

Artigos

Recebido: 09.07.2025

Aprovado: 21.03.2026

Publicado: 05.2026

DOI <http://dx.doi.org/10.18316/REDES.v14i1.12936>

The struggle for clean water access as a Human Right in River Basin Governance in India: An Analysis

*Dr. Aditi Nidhi*ORCID: <https://orcid.org/0000-0002-3141-9635>*Ms. Neha Tripathi*ORCID: <https://orcid.org/0000-0001-6805-2796>*Mr. Atal Mishra*ORCID: <https://orcid.org/0009-0009-8242-087X>

Abstract: The worldwide contest for access to clean water as an essential human right is escalating, especially over river basin management. This study examines the intricacies and obstacles of guaranteeing equal access to clean water in transboundary river basins, where political, environmental, and legal frameworks often conflict with the fundamental rights of impacted communities. Notwithstanding global acknowledgment of water as a human right, its implementation is scattered and uneven, especially in areas, where rivers cross various jurisdictions. Climate change, environmental degradation, and unsustainable development increasingly undermine water equity and ecosystem health. In India, major basins like the Ganges, Brahmaputra, and Indus face severe pollution, biodiversity loss, and erratic flows that disproportionately affect the poor and marginalized. This disconnection underscores the inadequacy of current governance frameworks in effectively addressing the pressing need for clean water and the preservation of ecological sustainability. The chapter analyses how governance frameworks in river basins often emphasize economic and geopolitical considerations at the expense of human rights, leading to the marginalization of vulnerable populations, particularly in developing areas. The article critically assesses case studies to examine how regional agreements, national policies, and local water management practices influence access to clean water. The chapter advocates for the essentiality of inclusive, rights-based methodologies in river basin governance, suggesting alternatives that include human rights into policy frameworks and foster fair water allocation. In conclusion, it necessitates a paradigm change in river basin administration that emphasizes access to clean water as an unequivocal human right for everyone.

Keywords: Clean Water; Human Rights; Ecological Sustainability; River Basin Governance; Water Allocation

A Luta pelo Acesso à Água Limpa como um Direito Humano na Governança das Bacias Hidrográficas da Índia: uma Análise

Resumo: A disputa mundial pelo acesso à água potável como um direito humano essencial está a aumentar, especialmente no que diz respeito à gestão das bacias hidrográficas. Este estudo examina as complexidades e os obstáculos para garantir a igualdade de acesso à água potável em bacias hidrográficas transfronteiriças, onde as estruturas políticas, ambientais e legais entram frequentemente em conflito com os direitos fundamentais das comunidades impactadas. Apesar do reconhecimento global da água como um direito humano, a sua implementação é dispersa e desigual, especialmente nas zonas onde os rios atravessam várias jurisdições. As alterações climáticas, a degradação ambiental e o desenvolvimento insustentável prejudicam cada vez mais a equidade hídrica e a saúde dos ecossistemas. Na Índia, as grandes bacias hidrográficas como o Ganges, o Bramaputra e o Indo enfrentam uma poluição severa, perda de biodiversidade e caudais erráticos que afectam desproporcionalmente os pobres e os marginalizados. Esta desconexão sublinha a insuficiência das actuais estruturas de governação para satisfazer eficazmente a necessidade urgente de água potável e a preservação da sustentabilidade ecológica. O capítulo analisa a forma como as estruturas de governação nas bacias hidrográficas enfatizam frequentemente as considerações económicas e geopolíticas em detrimento dos direitos humanos, levando à marginalização das populações vulneráveis, especialmente nas áreas em desenvolvimento. O artigo avalia criticamente os estudos de caso para examinar como os acordos regionais, as políticas nacionais e as práticas locais de gestão da água influenciam o acesso à água potável. O capítulo defende a essencialidade de metodologias inclusivas e baseadas em direitos na governação das bacias hidrográficas, sugerindo alternativas que incluam os direitos humanos nas estruturas políticas e promovam a alocação justa da água. Concluindo, é necessária uma mudança de paradigma na administração das bacias hidrográficas que enfatize o acesso à água potável como um direito humano inequívoco para todos.

Palavras-chave: Água Limpa; Direitos Humanos; Sustentabilidade Ecológica; Governação das Bacias Hidrográficas e Alocação de Água

Research Methodology

Researchers have used doctrinal methodology related to this research. The methods employed for this study are descriptive and analytical. Data collection for this study involves reviewing existing literature from both primary and secondary sources.

