

SHIFTING SCALES FROM INTERNATIONAL TO SUBNATIONAL

A Comparative Analysis of India and
Germany's Federal Water Governance

DEBARSHEE DASGUPTA



SHIFTING SCALES FROM INTERNATIONAL TO SUBNATIONAL

A Comparative Analysis of India and
Germany's Federal Water Governance

DEBARSHEE DASGUPTA



© 2025 Hanns Seidel Foundation India

5, Siri Fort Road, New Delhi-110049

Email: delhi@hss.de; Website: <https://india.hss.de/>

All rights reserved

Cover Images:

(1) The Rhine river in Basel, Switzerland (© Subia Ahmad)

(2) The Ganges river in Varanasi, India (© Debarshee Dasgupta)

Disclaimer: The views expressed here are those of the author(s) and do not reflect necessarily reflect the views of Hanns Seidel Foundation.

FOREWORD

The global urban population facing water scarcity is projected to increase from 930 million in 2016 up to 2.4 billion people by 2050 (nearly half of the global urban population), according to the 2023 UN World Water Development Report on Partnerships and Cooperation. India is expected to be among the most severely affected countries. With a population of over 1.4 billion, India is home to nearly 18 percent of the world's population but has access to only about 4 percent of the world's water resources. The country is already facing an acute water crisis, exacerbated by multifaceted challenges such as climate change, rapid urbanization, and groundwater depletion.

Successfully addressing these challenges by implementing a comprehensive water management framework is central to realising India's vision of Viksit Bharat (Developed India) by 2047. The latter requires a holistic and collaborative roadmap where effective water governance plays a crucial role for driving economic growth, as it ensures food and energy security and advances sustainable development goals, among other factors like resilient climate strategies and infrastructure investment. In the backdrop of India's strategic partnership with the European Union (EU), the 'India-EU Water Partnership' was jointly formed in 2016, focusing on technological collaboration, policy exchange, and sustainable investment in water management. During the recent visit of the President of the European Commission and EU Commissioners to India, both sides reaffirmed their commitment to deepen cooperation in key areas, including river basin management, wastewater treatment, urban flooding, and water governance — key pillars in strengthening India's water security. Building on this foundation, India and Germany have reinforced their collaboration under the Indo-German Green and Sustainable Development Partnership (GSDP), particularly in the fields of climate action including water management. Germany's extensive experience in River Basin Management (RBM), guided by the EU

Water Framework Directive (WFD), provides valuable insights into managing transboundary water resources and implementing decentralized governance models, offering lessons for India's federal approach to water governance.

Committed to strengthen the dialogue among Indian and European stakeholders in areas of mutual interest to advance sustainable development, Hanns Seidel Stiftung India (HSS) has been supporting projects in the realm of sustainable water governance through policy dialogues and capacity-building programmes for almost three decades. For instance: in view of the state partnership between Karnataka and Bavaria, HSS has been strengthening the cooperation at the nexus of climate action, federalism and water management. With the objective of advancing sustainable development efforts and fostering climate resilience at subnational level, one current key focus is the support towards the effective implementation of the Karnataka State Action Plan on Climate Change through means of e-governance and monitoring strategies in the sectors of water and agriculture.

This paper was developed by a Fellow of the Young South Asia Network (YSAN) programme, launched in 2022 by HSS to support the future leaders of tomorrow from multidisciplinary fields across South Asia. The programme promoted the exchange of best practices in areas of common challenges such as urban sustainability, climate change, and urban governance while also fostering meaningful connections through multilateral dialogues with subject-matter experts and like-minded peers. We express our sincere appreciation to Debarshee Dasgupta, our YSAN fellow, for his timely and insightful work. This working paper serves as a useful reference for academicians, research scholars, policymakers and practitioners in both India and Germany, fostering knowledge exchange and policy dialogue on river basin management at the national and subnational levels.



Judith Weinberger-Singh,

Resident Representative, Hanns Seidel Foundation India

EDITOR'S NOTE

The recently published Focus on India report by the German cabinet in the 25th year of its partnership with India celebrates the importance of the strategic cooperation between India and Germany and provides a framework on the conduits of advancing bilateral cooperation between the two nations. Although security concerns dominate this diplomatic engagement, the report provides a foundation for reimagining Indo-German, and by extension, India-EU collaborations across sectors of global importance — climate change, water management, and tackling environmental pollution. These remain important priorities for India, as it strives towards becoming a developed nation by 2047.

River Basin Management (RBM) and transboundary cooperation has emerged as a critical area of engagement in this broader partnership between India and Germany. Drawing on Germany's and the wider European Union's vast experience in this arena has been a significant part of the strengthening ties between the two countries. This is evident in the already existing India-EU Water Partnership (IEWP), in which Germany plays a central and critical role, and the Green and Sustainable Development Partnership (GSDP), wherein Germany and India have created a platform to jointly address global issues impacting the future, such as tackling the Sustainable Development Goals (SDGs) of the 2030 Agenda, preserving, and harnessing their natural resources and biodiversity.

Characteristically, India and Germany are both federal nations with their own unique historical pathways in which their respective politics, law, and institutions emerged to pursue RBM. The federal experience of both the countries underscores their differing hydroclimatic conditions and domestic contexts which played a defining role in charting the course for pursuing RBM. The interplay of federalism and water management provides a canvas to delve into the nuances of the Indian and German RBM framework and lessons that can be drawn from the German experience and possible entry points for strengthening the Indo-German water cooperation. RBM, in the federal context, brings forward the vitality of pursuing subnational engagement

between the two nations — to supplement and reinforce country-to-country engagement in this sector. This commitment has been reinforced with the adoption of the aforementioned Focus On India report by the German cabinet in 2024.

Building on and synergising both national and subnational strategic partnerships has the potential to deepen Indo-German cooperation, particularly in the arena of water and environmental management. Through this paper, we invite you to explore this comparative study on the RBM trajectory of both nations and the contours of subnational engagement in the future as we build upon this research.

Subia Ahmad,

Senior Research Associate, Centre for Policy Research

ABOUT THE AUTHOR

Debarshee Dasgupta is a Senior Research Associate with the Transboundary Rivers, Ecologies, and Development Studies (TREADS) initiative at the Centre for Policy Research (CPR) in New Delhi, India. In this role, he researches various aspects of federal and inter-state governance of transboundary rivers in South Asia and Europe. He is broadly interested in the institutional aspects of water governance, river basin management, and environmental planning. He holds a Master's degree in Environmental Planning from CEPT University, Ahmedabad. He is part of the Young South Asia Network supported by the Hanns Seidel Foundation (HSF) India. To broaden his understanding of the various aspects of federalism across the globe, he also attended the Winter School on 'Federalism and Sustainability' jointly organised by the University of Innsbruck, Austria and the Eurac Research Centre, Italy.

ACKNOWLEDGEMENTS

This paper was developed as part of the Youth South Asia Network (YSAN) programme, supported by Hanns Seidel Foundation India. The author extends sincere gratitude to Subia Ahmad, Judith Weinberger-Singh, and Deepak Dhawan for their unwavering support and invaluable contributions for bringing this paper to fruition.

TABLE OF CONTENTS

INTRODUCTION	1
APPROACH	4
RIVER BASIN CHARACTERISTICS AND DIFFERENTIATED RISKS	5
THE LEGAL CONTOURS OF FEDERALISM: DIFFERENTIATED PULL AND PUSH	9
INSTITUTIONS FOR COORDINATION AND COOPERATION	15
CONCLUSION AND DISCUSSION	20
WAY AHEAD: STATES AS ‘ENABLER’ OF INTERNATIONAL COOPERATION	22
BIBLIOGRAPHY	23

INTRODUCTION

THE CONTOURS OF EU WATER & DIPLOMACY

In 2016, the European Union (EU) entered into a strategic partnership with India — the India-EU Water Partnership (IEWP) to drive collaboration between India and the EU on sustainable water management. This formal partnership between the two is one of many instances that reflects the increasing role of the EU in global water diplomacy (Aamer 2021). One of the core premises on which such engagement is founded is the EU's successful demonstration of building a regional network, institutions, and governance mechanism for the management of its transboundary river basin. For instance, the EU's experience in implementing the EU Water Framework Directive¹ (EU WFD), based on the principle of Integrated River Basin Management (IRBM), is often considered, and rightly so, as an exemplary case of river basin management and transboundary water cooperation.

