The Illusions of Liquid Rulers

The Interlinking of Rivers

The Ken-Betwa Linking Project: A Review

Rohil Vaidya

October 2022

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Preface

The conventional notion of the hydrocracy in India is that 'Every drop of water that flows to the sea is a waste'. Therefore for decades together the water resources infrastructure in India has been following the command-and control hydrological paradigm. Interlinking of Rivers is just another attempt but at a much larger scale. This report hopes to synthesize the extensive but diffused debate around the Interlinking of Rivers, specifically taking the case study of the Ken Betwa Linking Project. The idea to link India's rivers is here to stay – at least for a while, and if realized, will leave lasting, perhaps, irreversible legacies. The idea warrants public scrutiny and open discussion to ensure appropriate and transparent water governance (that considers the possibility that the idea is entirely misplaced); for justice to those in dire need of equitable access to water and the right to a justice and life. Finally, the report also attempts to present a critical analysis of the hydrocracy, trying to understand why the hydrocracy continues to flounder despite attempts made at reform, pointing to an underlying political economy that sustains the networks of power needed by large hydrocratic institutions. For a country dependent on rainfed agriculture like India, water flows are highly tied to flows of power and control over water is a highly valuable political resource.

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I would like to express my gratitude to Prof. Rajeswari Raina for introducing me to the fields of Ecological Economics and Political Ecology during my undergraduate study at Shiv Nadar University. In her role as an educator, she introduced me to new questions and perspectives on the global economy and resource governance, without which this report would have suffered greatly. I am also indebted to her interest and kindness outside the classroom in introducing me to the Water Conflicts Forum and their work.

I would be remiss to ignore the contributions of all my other professors at Shiv Nadar University, who not only shaped my critical thinking, but helped a fresh-faced school graduate open his eyes to the possibilities the world had on offer. To my family and friends, as always, my love and appreciation. Our countless wayward but spirited arguments often left me restless and annoyed, but never failed to refresh my critical thinking.

The bulk of this report was written during the height of the COVID-19 pandemic, which will remain a dark and fatiguing time in our collective memories, and a material reality that seems like it is here to stay. To everyone, those named and unintentionally missed, for your time and energy, I will always be grateful. Now more than ever we have been

reminded of the need to ensure resilient ecosystems and fundamental ecological rights that go beyond parochial anthropocentricities, and I hope this report is a tangible contribution to such a transformation.

As always, the responsibility for any errors in the report are mine alone.

Rohil Vaidya

List of Acronyms

(In order of appearance)

Acronym	Explanation
ILR	Interlinking of Rivers
IBWTs	Inter Basin Water Transfers
RLPs	River Linking Projects
RIPs	River Interlinking Projects
NPP	National Perspective Plan
NWDA	National Water Development Agency
DoWR, RD&GR	Department of Water Resources, River Development & Ganga Rejuvenation
MoJS	Ministry of Jal Shakti
PMKSY	Pradhan Mantri Krishi Sinchai Yojna
AIBP	Accelerated Irrigation Benefits Programme
S&Is	Surveys and Investigations
FRs	Feasibility Reports
DPRs	Detailed Project Reports
NRLP	National River Linking Project
MSTG	Manas-Sankosh-Tista-Ganga
KBL	Ken-Betwa Link
KBLP	Ken-Betwa Linking Project
NDA	National Democratic Alliance
MPVRD	Multipurpose River Valley Development
CWINC	Central Water, Irrigation and Navigation Commission
CWC	Central Water Commission
NCIWRDP	National Commission for Integrated Water Resources Development Plan

MP	Member of Parliament
UPA	United Progressive Alliance
BJP	Bhartiya Janata Party
INC	Indian National Congress
BCM	Billion Cubic Meters
NCAER	National Council of Applied Economic Research
FRL	Full Reservoir Level
CCA	Culturable Command Area
NIH	National Institute for Hydrology
MCM	Million Cubic Metres
PTR	Panna Tiger Reserve
NBWL	National Board for Wildlife
FAC	Forest Advisory Committee
SC NBWL	Standing Committee of the NBWL
CEC	Central Empowered Commission
EAC	Expert Appraisal Committee
NGT	National Green Tribunal
EIA	Environmental Impact Assessment
TOR	Terms of Reference
MoEF	Ministry of Environment and Forests
MPPCB	Madhya Pradesh Pollution Control Board
MoEFCC	Ministry for Environment Forests and Climate Change
LMP	Landscape Management Plan
NABARD	National Bank for Agriculture and Rural Development
India EXIM Bank	India Export Import Bank
SBI	State Bank of India
WLS	Wildlife Sanctuaries
EMP	Environmental Management Plan

PSI	People's Science Institute
JNU	Jawaharlal Nehru University
SANDRP	South Asia Network on Dams, Rivers and People
WCD	World Commission of Dams
RVP	River Valley Projects
CBA	Cost Benefit Analysis
MLA	Member of Legislative Assembly

Executive Summary

The Interlinking of Rivers (ILR) refers to the linking of two or more distinct river systems through anthropogenic hydraulic interventions for the purpose of water transfer. To achieve this, dams, canals, tunnels, and other infrastructure is used to transfer water from one river basin to another. In India, the most significant benefits suggested are the storage and supply of freshwater for human consumption, irrigation, and industrial use. Attendant benefits are also suggested in hydroelectricity generation, simultaneous flood and drought mitigation, and the creation of waterways for transport. These supposed benefits, analysed in this report, are out-balanced by well-known risks. Not only are the risks and impacts of any large hydraulic intervention presents, but issues specific to the linking separate river basins are also introduced. The idea of interlinking has thus drawn contestations specific to the "river linking" archetype, understood as a consequence of problematic water governance practices.