Introduction

As a fundamental human right, the contentions surrounding river basin management has stoked tensions throughout the globe in the demand for access to clean water. This chapter delves into the challenges and complexities of ensuring equitable access to clean water in transboundary river basins, where the rights of affected populations are often at odds with political, environmental, and legal frameworks. Even while water is recognized as a human right on a worldwide scale, its distribution and use are not uniform, particularly in regions where rivers cut across different jurisprudence. Current governance structures fail to adequately address the urgent demand for clean water and the maintenance of natural sustainability, as this mismatch demonstrates.

This chapter examines the ways in which regional agreements, national laws, and local water management practices impact access to clean water. As an option that promotes equitable water distribution and incorporates human rights into policy frameworks, it argues that rights-based procedures that are inclusive are vital for river basin governance.¹ (Uitto & Duda, 2002)

1 Uitto, J. I., & Duda, A. M. (2002). Management of transboundary water resources: lessons from international cooperation for conflict prevention. *Geographical Journal*, 168(4), 365–378. <https://doi.org/10.1111/j.0016-7398.2002.00062.x>

Ultimately, it calls for a sea change in river basin management, with the focus shifting to water purification as an undeniable human right. In developing nations in particular, the research finds that vulnerable people are marginalized since river basin governance frameworks prioritize economic and geopolitical factors above human rights. In order to achieve more fair water management in transboundary rivers, this chapter offers suggestions for “operationalizing” theoretical fairness. The distribution and control of water in transboundary basins has emerged as a significant and ongoing point of contention, especially in light of the fact that over 60% of the world’s freshwater is produced in these areas, and that they are used by over 40% of the world’s population.

The already existing difficulties in guaranteeing equitable access to clean water as a basic human right are likely to be worsened by factors such as climate change, an expanding set of actors, an expanding population, and ineffective management and policy.² (Kar et al., 2020) As a fundamental human right, access to clean water should be ensured for all people via concerted efforts by national and regional governments, NGOs, and private sector businesses. The water community would have a powerful weapon in their arsenal to tackle one of the most basic shortcomings of 20th century progress if individuals would simply recognize a human right to water and pledge to fulfil it for those who are now without it.³ (Von Lossow, 2015)

Fair, open, and transparent decision-making procedures are essential for gaining public approval of these advances. These processes should allow all relevant parties to participate equitably and ensure that no major constituency is left out. A lack of agreement among states on how to translate a set of codified international principles and the necessity to reconcile political borders and basin boundaries to guarantee fair distribution and management of transboundary water resources are the two main obstacles to resolving these issues.

Legal and Ethical Dimension of water as a Human Right

The right to life, the right to health, and the right to a decent quality of living are all directly or indirectly related to the availability of safe drinking water, which is a basic human requirement.⁴ (Noga & Wolbring, 2012) Clean water and sanitation are still big issues in many areas of the globe, even though we’ve come a long way. Disabled people and other oppressed groups suffer much more from this problem.

There has been a slow but steady accumulation of international agreements and declarations confirming the right to water as a human right.

Over time, several international conventions and declarations have acknowledged water as a fundamental human right. The universal importance of access to safe drinking water and sanitary facilities was acknowledged by the United Nations General Assembly in its 2010 resolution, which officially affirmed the right to water and sanitation for all people.⁵ (Khaili, A. et.al., 2018) This acknowledgment has significant ethical and legal ramifications

2 Kar, S., Shiv, A., Panwar, A., Jha, K. N., & Singh, A. (2020). River Water project disputes and their implications. *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, 12(4). [https://doi.org/10.1061/\(asce\)la.1943-4170.0000423](https://doi.org/10.1061/(asce)la.1943-4170.0000423).

3 Lossow, T. von. (2015). Gender in Inter-State Water Conflicts. *Peace Review*, 27(2), p. 196. Taylor & Francis. <https://doi.org/10.1080/10402659.2015.1037628>.

4 Noga, J., & Wolbring, G. (2012). The Economic and Social Benefits and the Barriers of Providing People with Disabilities Accessible Clean Water and Sanitation. *Sustainability*, 4(11), 3023–3041. <https://doi.org/10.3390/su4113023>.

