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The Integration of India's Fisheries Sector into People's Biodiversity Registers: A Technical Framework for Conservation and Sustainable Management

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The People's Biodiversity Register (PBR) stands as a cornerstone of India's commitment to the conservation of biological diversity, its sustainable utilization, and the equitable sharing of benefits arising from genetic resources, as articulated by the Biological Diversity Act (BDA) 2002. This decentralized documentation tool, prepared by local Biodiversity Management Committees (BMCs), extends its mandate to encompass the rich and diverse aquatic resources that form the backbone of India's fisheries sector. Integrating comprehensive fisheries data into PBRs is crucial for reflecting the sector's ecological significance, traditional knowledge, and its integral role in rural livelihoods, thereby advancing both conservation objectives and socio-economic empowerment.

Legal and Policy Foundations for Aquatic Biodiversity Documentation

The BDA 2002, supported by subsequent amendments and operational guidelines from the National Biodiversity Authority (NBA), mandates the creation of PBRs to document local biodiversity and associated traditional knowledge (TK). This framework emphasizes community participation, often through methods like Participatory Rural Appraisal (PRA), with technical guidance provided by district-level Technical Support Groups (TSG). For the fisheries sector, this legal imperative means that all forms of aquatic biological resources from marine fish to freshwater flora and fauna, and associated traditional practices must be systematically recorded. PBRs serve as vital legal documents, establishing the sovereign rights of BMCs over these documented resources and validating traditional knowledge as 'prior art,' which is essential for Access and Benefit Sharing (ABS) mechanisms when biological resources are utilized commercially or for research.

Overview of India's Fisheries Sector

India's aquatic ecosystems are among the most diverse globally, hosting over 2,800 indigenous fish and shellfish species, with 917 from freshwater, 394 from brackish water, and the remainder from marine environments. This vast ichthyofaunal diversity is sustained across extensive freshwater resources, including 197,204 km of rivers and canals, 2.25 million hectares of ponds and tanks, and 2.09 million hectares of lakes and reservoirs, alongside significant brackish and marine environments.

The fisheries sector is a critical component of India's economy, providing livelihoods to nearly three crore people, particularly in marginalized communities. Inland fisheries and aquaculture collectively contribute over 75% of the nation's total fish production, underscoring the dominance of farming systems over capture fisheries. This significant contribution highlights the necessity for meticulous documentation within PBRs to ensure sustainable management and equitable benefits.

Core Components of Fisheries Documentation within PBRs

The technical framework for PBRs requires comprehensive documentation of India's diverse aquatic resources and associated human interactions. This includes detailed entries across various categories:

Freshwater Resources and Culture Systems

Documentation within PBRs must systematically list native species pivotal to freshwater aquaculture, such as the Indian major carps (*Catla catla*, *Labeo rohita*, *Cirrhinus mrigala*). Beyond species lists, PBRs should meticulously detail traditional and modern culture practices. Examples include the unique sewage-fed fish culture systems predominantly found in West Bengal, which involve specific input levels and management techniques, or the running water/raceway culture common in hill streams. Information on air-breathing fishes (*Clarias batrachus*, *Heteropneustes fossilis*) and commercially important crustaceans (*Macrobrachium rosenbergii*) should also be recorded.

Brackish and Marine Resources

Coastal Biodiversity Management Committees (BMCs) are tasked with documenting resources managed through traditional brackish water systems such as the *bheries* of West Bengal and the *Pokkali* fields of Kerala. For marine environments, PBRs must include commercially significant species, document historically utilized fishing gears (e.g., ring seines, trawls, gill nets), and identify major landing centers. This data is crucial for understanding historical patterns of exploitation and the current status of resources.

Conservation Status and Endemism

A technically rigorous PBR must include the conservation status of locally significant species. This involves identifying endemic fish species classified as Near Threatened (NT), Vulnerable (VU), or Endangered (EN) under IUCN criteria. For instance, species like *Clarias magur* (Magur) are recognized as Endangered in certain riverine contexts, while others such as *Anguilla bengalensis* (Indian Mottled Eel) and *Ailia coila* (Gangetic Ailia) are Near Threatened. Documenting these threat levels directly informs local conservation planning and interventions.

Methodological Considerations and Challenges in Data Collection

Integrating fisheries data into PBRs presents unique methodological challenges, primarily due to the mobility of aquatic resources and the often-oral transmission of specialized fishing knowledge. BMCs must employ participatory approaches to engage key informants, including experienced fishers, traditional knowledge holders, and local community elders, to collect and validate information. This community-sourced data should then be cross-referenced with scientific findings from institutions such as the Central Marine Fisheries Research Institute (CMFRI) and the Fisheries Survey of India (FSI) to ensure accuracy and scientific rigor. The validated documentation helps in legally preserving locally developed, adaptive management knowledge, akin to the regulation of *chironji* collection in forest areas.

Translating Fisheries PBR Entries into Conservation and Livelihood Benefits

The comprehensive data within fisheries-focused PBRs serves multiple critical functions:

- **Access and Benefit Sharing (ABS):** PBRs provide the necessary 'prior art' documentation for ABS mechanisms, ensuring that benefits derived from the commercial or research utilization of indigenous aquatic genetic resources are equitably shared with the local communities who have conserved them.
- **Environmental Impact Assessments (EIAs):** Detailed PBRs serve as crucial baseline documents, offering comprehensive, localized ecological data that can counter incomplete or fraudulent EIAs for developmental projects impacting aquatic ecosystems. This empowers communities to advocate for the protection of their water bodies and associated resources.

- **Policy Support and Livelihood Enhancement:** By cataloging specific indigenous species and traditional aquaculture practices, PBRs provide invaluable data for government schemes like the Pradhan Mantri Matsya Sampada Yojana (PMMSY) and the Fisheries and Aquaculture Infrastructure Development Fund (FIDF). This supports targeted interventions for seed production, infrastructure development, and genetic improvement programs led by ICAR institutions, thereby fostering the sustainability and economic growth of the fisheries sector.
- **Conservation Action:** The documentation of threatened and endemic species within PBRs directly informs local and regional conservation strategies, contributing to national efforts to protect India's freshwater megafauna and maintain fish biodiversity.

Conclusion

The meticulous and participatory inclusion of India's diverse fisheries sector within People's Biodiversity Registers is indispensable for realizing the overarching objectives of the Biological Diversity Act: conservation, sustainable use, and equitable benefit sharing. From traditional culture systems and endemic species to commercially important marine resources, comprehensive documentation empowers local communities, provides critical data for informed policy-making, and strengthens conservation efforts. Effective implementation necessitates continuous data validation, robust collaboration between BMCs and scientific bodies, and sustained political commitment to ensure that these vital aquatic components are fully integrated into India's national biodiversity documentation and management strategy.

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