RECALIBRATING INDIA-EU WATER PARTNERSHIP

India and EU share a long-standing formal partnership and a strategic vision to advance multilateral engagement on environmental protection, climate change, and sustainable development. Since 2000, the EU and India have deployed significant diplomatic and financial capital to advance these objectives, especially in matters related to climate impacts and water management. To further bolster the water related cooperation between the two regions, India-EU Strategic Partnership 2020 called for establishing a Joint Working Group on Water and the EU-India Water Forum to support and facilitate the IEWP. However, significant challenges exist.

The discourse on transboundary water cooperation has often been dominated by international relations theories that pay scant attention to the national and subnational political dynamics. This consideration of transboundary water from the distant view of international politics often obscures the contribution of domestic political agencies to international water cooperation and agreements. It must be recognised that the EU is not a monolithic block. The member states of the EU display a widely different political and social configuration and domestic political realities — all of which have an impact on the water governance process and pathways.

¹ The key objectives of the WFD are set out in Article 4 of the Directive. It requires Member States to use their River Basin Management Plans (RBMPs) and Programmes of Measures (PoMs) to protect and, where necessary, restore water bodies in order to reach good status, and to prevent deterioration. Good status means both good chemical and good ecological status (European Commission).

As has been argued by a former Executive Secretary of the International Commission for the Protection of the Rhine (ICPR) — “rules and principles that are negotiated at the international level have ‘general content’ and the riparian countries need to translate those into more specific rules for their precise implications” (Goppel 1991). In fact, reworking of the domestic legislation and political manoeuvring by the member nations was a crucial ‘enabling factor’ in steering the success of the Rhine River restoration programme (Mostert 2009).

In this regard, the IEWP has certain limitations. First, the Partnership has predominantly focused on the international dimension wherein ‘water’ is a component of a larger strategic partnership between EU and India. Second, it is predominantly skewed towards ‘technical cooperation’ in implementing the EU's good practices, infrastructural development, and technology transfer, and limited critical engagement on the policy and institutional processes. This translates to a constrained understanding of the extent to which such knowledge transfer could be useful in the context of India’s distinct political economy. This background provides a fertile ground to reinforce a shift in the focus from international dimension to a national context to bring the particular role and path dependency of a member state into sharp focus.

REVISITING THE SCALE OF GOVERNANCE: WATER AND FEDERALISM

IRBM is one fundamental tenet of the European Water Management paradigm. The practice of IRBM hinges on the fact that ‘river basin’ is the logical unit of governance — requiring multi-level cooperative structures and institutional mechanisms, generally termed as the River Basin Organizations (RBOs) (Molle 2009). The praxis, however, is far from simple. This particularly takes a complex form in the federal system of government — resembling “both divided sovereignty, as between nations, and united sovereignty as in unitary regimes” owing to its fundamental distribution of powers between the national and the subnational political and administrative units based on their respective constitutional framework (Garrick et al. 2014). Under this condition, the practice of RBM manifests in a situation akin to ‘effectiveness vs. legitimacy dilemma’ (Benz 2007), where the challenges for the policy makers in federations lies in navigating the autonomous character of the subnational political-administrative units with the need for holistic and integrated needs of the rivers and its ecology. ‘Basin’ as a logical unit of governance comes in contestation with the social, political, and economic imperatives of the political units (Garrick et al. 2014). This dissonance has been pronounced in the South Asian region, where the practice of integrated water resources management (IWRM) has been constricted by various structural

issues (Mollinga 2006, Shah et al. 2006). Take, for example, India, where the management of the transboundary river basins (both interstate and international) has been influenced by the multilevel federal dynamics, as is documented in the Teesta river conflict with Bangladesh (Wirsing 2007), and domestically, the Cauvery river water dispute (Moore 2018, Chokkakula 2017).

CONTEXTUAL LEARNING: HOW INDO-GERMAN COOPERATION WOULD HELP?

In revisiting the scale of cooperation and recalibrating the India-EU water and climate partnership, it becomes imperative to bring forward the experience of some of the EU member states vis-à-vis India into sharp focus, while also acknowledging the structural differences between the two regions — since contextual factors remain an important requisite for meaningful knowledge exchanges and critical policy diffusion.

In his book on four centuries of water management in Germany, Blackbourn (2007) describes the importance of critical analysis in ‘extrapolating findings’ and policy transfer from developed to emerging nations and caution against the general assumptions that what is ‘right’ for a rich country that has built extensive infrastructure today is ‘right’ for a developing nation that has been unable to make such investments (Briscoe 2014). This particularly finds relevance in climate change debate and development of water resources infrastructure, especially storage structure or dams. On a comparable note, Pahl Wostl (2019) also suggests against resorting to recommendations for water governance reform based on ‘simplistic panaceas’ without testing appropriateness in diverse contexts’ and supporting the need for a ‘comparative perspective’ to pursue a ‘generic yet a contextual approach’. In this regard, Indo-German comparative study becomes a useful vehicle to distill useful learning at the intersection of river basin management and federalism. This could also possibly help delineate the potential and the limitations of pursuing the ‘European model’ of RBM.

APPROACH

The intersection of the federal political system and river basin management are subjected to three interrelated challenges: First, the multi-scalar nature of environmental problems and, concomitantly, how to design the division of administrative powers governing water in a multi-scalar setting. Second, how to ensure cooperation among the many constituent units towards collective action on environmental and climate governance. Third, the role of institutional mechanisms for conflict resolution. These challenges however take differentiated shape and vary across federations, and diverse geographic and hydro-climatic settings (Garrick et al. 2014). These variations are in turn shaped by the differing regional contexts, political structure, and hydro-climatic conditions that combine together to shape the governance choices and management responses. The comparative analysis of federal and provincial water governance precisely aims to bring these nuances to the fore for informing policy-making for India's own river basin management. The approach adopted for the analysis draws from various secondary literature sources — ranging from government documents and peer reviewed journals. For the purpose of this paper, three broad parameters have been chosen that highlight some key policy, institutional, and political processes that were pivotal to the German model, and locate them within India's federal water governance framework. The three parameters identified are:

- River Basin Characteristics
- Legal Framework
- Policy and Institutional Mechanisms

RIVER BASIN CHARACTERISTICS AND DIFFERENTIATED RISKS

The hydro-climatic conditions and contexts of the river basins determine the management pathways of river basin management to a significant extent. Grey and Sadoff (2007) point out that natural hydrology — in terms of absolute water availability, temporal variability, and spatial distribution — is a critical factor for the achievement of water security for ecosystems and human beings. The basin context plays a role not only in the physical nature of ‘water scarcity’ but the way the politics around it are manifested and are shaped in the federal context. This has long term implications on the respective water policy and the management pathways. How did the basin characterise Germany and India’s water policy making?

GERMANY: THE SHIFT FROM ENGINEERING APPROACH TOWARDS RISK MANAGEMENT

According to Germany's Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), Germany is a country rich in water resources. The German Environment Agency estimates that annually, the potential water available is 188 billion m³ of freshwater (water yield). It is divided into important river basins that are both transnational and within Germany — the five large river basins are Elbe, upper Danube, Rhine, Weser and Ems and small parts of Oder and Muese and shared among 16 Länders (subnational entities). Köck (2012) employs the European Environment Agency (EEA) standards and assesses that river catchments in Germany are predominantly not water stressed and water allocation and distributional conflicts are mostly localised. The central objective of Germany’s water management, as reflected in the official position of BMUV, is conservation of water bodies and improvement of water quality across the nation.