5 Khaili, A. A., Mamari, A. A., Amer, H., & Ibrahim, W. (2018). An Affordable System for Remotely Monitoring Water Quality in Residential Water Tanks 247, 36.

since it requires governments to guarantee that all people under their jurisdiction have access to water that is both readily available and of high quality. Recognizing access to clean water as a basic human right has gained considerable momentum on the global stage. Access to safe drinking water is fundamental to human dignity and the fulfilment of other human rights, water as a human right was also outlined in the Mar del Plata Action Plan, 1977⁶ (Report of the United Nations Water Conference, Mar Del Plata, 14-25 March 1977, 1977) and the 2002 General Comment No. 15 of the United Nations Committee on Economic, Social, and Cultural Rights.⁷ (UN. Committee on Economic, Social and Cultural Rights (29th sess: 2002: Geneva), 2003)

By promoting inclusive policies that give priority to disadvantaged communities, these tools ethically highlight the ideal of equality. Nevertheless, several countries have challenges in turning these pledges into practical policy, even if there is universal agreement on the matter. Millions of people still lack access to clean water because of a lack of political will, limited resources, and disjointed government.

The implementation of laws and practices that uphold this fundamental right, however, has encountered several obstacles. With the recognition of the importance of community engagement and fair access in development strategies and projects in the Global South, water governance has emerged as a pressing concern.⁸ (Sultana F., 2015). The fact that women and girls are disproportionately responsible for bringing water to their homes, which limits their access to other economic, social, and educational possibilities, is another major cause for worry over the gendered aspect of water poverty.

Finally, there are major ethical and legal ramifications to recognizing water as a human right. This is because it mandates that governments provide everyone, especially disadvantaged and vulnerable groups, fair access to safe drinking water.⁹ (UN-Water Decade Programme on Advocacy and Communication and Water Supply and Sanitation Collaborative Council, 2010) A comprehensive strategy for water governance that places a premium on community engagement, gender equality, and the concerns of marginalized groups is essential for the successful achievement of this right, which is still a formidable obstacle.

There are larger social and environmental ramifications to people's rights being violated due to a lack of access to safe drinking water. There is a pressing need for better policies and strategies to tackle the water-related illnesses that continue to impact millions of people, especially in the developing nations. However, more needs to be done to ensure that these global initiatives translate into tangible improvements at the local level, with a focus on empowering communities and addressing the specific needs of marginalized groups.¹⁰ (Adams, E. A., et.al., 2018)

6 *Report of the United Nations Water Conference, Mar del Plata, 14-25 March 1977.* (1977). United Nations Digital Library System. <https://digitallibrary.un.org/record/724642?ln=en>

7 UN Committee on Economic, Social and Cultural Rights (29th sess.: 2002: Geneva). (2003, January 20). *General comment no. 15 (2002), The right to water (arts. 11 and 12 of the International Covenant on Economic, Social and Cultural Rights)*. United Nations Digital Library System. <https://digitallibrary.un.org/record/486454?ln=en> Access on: 10th, October 2024

8 Sultana, F. (2015). Rethinking Community and Participation in Water Governance. <https://doi.org/10.4324/9780203383117.ch27>.

9 UN-Water Decade Programme on Advocacy and Communication and Water Supply and Sanitation Collaborative Council. (2010). The human right to water and sanitation today. In *Media Brief*. https://www.un.org/waterforlifedecade/pdf/human_right_to_water_and_sanitation_media_brief.pdf.

10 Adams, E. A., Juran, L., & Ajibade, I. (2018). 'Spaces of Exclusion' in community water governance: A Feminist Political Ecology of gender and participation in Malawi's Urban Water User Associations. *Geoforum*, 95, 133. Elsevier BV. <https://doi.org/10.1016/j.geoforum.2018.06.016>.

An important step toward achieving social justice and safeguarding basic human rights is the acknowledgment of water as a human right. To fully exercise this right, however, nations, civil society, and the international community must work together to overcome the many obstacles, including those of a legal, ethical, and practical nature, that prevent everyone from having access to this vital resource.

The Indian Constitution and its interpretation by the court have implicitly guaranteed the right to access clean water in India under Article 21 of the Indian Constitution.¹¹ (Kustanto, 2020) There is no mention of the right to water as a basic right in the Indian Constitution. But according to Supreme Court, the right to life includes the right to drink safe water. Since water is a fundamental necessity for all living things, this reading assumes that having access to safe drinking water is critical to achieving a dignified existence. The apex courts in landmark judgments of *Narmada Bachao Andolan v. Union of India*¹² and *Subhash Kumar v. State of Bihar*,¹³ affirmed that water is integral to living with dignity.

