The Rhine flowing behind the Basler Münster in Basel, Switzerland.

Restoring India's Rivers: European Experiences and Challenges

While structural differences exist between the European and Indian river basin management systems as in the hydroclimatic conditions and the social-political context, understanding the European model can provide valuable insights to strengthen India's river rejuvenation efforts.

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Introduction

The European experience of river basin management (RBM) is often considered a template for many emerging nations. Europe demonstrated the successful implementation of river restoration programmes for some of its most complex and important trans boundary river basins, such as the Rhine and Danube. Recent developments suggest that India too is inspired by the European river basin management model and aspires for a paradigm shift in its approach to river management—by recalibrating its existing plans, policies, and programmes to be responsive to the integrated needs of its river system.

The flagship Namami Gange Programme (NGP) under the Ministry of Jal Shakti (MoJS) is one such instance. However, few acknowledge the significant divergence that exists between the two regions in terms of

political economy, sectoral orientations, and the historical context of the institutions that are engaged in water management.

We employ some key observations that emerged from research on the relevance and fit of the European experience of river basin management in India to highlight some key policy, institutional, and political processes that were pivotal to the European model, and locate them within India's federal water governance framework. The article argues that an examination of the structural differences in hydroclimatic conditions, socio-political context, institutional attributes, and water policy processes between the two regions will be critical to identifying the key lessons from Europe that could strengthen India's river rejuvenation journey.

Europe's Environmental Awareness

The current state of Europe's water management paradigm is a result of fundamental shifts in the continent's socio-economic fabric. To start with, the saturation of infrastructure building to develop Europe's water resources shifted the trend towards incorporating progressive policy thinking on the environmental and ecological aspects of river management (Thatte 2005; Warner et al. 2008). This transition is also attributed to a distinct moment in history when the perception of key stakeholders and citizens began shifting on matters related to the environment—the global north increasingly began viewing environmental challenges as a threatening "risk" to their society (Allan 2003).

These conditions prompted European society to pressure governments and industries to change their business-as-usual approach in dealing with environmental degradation (Allan 2003). In other words, addressing environmental pollution gained traction as both a socio-economic and political process, and it significantly influenced the outcome of river rejuvenation in the region.

In contrast, India's river rejuvenation journey is still at a relatively nascent stage. International developmental partnerships, notably the India-EU Water Partnership (IEWP), are built on the premise of a possible replication of the European Union's success in building a regional network, institutions, and governance mechanism for the management of its river basins. This is in addition to exchanging knowledge. However, this does not sufficiently acknowledge the great differences in the political economies and institutional histories of the two regions. We highlight a few important findings from our analysis of the European water management paradigm and see how it compares to India.

European Water Management

Europe's environmental or water policymaking is characterised by its integration with the political economy. It follows the approach of "gradual incrementalism", where the environmental and water policies are calibrated periodically along with broader supranational, national, and sub national economic priorities and other sectoral policies (Aubin and Varone 2004). The Single European Act of 1986, besides creating a "single market" for the first time, explicitly recognised the need for "integration of environmental concerns into other European policies" (Single European Act 1986).

> *The extensive consultation process [in the EU] was a result of the influence of lobbying by sectoral actors, ranging from agriculturists to industrial bodies and drinking water suppliers, on the EU's water policymaking.*

Second, the EU Water Framework Directive (WFD)—the umbrella framework guiding the EU's water management that is increasingly seen as an aspirational model in various nations, including India—emerged from a long-drawn process that involved protracted negotiations at multiple levels (Kaika 2004). The extensive consultation process was a result of the influence of lobbying by sectoral actors, ranging from

agriculturists to industrial bodies and drinking water suppliers, on the EU's water policymaking. In particular, the consensus on the Directive could only be finalised after politically accommodating the important actors. These dynamic and adaptable processes have proved to be a robust and resilient foundation for managing pollution in European river basins.

The Ganga in Varanasi.

Third, a range of factors, not independent of each other, coalesced to shape the river rejuvenation agenda in Europe. In the case of the Rhine Action Programme, as Mostert (2008) argues, various factors, such as the formation of the EU and its binding directives; growing environmental awareness and the work of environmental non-governmental organisations (NGOs) in the basin states; participation of waterworks in the Rhine basin; and the role of industry in the region contributed to water quality improvement. He goes on to argue that "the Rhine experience reinforces the importance of the economic, social, and political context of river basin management, and due to these contextual factors, the Rhine example cannot simply be emulated for other basins." This reinforces the necessity of unpacking the contributing and contextual factors that are unique to each river basin.

Europe's water resources management paradigm reveals various factors unique to the region. India's water resources reform process is structurally constricted by various political, economic, and social factors (Shah et al. 2005). This explains the divergence in outcomes of river rejuvenation programmes in the two regions.