In terms of water usage, Germany displays an interesting mix: the bulk of the water is consumed by its energy utilities (around 12 per cent), followed by the mining sector, and public water supply. Irrigation in agriculture constitutes only a minor portion of the water usage (Wackerbauer 2009). Water availability in high volume coupled with demand management strategies have further bolstered the overall physical availability of water in Germany's context. The overall high volume of available water resources in Germany means that water quantity management has historically been less of a challenging issue. Although, in recent times, inter-regional conflict pertaining to water quantity has received attention as an emerging risk and is attributed to climate change impacts (Köck 2012, Kosow et al. 2024).

In addition, there are certain structural advantages of river basin characteristics in Western Europe. In Europe, the high economic feasibility of hydropower is manifested in European countries investing significantly in dam building exercise and developing significant hydropower potential - around 70 per cent by some estimates (Grey & Sadoff 2007). These structural conditions of water availability and saturation of the dam building exercise shifted Europe's policy priority in general and Germany's in particular towards managing risks of pollution and flood. This partly explains the absence of 'water use' prioritization among sectors in Germany's water policy. In the German federation, the principal concern for RBM is improvement of water quality and flood risk management.

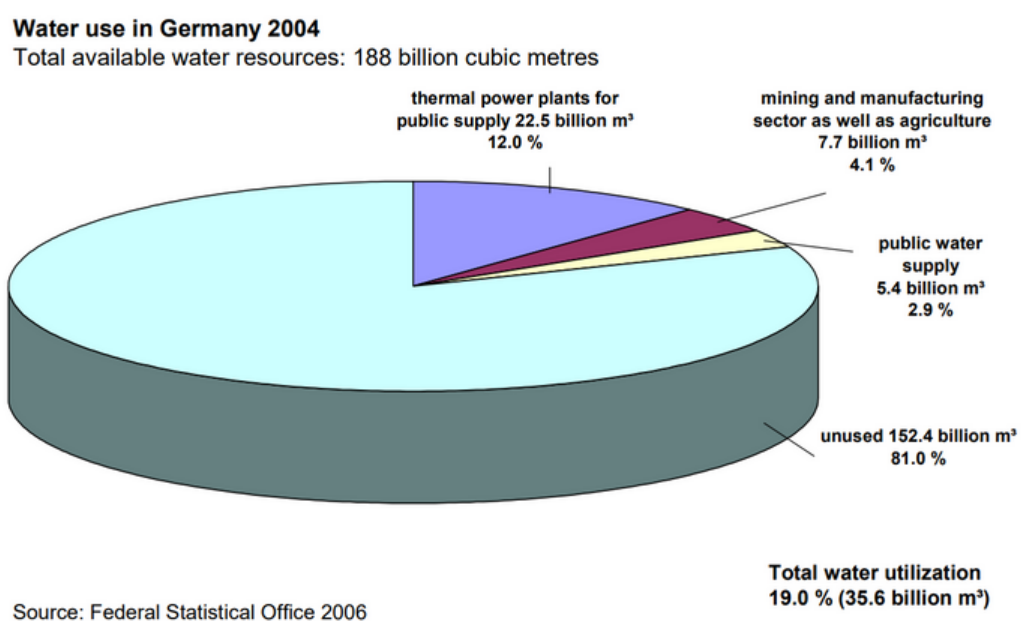


Figure 1: Sectoral Water use in Germany

INDIA: THE QUESTION OF STORAGE STRUCTURES

In India, 28 States and eight Union Territories share 20 major river basins (CWC 2012). The Central Water Commission (CWC) — the key federal body responsible for water management — estimates that the average annual water resource of the basins is 1999.20 BCM. The risk associated with the physical availability of water in India is rather complex. Although CWC studies project India as a 'water scarce' country only by 2051 in terms of per capita water based on the Falkenmark indicator,² India's water stress manifests prominently during dry periods, and due to operation and maintenance related challenges of water resources infrastructure (CWC 2019).

² Falkenmark Indicator is a ratio of a country's water footprint to its total renewable water resources which are a measure of both ground and surface water (blue water) and moisture stored in soil strata (green water).

In sharp contrast to Germany and many other highly industrialized countries, there are sectoral and spatial asymmetries in water usage and water resources infrastructure within India that hinders national consensus on water governance.

In terms of sectoral usage, in a diametrically opposite sense, 75-80 per cent of India's total water demand comes from the agricultural sector, followed by municipal/domestic and industrial use. Although agricultural water use remains essential for the purpose of food security, a lot of vexing policy challenges also stem from the fact that the high proportion of agricultural water use essentially tilts the sectoral balance of water use (See Fig. 2).

Sectoral Water Demand in India (2010)

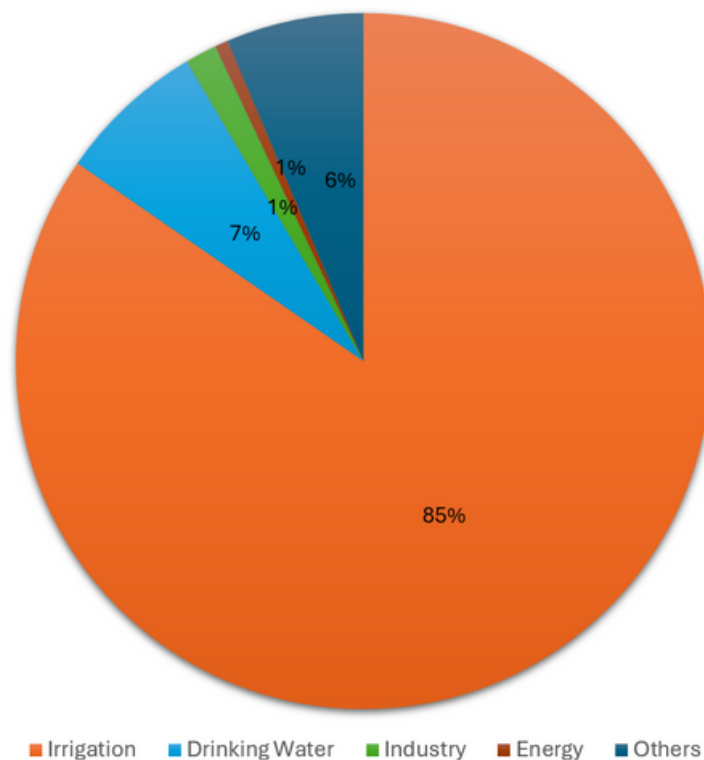


Figure 2: As calculated by water requirement for various sectors assessed by MoWR's "Standing Sub-Committee for assessment of availability and requirement of water," (year 2000)

Many of the water management challenges in India are rooted in significant variations in water availability — on account of inter-regional and inter-basin disparity of water resource endowments and the resulting concerns of equity. For instance, the large peninsular basins in Southern India (such as Cauvery and Krishna) have comparatively lower water resources potential (See Fig. 3) and developed water resources infrastructure — manifesting in subnational water use and distributional conflicts. Contrastingly, basins such as Brahmaputra and Barak with high water resources potential are comparatively underdeveloped. This had led India to pursue a very different set of policies compared to Germany.

