, entitled 'Our Common Future'.

Sustainable development is now seen as that process of development aimed to meet 'the needs of the present generation without compromising the ability of future generations to meet their own needs Arising out of these developments, what has now come to be known as the 'Seville Strategy' (UNESCO, 1996), which is identified as clear-cut criteria for BRs and their management, refined on the basis of experience, with clear-cut criteria identified. The BR concept became, in a sense, one of the significant testing grounds for linking conservation with sustainable livelihood needs of local communities in the short-term time frame and sustainable development of the region as part of a long-term strategy (Ramakrishnan, 2002)

Historical emergence and objectives

UNESCO's Man and the Biosphere Programme have its origins in broader international discussions during the 1960s about the relationships between human society and the biosphere. The 1968 Biosphere Conference, convened under UNESCO auspices, represented one of the first intergovernmental gatherings to address the reconciliation of conservation with resource use. This conference anticipated later conceptions of sustainable development by emphasising the need to integrate ecological knowledge with social and economic planning. In 1970, UNESCO officially launched the MAB Program as an interdisciplinary research initiative aimed at understanding human–environment interactions and providing a scientific basis for the rational and sustainable management of the biosphere's resources. As time unfolded, the program evolved from a research portfolio into a more integrated platform that connected natural and social sciences, with the objectives of enhancing human well-being while preserving both natural and modified ecosystems.

A central institutional innovation of MAB was the biosphere reserve concept, developed during the 1970s as a model for areas designed to combine conservation, sustainable use, and logistical functions such as research and education. It was envisaged that biosphere reserves would be representative samples of major ecosystems, incorporating both relatively undisturbed areas and zones of human use. This contrasted explicitly with earlier paradigms of protected areas, which focused on non-interference and excluded human use from core conservation sites.

The biosphere reserve model is based on a three-zone configuration: a strictly protected core area, a surrounding buffer zone in which limited, sustainable uses and research activities are permitted, and an outer transition area in which a range of economic and social activities occur under conditions guided by the principles of sustainability. Three key functions are underpinned by this spatial arrangement:

- Conservation of genetic resources, species, and ecosystems.
- Development, understood as the promotion of sustainable economic and human activities that support local communities.
- Logistics support for research, monitoring, education, and training relevant to conservation and development.

The zoning aims to manage gradients of human impact while maintaining linkages between ecosystems and human societies. In theory, core zones protect biodiversity and ecological processes; buffer zones mediate interactions between conservation and use; and transition areas provide space for experimenting with sustainable development practices. In practice, demographic pressures and historical land-use patterns often render even core areas susceptible to some degree of human use, particularly in regions such as South and Central Asia. Traditional practices, such as shifting cultivation, grazing, or the collection of non-timber forest products, may persist in or around core zones, complicating strict protection models and raising questions about the compatibility of these

practices with long-term conservation goals. India offers a unique setting for UNESCO's biodiversity engagement, with its rich flora and fauna.

India as a site of UNESCO biodiversity engagement

India harbours extraordinary ecological diversity. Its territory spans the Himalayan ecosystems, the Indo-Gangetic Plain, central and eastern forests, western deserts, and extensive coastal and marine zones. This relatively small land area supports a significant portion of global biodiversity and parts of four recognised biodiversity hotspots, and hence is considered a priority region for conservation science and policy. At the same time, India is home to a large and socioeconomically diverse population whose livelihoods are inextricably linked with land, forests, and water. Agrarian communities, forest-dependent groups, and Indigenous peoples, including Adivasis, have developed numerous forms of environmental knowledge and effective resource management practices. Conservation initiatives, from colonial forest policies to post-independence wildlife protection, have often led to conflicts over access, displacement, and the limitation of traditional practices. India has established several biosphere reserves that reflect its rich ecological and cultural diversity, encompassing a range of ecosystems, from mountainous regions to forests, wetlands, and coastlines.