Legislation and regulations have been put in place by the Indian government to safeguard and administer water resources, these include the Water Act, 1974 and legal regulations relating to groundwater management by various states.¹⁴ (Nurbaiti & Bambang, 2018) The need to prevent pollution and depletion of water sources and the significance of ensuring that all people have access to clean water are both acknowledged by the existing legal framework. There are still a lot of hurdles to overcome before everyone has access to clean water, even with current existing initiatives.

The scope of water governance goes beyond only managing resources; it also involves more general concerns of social equity and ecological preservation. Those already at a disadvantage have their health, productivity, and standard of living impacted the most by water scarcity.

Access to water for marginalized communities must be a top priority from an ethical standpoint. Equal representation of underrepresented groups in government is essential for equity, and policies that take gender into account recognize that women bear a disproportionate share of the burden of water shortage. Sustainable development cannot be achieved without a rights-based strategy that is firmly built on equality and inclusion. Achieving social justice and sustainability requires the acknowledgment of water as a fundamental human right. Cohesive legislative frameworks, ethical leadership, and inclusive policies are necessary to turn this acknowledgment into real results, however. Water is a basic human right, and states may make good on their commitment by listening to underrepresented groups and creating equal access.

Climate Change and Transboundary Water Governance

Climate change overlays a new set of challenges onto transboundary water conflicts. The IPCC warns that global warming is already making the hydrological cycle more extreme: intense rainfall events and floods are increasing in many regions, even as droughts become longer and more severe in others. In India's river basins, monsoon unpredictability and glacial melt are of particular concern. For example, studies indicate that rising

11 Kustanto, A. (2020). Water quality in Indonesia: The role of socioeconomic indicators. *Jurnal Ekonomi Pembangunan*, 18(1), 47–62. <https://doi.org/10.29259/jep.v18i1.11509>.

12 *Narmada Bachao Andolan v. Union of India*, AIR 2000 SC 3751.

13 *Subhash Kumar v. State of Bihar*, AIR 1991 SC 420.

14 Nurbaiti, S. R., & Bambang, A. N. (2018). Literature Study on community participation in community based rural water supply and sanitation programs. *E3S Web of Conferences*, 31, 09033. <https://doi.org/10.1051/e3sconf/20183109033>.

temperatures have caused Himalayan glaciers to recede, potentially reducing flows in the Brahmaputra by mid-century. In practice, basin states must contend with both enhanced flood risk and declining dry-season flows.

Traditional water treaties and institutions are often ill-equipped for these shifts. The Indus Water Treaty (1960) and the Ganges water-sharing agreements were negotiated under relatively stable historical patterns, without provisions for climate variability. Today, changing flows and increasing disasters test their resilience. Tensions can rise when extreme events occur: lower water availability in dry years may trigger interstate disputes, while catastrophic floods require joint management beyond the scope of old agreements. As one analysis notes, climate change and geopolitical pressure are putting the Indus Treaty “to the test”^{file}. Similarly, India and Bangladesh have struggled to reach a permanent sharing of the Teesta (Tista) River – a dispute aggravated by erratic flows in a changing climate.

Building resilience thus demands innovative cooperation. Basin countries need joint climate-risk assessments and adaptive institutions. For instance, creating shared flood-forecasting systems and real-time data exchange can help pre-empt disaster impacts. Cooperative reservoir operations (where upstream dams release water during downstream floods) are another strategy. Some regions have begun integrating ecosystem-based adaptation: UNESCO and IUCN guidelines recommend measures like conserving upstream forests and wetlands as natural sponges for floodwaters. These nature-based solutions can provide a buffer against variability. Multilateral programs are emerging to support this: for example, the Adaptation Fund’s Mekong EbA project and various UNDP initiatives promote ecosystem restoration as flood management.

In practical terms, policy instruments are being adapted. Nepal, India and Bangladesh have initiated dialogue on joint water data-sharing (e.g. flooding alerts) under the Ganges–Brahmaputra framework. On the India–China border, new memoranda for Himalayan rivers (e.g. a 2013 MoU on trans-boundary rivers) aim to facilitate exchange of flow data, with an eye to future climate surprises. Academics have proposed a “Transboundary Waters Opportunity” approach, which seeks mutually beneficial climate-resilience measures – for instance, multi-purpose watershed development that serves all riparians. Overall, the goal is to shift from rigid water quotas to adaptive governance, where climate projections and ecosystem constraints are integrated into treaty design. This aligns with Sustainable Development Goal (SDG) 13 on climate action and SDG6 on water, which together call for climate-resilient management of transboundary water resources.