Different Priorities

The European Commission (EC) in 1988 adopted the Nitrates Directive, a legally binding instrument to control agricultural nitrate pollution (Goodchild 1988). However, its implementation encountered difficulties. In the 1990s, European subsidies for agriculture were significantly reduced, which made it politically challenging for the member nations to put a cap on fertiliser use by farmers because it would

impede agricultural intensification. This resulted in low and varied implementation of the Nitrates Directive (Aubin and Varon 2004).

This prompted the European Commission's Common Agricultural Policy (CAP) to shift from a linear focus on agricultural intensification to introducing environmental objectives in the region's agricultural policy (Heinz 2008). Thus, the European Commission, as a supranational body, has played an important political role in crafting a unified agricultural policy to tackle agricultural non-point source pollution.

> *In Europe and other highly industrialised nations, the agricultural sector is part of a system that is far more formalised than in India.*

In India, agricultural water pollution took a back seat as a policy priority, with environmental regulators having a rather skewed focus on tackling industrial and domestic pollution. This was reflected in India's National Water Policy (NWP) of 2012 and other government flagship programmes. The National Water Policy does not explicitly refer to agricultural water pollution and the Pradhan Mantri Krishi Sinchayee Yojna (PMKSY), launched in 2015, attempts to prioritise water quantity issues and agricultural productivity over quality or pollution-related challenges.

Organisational Structures

The political economy of the agricultural sector fundamentally differs in the two regions, which provides a distinct character to the organisational structures associated with the sector. In Europe and other highly industrialised nations, the agricultural sector is part of a system that is far more formalised than in India (Shah 2015). This is seen in the EU, which has a small number of large commercial farmers who are linked to formal water service providers (Shah 2015). This system is better responsive to various regulations aimed at addressing non-point pollution sources emanating from farming, or policies for improving the sector's environmental sustainability.

On the contrary, in India, there are a large number of smallholder farmers with a high dependence on individual groundwater-based connections. This makes environmental regulation difficult and involves high transaction costs for the government (Shah et al. 2005; Shah 2015). The issue has been acknowledged in the report on the Ganga River Basin Management Plan (GRBMP) prepared by a consortium of seven Indian Institutes of Technology (IITs) in 2015. It highlights how reforms on agricultural water management in the Ganges Basin hinge on addressing the large number of small and fragmented landholdings in it (IITs 2011).

The livelihood dependence on agriculture, coupled with the economic and social transformation steered by private groundwater-based connections, has produced a distinct political economy in agriculture in India (Shah et al. 2012). So, policy responses and research have concentrated on the interlinked issues of equity in access and distribution of water, food security, rural incomes, and power subsidy. Agriculture or non-point pollution sources in general as contributors to river basin pollution have taken a backseat and barely capture the political imagination.

Coordination and Cooperation

Europe's water management displays a robust and dynamic institutional architecture. The practice of institutional continuity in Europe has proven to be particularly useful in building a robust foundation for its water institutions. Many of the institutional and policy innovations emerging out of Europe across levels of government are a result of reinventing and recalibrating the existing institutional structure for enhanced laws, rules, and norms that have improved pollution management over the years.

The European experience suggests that although infrastructural development takes up the lion's share of resources, other aspects, such as policy and institutions, matter.

These institutions have emerged as sites for continuous engagement and capacity building. For instance, the International Commission for the Protection of the Rhine (ICPR), constituted in 1950, took decades of technical and political engagement to produce tangible outcomes. In addition, EU nations took the difficult path of harmonising and transposing national, sub national, and local water policies and legislations to suit the regional context—the Water Framework Directive being a prominent example (Moss 2012; Hueesker and Moss 2015).

To accomplish that, European leaders worked with their domestic constituencies and political allies to implement varied measures for river rejuvenation under these frameworks—such as establishing standardised monitoring and analysis of water quality; protocols for inter- and intra-state mechanisms for implementation of the Water Framework Directive; and cost-sharing mechanisms for various infrastructural projects.

The European experience suggests that although infrastructural development takes up the lion's share of resources, other aspects, such as policy and institutions, matter. At the regional scale, implementation of the Water Framework Directive was made possible through the Common Implementation Strategy (CIS), a mechanism that focused on the methodological and technical aspects of implementing the framework coherently (European Commission 2003). In doing so, significant political and diplomatic capital was invested to build consensus across scales and sectors.