These sites are part of UNESCO's World Network of Biosphere Reserves and, at the same time, form a part of national protected-area systems and forest-governance structures. Biosphere reserves in India are not uninhabited spaces; they overlay landscapes with pre-existing legal categories, such as national parks, wildlife sanctuaries, reserve forests, and community lands, and with histories of land claims and social mobilisation. As a result, many reserves contain villages, sacred groves, shifting-cultivation areas, or community forests that predate the biosphere designation. This leads to complicated governance configurations in which state agencies, local councils, traditional authorities, nongovernmental organisations, and sometimes private actors interact. Examining biosphere reserves in India provides an opportunity to analyse how UNESCO's global frameworks are interpreted, adapted, or resisted within a postcolonial federal polity characterised by multi-level governance and pronounced socioeconomic inequalities. It also allows analysing how traditional and Indigenous knowledge is mobilised, negotiated, or sidelined in the name of biodiversity and sustainable development.

This paper aims to address a central analytical question: how UNESCO's policies and expectations regarding biosphere reserves are identified, monitored, and operationalised within the Indian context, and what implications arise for traditional knowledge and local livelihoods. UNESCO's continental reach is mediated predominantly through site designation processes, periodic reporting, and inclusion in the World Network. Candidate sites are required to satisfy defined criteria and be supported by documentation relating to ecological values, zoning, legal status, and management arrangements. Following designation, biosphere reserves are expected to submit periodic reports detailing progress in conservation, development, and logistical functions, as well as in governance and participation.

Based on UNESCO expectations, national authorities in India develop guidelines and management plans that outline the work and responsibilities of various agencies and stakeholders. Plans for biosphere reserves typically outline core, buffer, and transition zone boundaries, enumerate activities permitted and prohibited, describe research and monitoring programs, and designate local development projects. They may also include provisions for advisory committees or eco-development committees, which, in principle, provide a voice for local communities. Authorities also conduct empirical work in selected Indian biosphere reserves, which can shed light on how such arrangements function in practice.

Conclusion

This paper examines the UNESCO Man and the Biosphere Programme and the biosphere reserve model as key mechanisms through which the United Nations engages with biodiversity, with a particular focus on the case of India. Locating biosphere reserves within larger debates related to knowledge, power, and biodiversity, this paper argues that such sites serve not as conservation areas per se but as complex discursive institutional configurations through which ecological and social relations are arranged. UNESCO draws on soft norms and epistemic authority, while states have sole control over the legal frameworks and enforcement; local communities manoeuvre within such structures to protect their livelihoods and obtain recognition.

The discussion of monitoring and implementation in Indian biosphere reserves suggests that the biosphere reserve model simultaneously enables and constrains possibilities: it enables opportunities for integrating conservation and development, recognising traditional knowledge, and experimenting with participatory governance

Taken together, the findings in this chapter support three hypotheses: that the United Nations discourse reconfigures the image and governance of biodiversity through the medium of biosphere reserves; that cooperation with other intergovernmental actors enhances their effectiveness, but at the same time, the institutional character of biosphere reserves imposes structural limits on their sustainable and just management. This means, for both critical biodiversity studies and global governance scholarship, a greater attention is needed regarding how soft-law instruments, epistemic networks, and spatial planning technologies shape power relations on the ground.

In terms of policy and practice, there is a need to transcend mere rhetorical acknowledgement of traditional knowledge in favour of more substantive approaches to governance and the sharing of authority. This might involve enhanced community rights within core and buffer zones, reformulation of monitoring regimes to include indicators for cultural conservation and knowledge reproduction, and the creation of stronger local decision-making mechanisms within biosphere reserve governance structures. Finally, in view of the current debates on decolonising conservation and environmental governance, there is a need to consider how UNESCO and other United Nations bodies might reconfigure their programmes to more directly confront historical and contemporary injustices. Biosphere reserves represent promising yet ambivalent arenas for such transformations because they were explicitly designed to connect global norms with local realities.

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