A significant development in Indian constitutional jurisprudence came with the Supreme Court’s landmark decision in *M.K. Ranjitsingh v. Union of India* (2024), where the Court explicitly recognized the right against the adverse effects of climate change as an extension of the fundamental right to life under Article 21. The judgment affirmed that the State has a constitutional duty to mitigate and adapt to climate change, and to protect ecological integrity as a precondition for ensuring the right to health, livelihood, and a dignified existence. This ruling strengthens the legal foundation for integrating climate resilience and environmental sustainability into all governance domains, including water management and compels governments to adopt rights-based, climate-sensitive policies in the face of ecological degradation.

Eco-Centric and Sustainable Approaches to River Basin Governance

A promising reform agenda is to foreground ecological integrity in governance. Integrated Water Resources Management (IWRM) is a framework explicitly built on this idea. Globally endorsed (including in SDG target 6.5), IWRM promotes the coordinated development of water, land and related resources “without compromising the sustainability of vital ecosystems.” In practice, this means managing water use with regard to ecosystem needs. For

example, maintaining environmental flows – the minimum river flow required to sustain habitats – becomes a legal and planning priority, rather than an afterthought. According to UNEP, implementing IWRM “helps to protect the world’s environment” while also promoting economic and social welfare. This holistic approach contrasts with piecemeal management (e.g. purely engineering solutions) and is aligned with ethical principles of intergenerational equity.

Incorporating ecosystem services into water policy is another related strategy. Economists and ecologists suggest that valuing functions like flood buffering, water purification, and biodiversity can motivate conservation investment. For instance, an analysis of transboundary basins emphasizes that “well-managed water and related resources” yield broad benefits – from carbon sequestration to wildlife habitat – that are often overlooked. Operationally, this has inspired mechanisms like Payment for Ecosystem Services (PES) schemes, where downstream users pay upstream communities for actions that safeguard water quality. Additionally, basin organizations can use ecosystem indicators (water clarity, fish population indices, wetland area coverage) alongside traditional supply metrics to guide management.

Several international standards underscore these eco-centric goals. The UN Sustainable Development Goals illustrate how water, ecosystem, and climate objectives intersect: SDG6 (clean water) explicitly calls for “sustainable management of water resources, wastewater and ecosystems”. Similarly, the global UN Decade on Ecosystem Restoration (2021–2030) frames waterway revival as part of a triple mission against climate change, biodiversity loss and pollution. India’s *Namami Gange* program has been designated a flagship under this UN Decade, reflecting its ambition to clean urban sewage, revitalize wetlands and replant riverine forests. In concrete terms, the Ganges cleanup initiative has invested over US\$4 billion in infrastructure to stop sewage inflow – including new treatment plants designed to handle roughly 5 billion litres per day. These efforts embody the principle that guarding a river’s health is a public good, integral to cultural values and human rights alike.

Finally, some scholars advocate even more transformative models. The emerging *Rights of Nature* movement, for example, grants legal personhood to rivers so that their ecological interests are represented in courts. While India has not adopted this approach nationally, several state-level environmental laws and judicial orders have recognized that rivers have “legal rights” to water and protection in specific cases. More broadly, effective eco-centric governance will require inclusive institutions like empowered river basin authorities with scientific as well as legal expertise. Such bodies would balance allocations among agriculture, industry, households and the environment, guided by ecosystem targets and international commitments.

Access to drinking water is shaped by the interaction of regional agreements, national policies, and local water management practices, as demonstrated through several illustrative case studies. At the regional level, transboundary arrangements such as the Nile Basin Initiative show how cooperation among riparian states can create frameworks for equitable and sustainable water use through data sharing, joint planning, and conflict prevention. Although political tensions and uneven capacities limit direct outcomes, such agreements establish the legal and institutional conditions necessary for improving water availability and quality. Similarly, supranational frameworks like the European Union’s Water Framework Directive translate regional norms into binding obligations, compelling member states to adopt river basin-level planning and strict water quality standards. These regional mechanisms, while not always directly delivering water, play a crucial role in shaping national priorities, mobilizing investment, and safeguarding drinking water sources over the long term.