In contrast, India's federal arrangement of centre-state and inter-state cooperation and coordination towards improving water quality or environmental management are considered inadequate (Chokkakula 2019; Chokkakula et al. 2021). The country's current river basin management legislation and policy are vastly different from the EU Water Framework Directive. The former is geared towards managing and regulating inter-state rivers, while the latter is a legally binding framework for water quality management at multiple levels, which requires integrating regional directives into national laws. India's Constitution has water on the state list (sub national territorial units), but the states have been unable to produce a unified vision for the country's water management.

In India, many of the specific institutions or initiatives that have emerged out of specific needs have been slow to keep up with the demands of the dynamic nature of environmental problems.

This is evident in the disuse of the River Boards Act, 1956 and the River Basin Management Bill, 2018. The latter is yet to be placed in Parliament because the central government is yet to get the views of states on its contents. India's river rejuvenation journey would benefit from adopting suitable federal arrangements to politically accommodate the concerns of states. In the end, it is the states that need to adapt river restoration programmes into their plans, policies, and finances.

In India, many of the specific institutions or initiatives that have emerged out of specific needs have been slow to keep up with the demands of the dynamic nature of environmental problems. This explains why pollution abatement in river basins in India has predominantly been a judiciary-driven approach. Here, the court's directions on matters related to environmental pollution provide temporary solutions rather than making institutions adapt to emerging challenges. Rajamani (2007), in this context, remarks that in India the "judiciary fills in wherever there is a perceived vacuum in governance."

The Basin Context

The historical evolution of the institutional architecture and politics driving the governance of water resources has been guided by hydroclimatic conditions. The evolution of mechanisms for consensus-building approaches specific to water issues is very different across the two regions. Europe, in the post-World War II period, took a proactive stand to build consensus on matters related to water quality rather than quantity. As Shah et al. (2005) point out, many developing nations are in climatically challenging geographic areas. The favourable climatological, hydrological, and socio-economic factors in Europe, barring a few outliers, ensured that the quantity of water was less of an issue than its quality.

India's water resources endowments display significant inter-regional variability and inter-basin disparity, manifesting in inequitable distribution. In addition, there are historical asymmetries in the development and allocation of water resources, even among the states (D'Souza 2006; Chokkakula 2017). For instance, large peninsular basins such as the Cauvery and Krishna, with low water resources potential, have been developed significantly with limited scope for new development. But basins such as the Brahmaputra and Barak, with high water resources potential, are underdeveloped (NCIWRD 1999).

This inter-state disparity also manifests in concurrent "scarcity" and "surplus" water conditions. Unlike Europe, hydroclimatic conditions, a large population base, deficit infrastructure, and historical inequities in development have tilted the discourse on water management in India towards resolving inter-state water disputes (Chokkakula 2019).

Looking Ahead

India's river conservation programme has come a long way from an infrastructure-focused river conservation plan to a holistic effort in river restoration through the Namami Gange Programme. Recent developments have seen a promising effort to expand the scope of river management in the wider context of the circular economy through wastewater reuse and river-centric urban planning. One of the key institutions that have provided a template for India's river rejuvenation journey is the National Mission for Clean Ganga (NMCG), the executive arm of the Namami Gange Programme, which has been engaged in steering the programme.

> *These developments suggest the importance of river rejuvenation as a policy priority in India, and, at the same time, pursuing innovative and mutually beneficial partnerships with EU nations to tackle problems from climate change to water management.*

The NMCG's work has been instrumental in expanding the scope and scale of restoring the Ganges basin. However, as a river basin authority that has been institutionally designated as an implementer and a regulator, a great deal of work remains to be done by it. To an extent, its scope is limited as an implementer of the Namami Gange Programme, which only has a mission life till 31 March 2026. But long-term planning for the programme would require revisiting some of the core objectives it has already achieved, reviewing current bottlenecks, and outlining future directions in the face of emerging risks such as climate change. These are important to produce enduring outcomes after the mission ends.

Concomitantly, India is contemplating expanding the Namami Gange Programme's experiences into a policy ecosystem. The Ministry of Jal Shakti recently commissioned a large-scale study on assessment and management plans for six river basins in the country along the lines of the Namami Gange Programme.

India and the EU are key partners in exchanging knowledge on water management. The exchange of knowledge has been formalised through the India-EU Water Partnership, which has established a space for

political dialogue between the two regions on matters related to water.

These developments suggest the importance of river rejuvenation as a policy priority in India, and, at the same time, pursuing innovative and mutually beneficial partnerships with EU nations to tackle wide-ranging problems from climate change to water management. However, political dialogues between the two regions on water management also require sensitivity to the structural differences between them. This is critical to moving away from simple "policy transfer" solutions to producing plans of action that are relevant to India's federal polity and its river basin conditions.