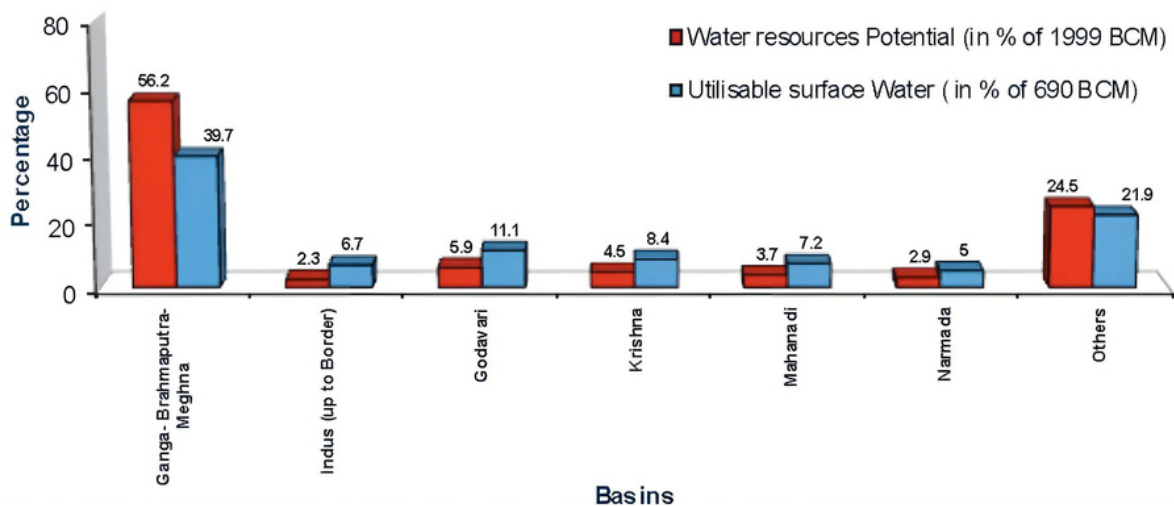


Figure 3: Basin Wise Water Resources Potential vs Utilizable Surface Water (CWC 2012)

In 1980, the National Perspective Plan for water resources development was formulated by the erstwhile Ministry of Water Resources, Government of India to address the pressing concern of inter-regional disparity of water availability and called for equitable distribution through inter-basin transfer (CWC 2021). The recurring policy challenge of regional water imbalance has been addressed by successive National Water Policies (NWP) — NWP 1987, 2002, and 2012 recommended inter-basin water transfer to manage deficit and buffer against climate change impacts. Similarly, in India, on average 1/3rd of the disasters are related to hydro-meteorological events like floods. While the peninsular basins suffer from dry season flow, the Himalayan basins, notably the Ganges and the Brahmaputra, are highly flood-prone. These structural conditions eventually culminated in India's National Water Policy 2012 which prioritised drinking water and irrigation over ecology navigation and other uses.

THE LEGAL CONTOURS OF FEDERALISM: DIFFERENTIATED PULL AND PUSH

The federal design depends on the respective constitutional provisions of the federations. The constitution determines the division of power — ‘functional responsibility’ across a range of policy matters between the federal (centre) and the states as well as conflict mediation mechanisms (Garrick 2014, Bednar 2008). The fundamental rules enshrined by the constitution set the contours of the institutional choices and their character across federations. How do federal constitutions influence the dynamics of pursuing RBM?

GERMANY’S WATER FEDERALISM

Germany displays a distinct model of federal framework often termed as ‘administrative federalism’ that remains central to the praxis of RBM in Germany. Under this model, the concentration of legislative power lies at the federal level while the Länder’s prerogative remains in supplementing the federal legislations that are directed for the purpose of administration and the implementation of the federal legislation in their respective Länder jurisdictions. Although, this might seem as a centralized arrangement, what makes it unique is the various strategic levers given to Länders making them a ‘powerful authority’ — through negotiations at Bundesrat³ that allows Länders the flexibility to adopt and execute decisions in their context specific ways (Hofmann 2021, Hueglin & Fenna 2015). The federal design also manifests in a process that incentivises cooperation in intergovernmental relations — one key feature of the process is that the consensus building and coordination for programmes and policies are negotiated early on (‘backward linkage’) before the actual legislative decisions are finalised (‘forward linkage’). The strengthening of such backward linkages in policy making and legislative affairs often results in a cohesive outcome across a range of policy matters between the two layers of the government.

In contrast, in many of the other federations, there are various constraints on the scope of ‘consensus building’ before policy matters are legislated (Hueglin & Fenna 2015). It must be noted that, even if there have been several amendments to the German Constitution, the basic nature of ‘administrative federalism’ remains the same.

The German constitutional provisions (Basic Law) places high level policy making with regard to water resources management at the national level and implementation at the

³ The German Bundesrat is a legislative body that represents the sixteen Länders (federated states) of Germany at the federal level.

state level (Warwick 2016). It is in this context that Germany's Basic Law assigns concurrent legislative competence to the German Federal Government and the Länder in areas of water protection. The primary piece of legislation guiding Germany's RBM — Federal Water Resource Management Act 2009 (WHG) — is located within this constitutional framework and is characterised by subnational units such as Länder, and other local authorities, exercising their power to supplement the Federal Water Act — for 'procedural reasons' — such as standard setting, implementing context specific measures etc. The German Basic Law allows the Länder to deviate from the federal water legislation. However, such deviations are few, and the federal and the Länder governments synergise their effort towards water quality and flood management.

Germany's regional context also played an influential role. The WHG 2009 has two major objectives — management of water quality and flooding through implementation of the European Union WFD and Flood Directive (FD) respectively (Albrecht 2013, Warwick 2016). It must be noted that the current version of the federal water act has undergone various amendments since 1957 that was directed mainly to accommodate the requirements of the WFD and was primarily achieved by transposition of the WFD requirements to the National and State Water Acts (Petry & Dombrowsky 2008).

GERMANY'S FEDERAL REFORM OF 2006

The experience, however, was far from easy. Germany faced various structural challenges in transposing the WFD requirements due to the contention between the federal government and the Länder on various policy matters resulting in complex and time consuming legislative procedures. Prior to 2006, the German Basic Law provided for 'federal framework legislation' pertaining to water resources management which limited the federal government's role in enacting 'framework legislations' for the Länder to adopt (Müller & Klein 2007). This system was fraught with challenges. For instance, this framework involved legislation at two levels. These federal frictions were viewed as a major impediment in an 'integrated approach for environmental protection' across Germany and proved ineffective in implementation of the various European directives (Müller & Klein 2007). The condition eventually precipitated into the constitutional reform of Germany in 2006 (Müller & Klein 2007).

This 2006 constitutional reform transformed the way Germany managed water and included water in the ‘concurrent list’. It gave the federal government full legislative power in the area of water with Länders having the flexibility to diverge and in case of dispute, the Länder law would prevail. However, the divergence of the Länder legislation is strategically restricted. Germany’s Basic Law allows Länders to enact legislation divergent from that of the federal government with regard to the water resources management with ‘exceptions for regulations related to materials or facilities’. As Müller and Klein (2007) argue, the reason for this exception “lies in the fact that the protection of waters from pollution and from the dangers caused by substances or facilities are "core-areas" of water protection and require uniform legislation that can only be guaranteed by the federal government”

The primary objective of the constitutional reforms was to ‘Europeanize German Water Legislation’ — by developing uniform environmental legislation across Länders by ensuring a stronger federal role in the environmental legislation (Theil 2015). This laid the ground for the nationwide implementation of the EU WFD.

INDIA’S WATER FEDERALISM: AN EVOLVING PROSPECT

The foundation of India’s water federalism, on the other hand, displays a very different orientation compared to Germany’s integrated ‘administrative federalism’ model. India’s federal model is characterised as a response towards accommodating the socio-political fault lines along the territorial lines post independence. The response in this regard was directed in a strong federal (Union Government) role, while also preserving the state autonomy. As argued, over time, India reinvented itself in transitioning from a heavily centralised federation towards a more flexible structure in response to a sea change in India’s political and economic landscape (Tillin 2019). This flexibility allows states to be autonomous, albeit with the Union having various levers — legislative, policy, and financial to influence the states’ decision. Pillai and Dubash (2023) described India’s federalism in the context of climate change governance as somewhere between the US model of federalism (with very low degree of centralization and high degree of state autonomy) and much short of Germany’s model of ‘integrated administrative federalism.’ The other important difference with Germany is that the legislative and policy for pursuing RBM in India is rather complex — with a tapestry of legislation aimed towards management of both water ‘quantity’ and ‘quality’ aspects rather than particularly skewed on ‘quality and ecological focus’ distinct to Germany’s legislative experiences.