At the national and local levels, policies and community practices determine how these frameworks translate into actual access for households. India's Jal Jeevan Mission illustrates how a strong national policy, backed by financing, decentralization, and community participation, can significantly expand piped drinking water coverage in rural areas while emphasizing source sustainability. South Africa's Free Basic Water Policy similarly demonstrates the impact of rights-based national commitments, though its effectiveness varies with local governance capacity. Complementing national efforts, local practices such as community-led groundwater recharge and traditional water harvesting in arid regions of Rajasthan show how locally adapted solutions can directly enhance drinking water availability. Together, these case studies underline that sustainable and equitable access to drinking water depends on coherent multi-level governance, where regional cooperation, national policy design, and locally grounded management practices reinforce one another.

Challenges in River Basin Governance in India

The world's freshwater systems rely on river basins, which provide sustenance to considerable amount of the worldwide population. However, dealing with them may be rather difficult, particularly in cross-border situations when environmental, geopolitical, and legal considerations all come together.

There are a lot of challenges when it comes to river basin administration in India, and there have always been a lot of obstacles to fair management and use of this important resource. The increasing demands on India's water resources are a direct result of the country's rapidly expanding population and booming economy, highlighting the critical need of strong, decentralized strategies for managing river basins.¹⁵ (Government of India & Ministry of Water Resources)

The increasing ecological and hydrological demands on India's main river systems are one of the main obstacles to river basin administration in the nation.¹⁶ (Sinha et al., 2012) Many river basins have seen more frequent and severe droughts and floods as a result of the increasing unpredictability in precipitation patterns induced by climate change.¹⁷ (Swarnkar et al., 2021) In addition to lowering agricultural output and water availability, these severe occurrences heighten tensions among competing water users, such as irrigation, industry, and household consumption.¹⁸ (Best & Darby, 2020) Large dams and reservoirs have been built to improve water storage and flood control, but they often have unforeseen effects, such changing riverine habitats and interrupting natural flow patterns.

The intricate administrative and legal structures that regulate the management of water resources further complicate the administration of river basins in India.¹⁹ (Gupta & Biswas) States are responsible for their own water supply, since water is considered primarily a "state subject" in India. As a result, states have different ideas about how to divide up and utilize the water in river basins, which may lead to disagreements and splits in the process of river basin administration. In addition, there is no overarching national water policy, and different government organizations' responsibilities sometimes overlap, which makes it difficult to create unified strategies for managing river basins.

15 Government of India & Ministry of Water Resources. *National Water Policy* (2012).

16 Sinha, R., Jain, V., & Tandon, S. K. (2012). River systems and river science in India: major drivers and challenges. In *Society of Earth Scientists series*, 67–90). https://doi.org/10.1007/978-3-642-28845-6_6.

17 Swarnkar, S., Mujumdar, P., & Sinha, R. (2021). Modified hydrologic regime of upper Ganga basin induced by natural and anthropogenic stressors. *Scientific Reports*, 11(1). <https://doi.org/10.1038/s41598-021-98827-7>.

18 Best, J., & Darby, S. E. (2020). The pace of Human-Induced change in large rivers: stresses, resilience, and vulnerability to extreme events. *One Earth*, 2(6), 510–514. <https://doi.org/10.1016/j.oneear.2020.05.021>.

19 Gupta, M., & Biswas, R. *Structuring of water policies in India: an overview and way forward*. <https://www.iipa.org.in/cms/public/uploads/469411652172171.pdf>.

The federal system of India has a distinct impact on river basin governance, which in turn mirrors the larger global concerns. Disjointed methods to water management are a consequence of the Indian Constitution's classification of water as a state issue. Water sharing disputes, like the ones involving the Krishna and Cauvery rivers, show how difficult it is for governments with conflicting interests to reach a settlement.

India's approach to water management has revolved on large-scale infrastructure projects like reservoirs and dams. Although the primary goal of these projects is to improve water storage and flood management, there are sometimes unforeseen repercussions such as environmental damage and the relocation of local populations. The Narmada dam is an example of how development goals must be balanced with environmental and social concerns.

In India, managing transboundary water resources is another major obstacle to river basin administration. India shares river basins with many of its bordering nations, including Bangladesh, Pakistan, and China. These countries include the Ganges, Indus, and Brahmaputra. Constant political and economic pressures, together with the effects of climate change, have made it more difficult than ever to reach an agreement on how to fairly divide and administer these transboundary water resources.²⁰ (UN-Water, 2008) Rising geopolitical tensions and climate change are putting the Indus Water Treaty (1960), a landmark treaty of effective bilateral cooperation, to the test. Though they provide venues for discussion, regional cooperation frameworks like SAARC have failed to produce concrete results.²¹ (Kumar, R., 2009) To guarantee long-term management of shared water resources, it is essential to fortify these systems.