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References

Allan, J. (2003): "IWRM/IWRAM: A New Sanctioned Discourse?" Occasional Paper 50, SOAS Water Issues Study Group, University of London. https://lwrg.wordpress.com/wp-content/uploads/2014/12/iwram-a-new-sanctioned-discourse.pdf

Aubin, D. and Varone, F. (2004): "The Evolution of European Water Policy", In Stefan Kuks and Ingrid Kissling-Näf (eds), *Evolution of National Water Regimes in Europe: Transitions in Water Rights and Water Policies* (pp. 49–86), Springer Netherlands.

Chokkakula, S. (2017): "Why do Interstate Water Disputes Emerge and Recur? An Anatomy of Ambiguities, Antagonisms and Asymmetries", Monograph No.45, Centre for Economic and Social Studies, Hyderabad.

Chokkakula, S. (2019): "Interstate River Water Governance: Shifting the Focus from Conflict Resolution to Enabling Cooperation", In *Policy Challenges 2019-2024* (pp. 118–121), Centre for Policy Research, New Delhi.

Chokkakula, S., Kapur, A. and Singh, A. (2021): "Water and Federalism: Working with States for Water Security", TREADS Working Paper, Centre for Policy Research, New Delhi. https://accountabilityindia.in/wp-content/uploads/2021/12/WP_Water-Federalism_Final.pdf

D'Souza, R. (2006): *Interstate Disputes over Krishna Waters: Law, Science and Imperialism*. Hyderabad: Orient Blackswan.

Goodchild, R.G. (1998): "EU Policies for the Reduction of Nitrogen in Water: The Example of the Nitrates Directive", Environmental Pollution, 102 (1, Supplement 1), pp. 737–40. https://doi.org/10.1016/S0269-7491(98)80106-1

Government of India (1999): "The National Commission for Integrated Water Resources Development (NCIWRD).

Heinz, I. (2008): "Co-operative Agreements and the EU Water Framework Directive in Conjunction with the Common Agricultural Policy", Hydrology and Earth System Sciences, 12 (3), pp. 715–26. https://doi.org/10.5194/hess-12-715-2008

Hueesker, F. and Moss, T. (2015): "The Politics of Multi-scalar Action in River Basin Management: Implementing the EU Water Framework Directive (WFD)", Land Use Policy, 42, pp. 38–47. https://doi.org/10.1016/j.landusepol.2014.07.003

Indian Institutes of Technology (2011): *Trends in Agriculture and Agricultural Practices in Ganga Basin*. New Delhi: National Mission for Clean Ganga.

Kaika, Maria (2020): "Water for Europe: The Creation of the European Water Framework Directive", in Julie Trottier, and Paul Slack (eds), *Managing Water Resources, Past and Present* (Oxford, 2004; online edn, Oxford Academic, 12 Nov. 2020). https://doi.org/10.1093/oso/9780199267644.003.0012

Moss, T. (2012): "Spatial Fit, from Panacea to Practice: Implementing the EU Water Framework Directive", Ecology and Society, 17. https://doi.org/10.5751/es-04821-170302

Mostert, E. (2008): "International Co-operation on Rhine Water Quality 1945–2008: An Example to Follow?" Physics and Chemistry of the Earth, Parts A/B/C, 34, pp. 142–49. https://doi.org/10.1016/j.pce.2008.06.007

Rajamani, L. (2007): "Public Interest Environmental Litigation In India: Exploring Issues Of Access, Participation, Equity, Effectiveness And Sustainability", Journal of Environmental Law, 19 (3), pp. 293–321.

Resolution on Single European Act (1986).

Shah, T. (2015): "Water Governance: Context is Crucial", Global Sustainable Development Report (GSDR). https://sustainabledevelopment.un.org/content/documents/630978-Shah-Water%20governance-context%20is%20crucial.pdf

Shah, T., Giordano, M. and Mukherji, A. (2012): "Political Economy of the Energy-Groundwater Nexus in India: Exploring Issues and Assessing Policy Options", Hydrogeology Journal, 20. https://doi.org/10.1007/s10040-011-0816-0

Shah, T., Makin, I. and Sakthivadivel, R. (2005): "Limits to Leapfrogging: Issues in Transposing Successful River Basin Management Institutions in the Developing World", in M. Svendsen (ed.), *Irrigation and River Basin Management: Options for Governance and Institutions*, pp. 31–49). https://doi.org/10.1079/9780851996721.0031

Thatte, C.D. (2005): "Sabarmati River Basin (India): Problems and Prospects for Integrated 67 Water Resources Management", in *Integrated Water Resources Management in South and South- East Asia* (pp. 67–104), Oxford University Press.

Warner, J., Wester, P. and Bolding, A. (2008): "Going with the Flow: River Basins as the Natural Units for Water Management?" Water Policy, 10, pp. 121–38. https://doi.org/10.2166/wp.2008.210

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