The constitutional provision of water management in India is far from simple. The provision related to water management is predominantly under the purview of the state governments subjected to the Union's⁴ power to regulate and develop inter-state rivers and river valleys.⁵ There are various other constitutional provisions where the Centre exerts significant influence on the irrigation projects, and flood control (Bhattacharjee 2022). Under the Union's power, two important pieces of legislation have been constituted: Inter-State River Water Dispute Act 1956 and River Boards Act 1956.

However, this division of power has always come under significant churning and faced opposing forces debating on the right jurisdiction under which water should be located in the Indian constitution. In India, there is a long standing contemplation to move water to the Concurrent list. Concomitantly, there are credible arguments from various fronts that the current constitutional arrangement for water resources management is adequate to address the challenges. Taking into consideration the complex federal challenges, the Union Government of India constituted important commissions — notably the Sarkaria Commission in 1983 and the Punchhi Commission in 2017 to review India's existing arrangements between the Union and the States. These Commissions deliberated on India's water management in the context of its unique federal structure and, in most cases, were of the opinion that water should not be included in the Union or Concurrent list and the existing constitutional arrangement is best suited for India's socio-economic conditions. Policy scholars like Iyer (2011) and Chokkakula (2020) too argued that transferring water to the Concurrent list might turn counter-productive in two aspects. In India's federal structure, which increasingly displays a trend of subnational assertions on policy matters, deep territorialisation, and competitive federalism, such a shift is arguably difficult and second, is an inadequate deployment of the Centre's already existing power under the constitutional framework to address water management challenges.

In this regard, the only exception has been the Ashok Chawla Committee constituted by the Government of India in 2011 to identify the efficacy and suitability of the existing legal and regulatory framework of key natural resources being allocated by the government. The committee recommended that India requires a 'national framework of legislation' and management practices at the basin scale along the lines of the EU WFD. The Chawla Committee was of the opinion that such framework legislation could be possible by placing water under the Concurrent list or by obtaining consensus from a majority of the States. However, India's experience suggests that neither national

⁴ Union and the Centre are used interchangeably in the case of India.

⁵ Entry 56 of the Union List mandates "that regulation and development of inter-state rivers and river valleys to the extent to which such regulation and development under the control of the Union is declared by parliament by law to be expedient in the public interest'.

consensus for framework law nor the idea of water shifting to the Concurrent list had any serious takers.

POLICY THINKING TOWARDS A 'NEW WATER MANAGEMENT PARADIGM' IN INDIA

It must be recognised that India's water federalism discourse is predominantly dominated by quantity concerns and resolution of inter-state water disputes (Chokkakula 2019). There is a strong argument that the role of the centre/union government in the existing constitutional context has been inadequate. For instance, Iyer (1994) has argued that even if water is a state list subject, the existing mechanism provides for sufficient scope and power to the central government to play an important role in the management of inter-state rivers, but the centre has 'abdicated' from its role. Chokkakula et al. (2021) further show that the inability of the central government to engage strategically with the states has created a governance vacuum with states assuming a 'greater and exclusive role in water governance' in India. This is reflected in the disuse of the River Boards Act of 1956, enacted by the Central government under Entry 56 to facilitate inter-state river water management and regulation. The GoI, in recent years, has pursued to overhaul the existing legal and policy framework pertaining to RBM by bringing in two important legislations. First, the River Basin Management Bill (RBM) 2018 that would amend the existing River Boards Act 1956 and facilitate establishment of River Basin Authorities for India's inter-state rivers and river basins. Second, the Draft National Water Framework Law, to present 'general principles' for governing water resources across levels of the government. However, both these pieces of legislation have not been ratified as enough attention was not paid to the political and social factors — and the ways the centre could strategically engage with the states to give a logical ending to these legislations.

WATER QUALITY AND POLLUTION MANAGEMENT: A COMPLEX ENDEAVOUR

The legislative instruments deployed for RBM in India have followed a different pathway for 'quantity' and 'quality' aspects. While the legislation, as discussed above, has hit a roadblock as a consequence of entrenched subnational conflicts, the pollution management legislation inspires confidence. In the 1970s and 1980s, the central government enacted the Water (Control and Prevention of Pollution) Act 1974 (Water Act) and the Environmental (Protection) (EP) Act 1986. The Indian Constitution has provisions wherein the federal government can legislate on matters

related to international treaties (Article 253 of the Constitution), even on matters that are exclusively under state jurisdiction. This provision was creatively deployed by the central government to regulate water quality by enacting the Water Act (Goyal et al. 2021). This resulted in strengthening environmental law making in India, eventually culminating into the Environmental (Protection) Act 1986 — an umbrella legislation to tackle various pollution related issues. For instance, the Water Act of 1974 and the EP Act of 1984 gave statutory backing to the federal body to constitute Central and State Pollution Control Boards (CPCB and SPCB) and formulate Minimal National Standards (MINAS) for various categories of industries and their effluent discharge (water pollutants). On paper, these standards are required to be adopted by State Governments as minimal standards — this translates into subnational bodies having the authority to prescribe more stringent norms but not the authority to relax them. Consequently, amendments to the Water Act empowered the Boards to take direct administrative action, i.e., to close down polluting facilities. The result has been far from satisfactory.

India's institutional and regulatory apparatus — especially the structural challenges of the pollution control boards — has proved to be ineffective in tackling water pollution and quality standards issues (Lele et al. 2021). 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.” However, the recent institutional innovation towards improving federal water governance in the Indian context holds a promising future — the most prominent example is that of restoring the Ganges Basin in India under the large scale Namami Gange Programme (NGP). The National Mission for Clean Ganga (NMCG) - the implementing arm of the NGP - was strengthened by enacting legislation to enforce laws regarding pollution control in the Ganges Basin and reforming the institutional structure to include a three tier governing structure where the union, in close coordination with the state and district governments, could pursue river rejuvenation. This is a first ever attempt where the central government, along with providing significant budgetary allocation, carved out a federal consensus to work with states towards improving water quality and river restoration, albeit with a single basin in focus.

INSTITUTIONS FOR COORDINATION AND COOPERATION

Inter-jurisdictional cooperation is a fundamental element since all RBM requires joint decision making, conflict resolution, and managing sectoral trade-offs. Similarly, the institutions responsible for the management of river basins have wide ranging functional scope — to give effect to inter-state water allocation agreements, financing, conflict mediation, monitoring and enforcement (Garrick et al. 2014). In addition, there is an added layer of complexity — uncertainty associated with climate change risks that demands various forms of cooperation and coordination towards adaptive management (Garrick et al. 2014). How has the cooperation and coordination trajectory diverged in the case of India and Germany to pursue RBM?

THE MANY VERSIONS OF GERMANY'S RIVER BASIN MANAGEMENT

Germany has a mixed experience of experimenting with RBM. Germany has historically been at the forefront of the management of large river basins — both international and domestic transboundary river basins. Internationally, Germany's political commitment to the Rhine restoration programme and being a founding member of the International Commission for Protection of the Rhine (ICPR) has proved to be beneficial. The long history of cooperation over important river basins like the Rhine along with the European environmental policies has led to Germany being aware of the various forms of interdependencies and the benefits of cooperation (Theil 2015). At the domestic level too, Theesfeld and Schleyer (2011) note that the German provinces/states were one of the first to 'develop' institutional mechanisms, protocols, and instruments that are required for 'modern' river basin management. This is well documented in Germany's experience with the Water Users Association and the erstwhile German Democratic Republic's (GDR) experiment with Water Management Authorities. The latter was constituted to institutionalise the 'river basin approach' in the water sector (Petry & Dombrowsky 2008).