There are major gender and social ramifications to the management of river basins in India. Persistent inequities and additional marginalization have been exacerbated by the disproportionate effect of water shortages and water-related catastrophes on neglected populations, especially in rural regions. At the community and household levels, women are crucial in managing and using water resources; however, decision-making processes related to water resource management have frequently been dominated by male-centric viewpoints, with little regard for women's unique needs and experiences.

Finally, there is a wide range of socioeconomic inequalities, transboundary water disputes, institutional and legal complexity, ecological and hydrological stressors, and other problems that hamper the administration of river basins in India. Sustainable and equitable management of India's critical water resources is essential, but overcoming these issues will need a comprehensive strategy that incorporates scientific research, legislative changes, and inclusive stakeholder involvement.

Prioritizing equal access to water while protecting ecological integrity is essential when it comes to adopting a rights-based approach to river basin administration. As part of this strategy, we must address the gendered aspects of water access and work to empower vulnerable populations.²² (Gambe T. R., 2018). It is essential that women be included in decision-making processes because of the crucial role they play in household water management.

By improving resource management with data-driven insights, technological advancements like predictive analytics and real-time water monitoring may improve governance. Optimizing adaptive management systems may be achieved by combining conventional ecological wisdom with cutting-edge scientific research.

20 UN-Water. (2008). *Transboundary waters: Sharing benefits, sharing responsibilities*. <https://www.unwater.org/publications/transboundary-waters-sharing-benefits-sharing-responsibilities>

21 Kumar, R. (2009). SAARC: Changing realities, opportunities and challenges. In German Institute of Development and Sustainability (IDOS) & Deutsches Institut für Entwicklungspolitik (DIE), *Discussion Paper* (Issue No. 11/2009). <https://www.econstor.eu/bitstream/10419/199321/1/die-dp-2009-11.pdf> (2009)

22 Gambe, T. R. (2018). The Gender Dimensions of Water Poverty: Exploring water shortages in Chitungwiza. *Journal of Poverty*, 23(2), 105–122. <https://doi.org/10.1080/10875549.2018.1517399>.

Conclusion

Human dignity, life, and progress in the long run depend on people having access to safe drinking water. International declarations and national frameworks acknowledge it as a human right, yet disadvantaged communities, especially in developing countries, face considerable hurdles in realizing it. Inadequate infrastructure, social and economic obstacles, and ineffective governance all contribute to widening income gaps, which hit women and disadvantaged populations especially hard. Water and environment rights must go hand-in-hand. Environmental degradation of river basins is not merely an ecological problem; it is a profound violation of human rights. In India, mismanaged basins have led to pollution, ecosystem loss and soil erosion, which in turn exacerbate social inequities. Climate change is intensifying these impacts, demanding that legal and policy frameworks evolve. Upholding access to clean water therefore requires a paradigm shift in governance: one that places ecological sustainability and climate resilience on equal footing with human welfare. Managing river basins, particularly those that span international borders, is not a simple task. The effectiveness of resource management is often compromised by competing needs, climate change-induced variability, and geopolitical conflicts. Disputes over the Cauvery and Krishna rivers illustrate how India's fragmented state-centric administration and legal issues further complicate water distribution. The ecological stresses and regional political dynamics further complicate matters for shared water systems such as the Indus and the Brahmaputra. Equity, inclusion, and sustainability should be prioritized in water governance, according to this report, which calls for a rights-based approach. Most importantly, we must work to empower underrepresented groups, implement policies that are attentive to gender dynamics, and make the most of technology developments. The case studies further highlight that fair access to drinking water is contingent on effective multi-level governance, in which regional collaboration, well-crafted national policies, and context-specific local management practices work in synergy to support one another. To overcome these obstacles, we need unified legal systems, global cooperation, and decentralized structures of government. A dramatic change in focus from advancing geopolitical and commercial interests to protecting human rights and preserving the environment is necessary to guarantee everyone has access to safe drinking water. The increasing water issue can be addressed if the international community works together across borders and industries and combines traditional and new knowledge systems. Collective action is required to preserve this critical resource for current and future generations in the battle for clean water, which is more than just a governance problem; it is a moral obligation.