However, on the other front, Germany's RBM experience was far from easy owing to its federal structure. Germany faced the complexity of 'institutionalising' RBM owing to the Länders' asserting strong influence on water resource management — especially post the emergence of the EU's increasing role in influencing the domestic water policy and management of the member states (Rüdig & Kraemer 1994). Precisely for this reason, Germany, during the negotiations of the EU WFD, had strong reservations against the obligatory nature of constituting River Basin Organizations (RBOs) as an overarching institutional mechanism to implement the EU WFD — and instead it

successfully lobbied against the binding nature of constituting such RBOs. Consequently, the member states agreed on flexible mechanisms where the 'European Commission may set objectives, but may not define the means towards their achievement' — towards the deployment of the EU WFD (Petry & Dombrowsky 2008). Germany's approach has been to coalesce a river basin approach within the existing federal structure — a move away from the traditional notion of the overarching role of the RBOs to give effect to the WFD domestically.

THE CHALLENGES

Historically, owing to the federal structure and multiple actors, the politics of water governance in Germany has always been 'complex, divergent and highly fragmented' (Rüdiger & Kraemer 1994). The EU WFD, when juxtaposed with Germany's domestic framework of RBM, created a 'classic case of spatial misfit between the 10 river basin districts and 16 state jurisdictions in Germany' (Moss 2004). Although such conditions are typical across various federations, the essence of Germany's institutional response towards RBM has been its ability to craft a German Centric Model — characterised by a move away from the establishment of separate River Basin Authorities with financial and executive powers, often described as 'institutionally hard solutions,' and instead relying on various forms of cooperative mechanisms among the federal states and coordination groups in the implementation of the EU WFD, referred to as 'institutionally soft solutions' (Petry & Dombrowsky 2008, Moss 2004).

The foundations of this approach can be traced back to the German Environmental Policy which from the very start laid down the 'cooperation principle' as an important guiding principle (Rüdiger & Kraemer 1994). This was primarily laid down to 'avoid constitutional problems in setting up new organisations' (Moss 2004) in the federal context. In pursuing WFD and FD, Germany experimented with a model where the RBM plan — with river basin as a unit of governance — was pursued for planning purposes, whereas the implementation relied on the various coordinating and cooperative mechanisms at the subnational level to build consensus — culminating in various institutions at the subnational level. Theesfeld and Schleyer (2013) term it as 'Germany's Light Version of IWRM'. They argue that these cooperation based mechanisms helped in stabilising water management from a complete overhaul of the institutional structure for managing water resources in Germany as a result of the EU WFD. Promising examples of this kind are also observed for the Elbe basin in Germany where the Elbe Länders established a consensus based RBO within Germany that adopted 'non-binding decisions to coordinate water management in basin regions within Germany as required by the WFD' (Theil 2015).

Similar instances can be found in the case of Lower Saxony in Germany where the implementation of the River Basin Management Plans during the transition period from pre-WFD phase was achieved through a ‘non-binding co-ordination fora (RBOs) at basin level’ and support from intergovernmental platforms such as LAWA⁶ (Rowbottom et al. 2022).

THE CASE OF LAWA: INSTITUTIONALISED MECHANISMS TO PURSUE INTER-STATE COOPERATION AND KNOWLEDGE PRODUCTION

The emergence of coordinating institutions — aptly represented by LAWA — remains a key institutional mechanism for water federalism in Germany. LAWA had been pivotal in the implementation of the EU WFD in Germany by building consensus among the Länders for harmonising national and subnational water legislation that was essential in the implementation of the EU WFD. For instance, after the WFD came into force, a ‘LAWA-EU Liaison Committee’ was established and was tasked with effectively coordinating for River Basin Planning across the German federal states through an informal setting (Kempa 2014). One notable instance of LAWA’s role in the RBM was its ability to transform Germany’s flood governance wherein there was a visible shift from the ‘development of flood protection to flood risk management’ through consensus building policy advocacy and providing knowledge support (Hartmann & Albrecht 2014). It further produces strategic knowledge products that support German water management institutions in dealing with climate change.

INTER-STATE COOPERATION IN INDIA: A COMPLEX AND CONTESTED COOPERATION MECHANISM FOR WATER MANAGEMENT

The structural conditions for developing institutions for RBM in India confronts both domestic and regional conditions. The ecological and environmental goals were the driving force for the German Federal states and at a transnational scale, the EU countries cooperated on multiple fronts. On the contrary, Indian and South Asian water cooperation has been impeded by multiple factors. At the national scale, South Asian political economies are heavily dependent on agricultural production, food security concerns, national security, and other developmental goals which have a very different view on the systemic issues of ‘cooperation’ (Wirsing 2007).

⁶ LAWA: Working Group on water issues of the Federal States and the Federal Government represented by the Environment Ministers Conference (UMK) in Germany

WATER CONFLICT RESOLUTION VS. WATER COOPERATION

In India, the cooperative mechanisms are rather at a nascent stage — one in which the ethno-lingual fault lines are enmeshed with use and distributional water conflicts that further manifests in electoral competition (Chokkakula 2018). India's RBM has responded to this by designing institutional mechanisms geared towards addressing conflict resolution rather than cooperation in true sense (Chokkakula 2019). In India's federal context, the idea of pursuing RBM through the constitution of Basin Authorities has not been a recent import. The Damodar Valley Corporation in India was constituted in post-independent India with inspiration drawn from the Tennessee Valley Authority in the USA — for developing India's first multipurpose river valley project — and is often seen as an important marker in India's quest for development and state building in the post-independent era. Since then, various river boards and authorities that were constituted focused restrictively on water use, distributional and infrastructural development related issues and had limited influence in pursuing states to cooperate on a broad range of water related risks. The disuse of the River Board Act of 1956 to constitute any board is a case in point. It is worth noting that even if one of the clauses of the RBA 1956 was to advise the government on the prevention of pollution of the waters of the inter-state river — no such avenues were pursued on how such arrangement could be materialised to shape water quality management of the inter-state rivers.

In view of the above, National Water Policies (2002, 2012) and many of the Government of India constituted Commissions and Committees — the notable being the Irrigation Commission 1972, the National Commission for Integrated Water Resources Development (NCIWRD) 1999, Second Administrative Reforms Commission (ARC) 2005, and Doabia Committee 2012⁷ has time and again recommended to constitute River Basin Organisations to pursue River Basin Management but no such institutional arrangement has been constituted. The translation of recommendation to actionable insight has suffered from the lack of politically pragmatic strategies to work with subnational entities (Briscoe and Malik 2007, Pandit & Biswas 2019) which remains an important prerequisite. The wide ranging difference in the development trajectories of the state has meant that the states resisted such attempts. Although, government appointed commissions were aware of this challenge. For instance, the Doabia Committee underscored the need for 'obligatory' statutory backing from the states for development of basin planning and management.

⁷ Report of the Committee to study the activities that are required for optimal development of a river basin and changes required in existing River Boards Act, 1956 for achievement of the same.

INTER-STATE COUNCIL: POTENTIAL INSTITUTIONAL PLATFORM FOR INDIA?

Most of the federations have various forms of institutional mechanisms to drive inter-governmental relations that might not be dedicated to water per se. India, too, boasts of a strong avenue for this. The National Development Council — the apex body for deliberations on development matters in India recommended that national water plans should be prepared keeping in view the national perspective as well as State and regional needs. Accordingly, the GoI in 1983 set up the National Water Resources Council (NWRC). NWRC, comprising members from both the Union and the state governments, has been envisioned to review the progress of implementation of the stipulations of the National Water Policy and also initiate effective measures for systematic development of the country's water resources. The vitality of NWRC — as an avenue for negotiation and dispute resolution for the development of a national perspective on water resources development was underscored by the Commission of Centre-State Relations (Sarkaria Commission) constituted by the GoI. On a similar note, the Inter-State Council was constituted under Article 263 in 1990 to deliberate on various federal matters. However, these platforms have not been pursued effectively to craft India-centric water management strategies (Chokkakula et al. 2021, Chokkakula 2019).