REFERENCES

- BAKKER, K. (2012). Commons versus commodities: Debating the human right to water. In A. Loftus and F. Sultana (eds.) *The Right to Water. Politics, Governance and Social Struggles*. Oxford: Earthscan, 19-44.
- BISWAS A K (2000) Water for urban areas of the developing world in the twenty-first century in Uitto J I and Biswas A K eds *Water for urban areas: challenges and perspectives* **United Nations University Press**, Tokyo 1-23
- BISWAS, A. K. (2001). Water Policies in the Developing World. **International Journal of Water Resources Development**, 489-499.
- CRONIN, A. A., Prakash, A., Sridhar, P., and Coates, S. (2016). Drinking Water Supply in India: Context and Prospects. In A. N. V. Narain, **Indian Water Policy at the Crossroads: Resources, Technology and Reforms** (pp. 49-72). Switzerland: Springer International Publishing.
- CULLET, Philippe. 2013. "Right to Water in India." **The International Journal of Human Rights** 17 (1): 56-78. London: Routledge

- CULLET, P. and J. Gupta. (2009). **India: evolution of water law and policy**. In the Evolution of the Law and Politics of Water (pp. 157-173). Springer: Dordrecht.
- DE ALBUQUERQUE, C. with Roaf, V. (2012). On the right track: Good practices in realizing the rights to Water and Sanitation. **United Nations Special Rapporteur for Water and Sanitation**: Lisbon. https://www.ohchr.org/Documents/Issues/Water/BookonGoodPractices_en.pdf
- GADGIL, Madhav, and Ramachandra Guha. 1995. Ecology and Equity: The Use and Abuse of Nature in Contemporary India. **Gurgaon**: Penguin Random House India
- HADDELAND, I. et al. Global water resources affected by human interventions and climate change. **Proc. Natl. Acad. Sci. USA** 111(9), 3251–3256 (2014).
- HALLER, L.; Hutton, G.; Bartram, J. Estimating the costs and health benefits of water and sanitation improvements at global level. **J. Water Health** 2007, 5, 467.
- HARVEY, P.A. Environmental sanitation crisis: More than just a health issue. **Environ. Health Insights** 2008, 2, 77
- HUTTON, G.; Haller, L.; Bartram, J. Global cost-benefit analysis of water supply and sanitation interventions. **J. Water Health** 2007, 5, 481–502.
- JAIN, C. K. & Singh, S. Impact of climate change on the hydrological dynamics of River Ganga, India. **J. Water Clim. Change** 11(1), 274–290 (2020).
- KANDPAL, P. C. (2019). **Environmental governance in India**: Issues and Challenges. SAGE Publications Pvt. Limited.
- MALL RK, Gupta A, Singh R, Singh RS, Rathore LS (2006) Water resources and climate change: An Indian perspective. **Curr Sci** 90(12):1610–1626
- MAGILLIGAN, F. J., Nislow, K. H. & Graber, B. E. Scale-independent assessment of discharge reduction and riparian disconnectivity following flow regulation by dams. **Geology** 31(7), 569–572 (2003).
- MEIER, B.M, Cronk, R., Luh, J., de Albuquerque, C. & Bartram, J. (2018). Monitoring the progressive realization of the human rights to water and sanitation: Frontier analysis as a basis to enhance human rights accountability. In K. Conca & E. Weinthal (Eds.), **The Oxford handbook of water politics and policy** (pp. 100-119). Oxford: Oxford University Press.
- PANDIT, C; Biswas, A. K. (2019). India's National Water Policy: 'feel good' document, nothing more, **International Journal of Water Resources Development**.
- PARWEEN, F. and Singh, A. (2021). Implementation of National Water Policy by eastern states of India – A review and analysis. **World Water Policy**. Volume 7: 63-73.
- SHAH, T.; Koppen, V B. (2006). **Economic and Political Weekly**, Vol. 41, No. 31, pp. 3413-3421.
- UNITED NATIONS WORLD WATER ASSESSMENT PROGRAMME. (2016). **The United Nations world water development report 2016**: Water and jobs. Paris, France: UNESCO. Retrieved from. <http://unesdoc.unesco.org/images/0024/002439/243938e.pdf>
- UNITED NATIONS GENERAL ASSEMBLY (UN GA). (2018). **Report of the Special Rapporteur on the human rights to safe drinking water and sanitation**, Léo Heller. A/73/162.