ALL INDIA STATE WATER MINISTERS' CONFERENCE: A SHARED VISION FOR INDIA'S WATER SECURITY?

The importance of subnational entities and a platform for federal cooperation to strategise India's long-term water policy needs has gained some traction of late. To an extent, the need has prompted the central government to convene the first All India State Water Ministers' Conference in 2023 to frame a "Water Vision for India till 2047 as part of the larger plan of India@2047." Following up with the first conference, the 2nd Conference was organised in 2025, where the states were represented by the relevant ministries that discussed unique subnational challenges, policy priorities and solicited various federal support across a range of strategic policy and investment matters. Although it is too early to attribute the convening as an 'institutional platform' to forge water-related cooperation, the high-level convening displays a recognition that it is crucial to engage with the states in managing India's river basins and long-term water security needs.

CONCLUSION AND DISCUSSION

This comparative study shows the stark contrast between Indian and German Water Federalism in pursuing RBM. The highly contextual hydro-climate and ensuing hydropolitics in the two regions elucidates the often different goals and objectives of the legislation, policy, and institutional mechanisms that were developed as a response towards it. This underscores why shifting focus to the domestic front holds the key for water related cooperation between vastly different contexts.

The hydro-climatic conditions which influenced Germany's development and water policy goals and priorities favoured water quality, pollution, and flood risk management. Overall, there is no water use prioritisation in Germany's Water Policy (given Germany is a water surplus nation) and minimal inter-regional and inter-sectoral allocational conflicts, although 'water quantity' related conflicts are increasingly gaining traction. In comparison, India's water resource development has been skewed towards agricultural development and ensuring food security and until recently, quality concerns at the basin level have not captured the public and policy interest. There are high degrees of inter-state and inter-basin variation with regards to water endowments manifesting in inter-sectoral and inter-state allocational and distributional conflict. In addition, the scale and scope of pollution management has suffered from various economic, political, and organisational deficits. However, the recent efforts show promising potential — notably the Namami Gange Programme (NGP).

The historical context in which the constitutional provision evolved in the two federations also vary widely — the case of 'integrated administrative federalism' in Germany vis-à-vis India's federal form of 'union of states'. Locating Germany's water federalism has been shaped and reshaped by Europeanization of Germany's legal and policy landscape and primarily driven by water quality and ecological concerns. In doing so, Germany's legislative goal has been towards harmonising standards and protocols that are uniform across the federation and aimed towards implementation of the EU WFD.

India took a very different approach. The characteristics of India's water federalism have been dominated by quantity concerns and resolution of inter-state water conflicts. The primary concerns of river rejuvenation and environmental quality management have taken a complicated form — and implementation and enforcement of regulatory powers still remains inadequate. Instead, judicial and quasi-judicial avenues play an important role in exercising authority in the prevention of environmental pollution.

The institutional response, in a similar fashion, has been crafted *sui generis* in both cases as a response to the issue at hand. Germany's experience with a long history of being party to international and regional conventions, treaties, and river commissions such as ICPR ensured knowledge and policy diffusion in the domestic context. This ensured that German political actors acknowledged the critical interdependencies among the riparians in managing environmental risks and the resulting economic benefits of cooperation (Theil 2015). Domestically too, Germany pursued institutional design for RBM through various 'cooperation based' mechanisms — such as coordination groups or RBOs that provided a platform for consensus based non-binding decision making. A notable instance in this regard is LAWA that institutionalised coordination and facilitated political consensus among the Länders for implementation of the EU WFD and flood governance. LAWA also helped develop credible and robust knowledge products for acceptance among Länders for improving the federal water governance. In India, on the contrary, the institutional design for inter-state cooperation on water quality/pollution management are still at a nascent stage and the imperatives of leveraging inter-state cooperation to reap benefits of various interdependencies addressing environmental risks have not been realised enough. Pragmatic policy recommendations like empowering the Inter-State Council to achieve federal consensus through an inclusive and deliberative process are yet to be undertaken for managing inter-state river governance (Chokkakula et al. 2021). In recent years, however, there have been visible shifts where environmental and political challenges are prompting the federal government to innovate ways in engaging with the states, such as the All India Annual States' Ministers Conference, in charting India's long term water security goals.

WAY AHEAD: STATES AS 'ENABLER' OF INTERNATIONAL COOPERATION

The recent paper titled Focus on India adopted by the German cabinet further bolsters the rationale for Indo-German partnership at the intersection of water management and federalism with a potential to reinforce the existing India-Europe Water Partnership (IEWP) in three interconnected ways. First, Germany is of the view that India is an 'indispensable partner for Germany' for cooperation related to environmental protection and climate action. Second, in terms of strategic goals, Germany acknowledges the critical importance of collaborating with India at the subnational scale as well as on matters related to legislative and parliamentary affairs. This is well expressed in Germany's commitment to advance an alliance between German and Indian states as well as step up exchange programmes between parliamentarians of the two nations. There are already notable instances of this — Bavaria and the Indian State of Karnataka in 2007 and Baden-Württemberg with Maharashtra in 2015 entered into formal cooperation on a wide range of political, economic, and environmental matters. Third, Indo-German bilateral relationship is meant to complement and strengthen the existing India-EU partnership, since Germany views its relationship with India as a continuation, and in consistency with the 'European Union's common policy on India'. Building on these strategic partnerships between the subnational entities, the path to scale them to a national level will have its own challenges in India, given the vastly different contexts and hydroclimatic conditions even between Indian states. But the start looks promising and the display of intent by both parties is a testament to the deepening ties between the two countries. It will bode well for policymakers and researchers to follow this bilateral partnership closely, particularly in the arena of water and environmental management.

BIBLIOGRAPHY

Aamer, F. (2021). *Introduction International Hydro-diplomacy: Building and Strengthening Regional Institutions for Water Conflict Prevention*.

Albrecht, J. (2013). The Europeanization of water law by the Water Framework Directive: A second chance for water planning in Germany. *Land Use Policy*, 30(1), 381-391.

<https://doi.org/https://doi.org/10.1016/j.landusepol.2012.04.009>

Bednar, J. (2008). *The Robust Federation: Principles of Design*. Cambridge University Press. <https://doi.org/DOI: 10.1017/CBO9780511819445>

Benz, A. (2007). Inter-Regional Competition in Co-operative Federalism: New Modes of Multi-level Governance in Germany. *Regional & Federal Studies*, 17(4), 421-436. <https://doi.org/10.1080/13597560701691797>

Bhattacharjee, G. (2022). Water Federalism: Policy and Institutional Frame. In *India's Water Federalism: New Perspectives for Public Policy*. Hanns Seidel Foundation and Asian Confluence.

Blackbourn, D. (2007). *The Conquest of Nature: Water, Landscape, and the Making of Modern Germany*. W. W. Norton & Company.

Briscoe, J. (2014). The Harvard Water Federalism Project – process and substance. *Water Policy*, 16(S1), 1-10. <https://doi.org/10.2166/wp.2014.001>

Briscoe, J., Malik, R. P. S., & Bank, W. (2007). *Handbook of Water Resources in India: Development, Management, and Strategies*. Oxford University Press.

Chokkakula, S. (2017). *Why do interstate water disputes emerge and recur? An anatomy of ambiguities, antagonisms and asymmetries*. Centre for Economic and Social Studies.

Chokkakula, S. (2018). Transboundary politics of cooperation: Telugu ganga project, India. *Regional Environmental Change*. <https://doi.org/10.1007/s10113-018-1348-0>

Chokkakula, S. (2019). *Interstate River Water Governance: Shifting the Focus from Conflict Resolution to Enabling Cooperation*. In C. f. P. Research (Ed.), *Policy Challenges 2019-2024: Charting a New Course for India and Navigating Policy Challenges in the 21st Century*. Centre for Policy Research.

<https://cprindia.org/sites/default/files/Policy%20Challenges%202019-2024.pdf>

Chokkakula, S. (2020, 18 September). India's response to Covid-19 reflects the power, problems, potential of federalism. *The Indian Express*.

Chokkakula, S., Kapur, A., & Singh, A. (2021). *Water and federalism: Working with states for water security*.

Garrick, D. E., Anderson, G. R., Connell, D., & Pittock, J. (2014). *Federal rivers: managing water in multi-layered political systems*. Edward Elgar Publishing.

Goppel, J.M. (1991) Legal Aspects of International Water Management: The Rhine, *Canadian Water Resources Journal / Revue canadienne des ressources hydriques*, 16:3, 253-260, DOI: 10.4296/cwrj1603253

Grey, D., & Sadoff, C. W. (2007). Sink or Swim? Water security for growth and development. *Water Policy*, 9(6), 545-571.

<https://doi.org/10.2166/wp.2007.021>

Hartmann, T., & Albrecht, J. (2014). From Flood Protection to Flood Risk Management: Condition-Based and Performance-Based Regulations in German Water Law. *Journal of Environmental Law*, 26(2), 243-268.

<https://doi.org/10.1093/jel/equ015>

Hofmann, H. (2021). Europeanisation and German Public Administration. In (pp. 53-60). https://doi.org/10.1007/978-3-030-53697-8_4

Hueglin, T. O., & Fenna, A. (2006). *Comparative Federalism: A Systematic Inquiry*. Broadview Press.

Iyer, R. R. (1994). Federalism and Water Resources. *Economic and Political Weekly*, 29(13).

Iyer, R. R. (2011). Should water be moved to Concurrent List? *The Hindu*.

Klein, B., & Müller, U. (2007). The New Legislative Competence of "Divergent State Legislation" and the Enactment of a Federal Environmental Code in Germany. *Journal for European Environmental & Planning Law*, 4(3), 181-194. <https://doi.org/https://doi.org/10.1163/187601007X00190>

Köck, W. (2012). Water Management and Protection in Germany. In (pp. 315-337). https://doi.org/10.1163/9789004235250_015

Kosow, H., Brauner, S., Brumme, A., Hauser, W., Hölzlberger, F., Moschner, J., Rübbelke, D., Vögele, S., & Weimer-Jehle, W. (2024). Uncharted water conflicts ahead: mapping the scenario space for Germany in the year 2050. *Frontiers in Water*, 6, 1492336. <https://doi.org/10.3389/frwa.2024.1492336>

Lele, S., Jamwal, P., & Menon, M. (2021). Challenges in Regulating Water Pollution in India Standards, Monitoring, Enforcement and Accountability. *Economic and Political Weekly*, 56, 46.

Molle, F. (2009). River-basin planning and management: The social life of a concept. *Geoforum*, 40(3), 484-494. <https://doi.org/https://doi.org/10.1016/j.geoforum.2009.03.004>

Mollinga, P. P. (2006). IWRM in South Asia: A Concept Looking for a Constituency.

Moore, S. M. (2018). *Subnational Hydropolitics: Conflict, Cooperation, and Institution-building in Shared River Basins*. Oxford University Press.

Moss, T. (2004). The governance of land use in river basins: prospects for overcoming problems of institutional interplay with the EU Water Framework Directive. *Land Use Policy*, 21(1), 85-94. <https://doi.org/https://doi.org/10.1016/j.landusepol.2003.10.001>

Mostert, E. (2009). International co-operation on Rhine water quality 1945–2008: An example to follow? *Physics and Chemistry of the Earth, Parts A/B/C*, 34, 142-149. <https://doi.org/10.1016/j.pce.2008.06.007>

Pahl-Wostl, C. (2019). The role of governance modes and meta-governance in the transformation towards sustainable water governance. *Environmental Science & Policy*, 91, 6-16. <https://doi.org/https://doi.org/10.1016/j.envsci.2018.10.008>

Pandit, C., & Biswas, A. K. (2019). India's National Water Policy: 'feel good' document, nothing more. *International Journal of Water Resources Development*, 35(6), 1015-1028. <https://doi.org/10.1080/07900627.2019.1576509>

Petry, D., & Dombrowsky, I. (2007). River Basin Management in Germany: Past Experiences and Challenges Ahead. *Advances in the Economics of Environmental Resources*, 7, 11-42. [https://doi.org/10.1016/S1569-3740\(07\)07002-2](https://doi.org/10.1016/S1569-3740(07)07002-2)

Pillai, A. V., & Dubash, N. K. (2023). Climate Governance and Federalism in India. In A. Fenna, S. Jodoin, & J. Setzer (Eds.), *Climate Governance and Federalism: A Forum of Federations Comparative Policy Analysis* (pp. 177-197). Cambridge University Press. <https://doi.org/DOI: 10.1017/9781009249676.010>

Rajamani, L. (2007). Public Interest Environmental Litigation in India: Exploring Issues of Access, Participation, Equity, Effectiveness and Sustainability. *Journal of Environmental Law*, 19(3), 293-321. <https://doi.org/10.1093/jel/eqm020>

Rowbottom, J., Graversgaard, M., Wright, I., Dudman, K., Klages, S., Heidecke, C., Surdyk, N., Gourcy, L., Leitão, I. A., Ferreira, A. D., Wuijts, S., Boekhold, S., Doody, D. G., Glavan, M., Cvejić, R., & Velthof, G. (2022). Water governance diversity across Europe: Does legacy generate sticking points in implementing multi-level governance? *Journal of Environmental Management*, 319, 115598. <https://doi.org/https://doi.org/10.1016/j.jenvman.2022.115598>

Rüdiger, W., & Kraemer, R. A. (2007). Networks of Cooperation: Water Policy in Germany. *Environmental Politics*, 3, 52-79. <https://doi.org/10.1080/09644019408414167>

Shah, T., Makin, I., & Sakthivadivel, R. (2006). Limits to leapfrogging: issues in transposing successful river basin management institutions in the developing world. In (pp. 31-49). <https://doi.org/10.1079/9780851996721.0031>

Theesfeld, I., & Schleyer, C. (2011). *Institutional Requirements for Integrated Water Resource Management in Germany*

Theesfeld, I., & Schleyer, C. (2013). Germany's Light Version of Integrated Water Resources Management. *Environmental Policy and Governance*, 23(2), 130-144.
<https://doi.org/https://doi.org/10.1002/eet.1602>

Thiel, A. (2015). Constitutional state structure and scalar re-organization of natural resource governance: The transformation of polycentric water governance in Spain, Portugal and Germany. *Land Use Policy*, 45, 176-188.
<https://doi.org/https://doi.org/10.1016/j.landusepol.2015.01.012>

Tillin, L. (2019). *Indian Federalism*. Oxford University Press.

Wackerbauer, J. (2009). *The Water Sector in Germany*. International Centre of Research and Information on the Public, Social and Cooperative Economy.
<https://www.ciriec.uliege.be/wp-content/uploads/2015/11/WP09-11.pdf>

Warwick, F. (2016). Surface Water Strategy, Policy and Legislation. In *Sustainable Surface Water Management* (pp. 31-44).
<https://doi.org/https://doi.org/10.1002/9781118897690.ch3>

Wirsing, R. G. (2007). Hydro-Politics in South Asia: The Domestic Roots of Interstate River Rivalry. *Asian Affairs*, 34(1), 3-22.
<http://www.jstor.org/stable/30173030> (Taylor & Francis, Ltd.)