The concept of interlinking has been christened many names over its long history, including Inter Basin Water Transfers (IBWTs), River Linking Projects (RLPs) and River Interlinking Projects (RIPs). This article will use the term 'ILR' since it has become the standard terminology of choice in governmental and non-governmental parlance, including relevant government documents, court orders, journal articles and most contemporary sources.

This report hopes to serve as a synthesis of the extensive but diffused debate around the subject of the Ken Betwa Linking Project (KBLP), the ILR and the related issues of the Indian hydrocracy, bringing together existing literature from government bodies, non-government organisations, and academia, to verify and analyse the claims made by the proponents and opponents of the ILR. The idea to link India's rivers is here to stay – at least for a while, and if realized, will leave lasting, perhaps, irreversible legacies. The idea warrants public scrutiny and open discussion to ensure appropriate and transparent water governance (that considers the possibility that the idea is entirely misplaced); for

justice to those in dire need of equitable access to water and the right to a justice and life.

Multiple issues that plague the project have been highlighted in detail in the report, the most crucial of which have been summarised here.

1. The KBLP suffers from many project-specific issues, which have developed over its long-winded history. These issues are critical for the rest of the KBLP and the ILR project as a whole, since they are manifestations of long-standing problems within Indian water governance and will set a precedent for future river-linking projects. These include:
    a. The recommendations of government clearance authorities were ignored by the NBWL (National Board for Wildlife).
    b. The problematic history of the EAC (Expert Appraisal Committee) responsible for clearing Phase-I including worrying conflicts of interest, lack of due process with public hearings, and flouting the government's own guidelines.
    c. Lack of public data to verify the claims made by the NWDA and associated bodies
    d. Unscientific claims that plague the whole EIA (Environmental Impact Assessment) report, also reflected in the DPR (Detailed Project Reports) and EIA.

2. Beyond procedural issues, fundamental issues have also been highlighted including:
    a. Lack of any awareness to climate change effects and how permanent water infrastructure is bound to exacerbate its effects like already seen multiple times in Uttarakhand, Himachal Pradesh and the North East.
    b. Upon verification by independent scientific bodies, the basic scientific justifications of the KBLP are also not met. The claim of the Ken having "surplus" water is thus false
    c. The PTR (Panna Tiger Reserve) will be irreversibly damaged, despite being a success story of India's Project Tiger, since the EIA does not satisfactorily justify how ecological damage will be avoided. This damage has been highlighted in the reports of the NBWL and Forest Advisory Committee (FAC).

d. The CEC (Central Empowered Commission) of the Supreme Court also highlighted major issues with the project as a whole, which were ignored by the NWDA, and the project has gone ahead regardless of pending cases in the Supreme Court.
e. The majority of those affected by the dam and the transfer of water away from the Ken belong to SC/ST/OBC communities, who are already undersupplied by the government within the Ken basin. This creates the image of a false lack of consumption. On the other hand the Betwa supplies industries, towns, and cities, which are already consuming and polluting their water sources heavily. This facet of a political imbalance was pointed out by the Supreme Court as well.
f. It is troubling that no alternatives to the KBLP/ILR were studied in detail, and it has been assumed that ILR is the only possible way to secure water futures for Bundelkhand and India.

The criticism by experts from both within and outside the government have also been highlighted, pointing to a widespread agreement on the disastrous nature of the project. Considering that some of these criticisms were made by government officials in power, and the fact that it is a rare occurrence to see dissent from those still in power and holding office, the precarity of the situation is made clear.

The fundamental assumption that justifies ILR is the classification of river basins as 'surplus' water basins and 'deficit' water basins. The interlinkage then serves to transfer water from the former to the latter, towards the supposed benefit of both regions. The link would not only provide water to water-scarce regions, but also manage flooding in the donor basin. Flood and drought control can also be achieved, since floodwater flows from 'surplus' basins would be transferred to 'deficit' basins facing a drought – mitigating the risks faced by all those who live in these basins. This report has found that this claim is false on multiple levels. Most importantly, rivers have natural flow rates that create specific ecologies around them. Heavily changing these rates, like dams already do, causes great damage, and linking multiple basins will lead to multiple unintended and unpredictable consequences. The report also looks at issues that are fundamental to the ILR project as a whole, pointing out academic literature on biodiversity issues,

climate change, sensitive international politics, and the past track record of resettlement and rehabilitation.

The KBLP looks to transfer water from an already water-scarce regions around the Ken, to a region of relative prosperity in Bhopal, Raisen, and Vidisha, while speaking to false promises of equitable water distribution. The Indian hydrocracy has transplanted many colonial-era water governance techniques and imposed a parochially self-serving structure – uncaring for those it leaves out or condemns. The ILR is another attempt at resuscitating India's failing command-and-control supply-side hydrological paradigm, where the working parts of the ILR are identical to conventional forms of large-scale and permanent hydraulic interventions, only bundled together in one large scheme, mostly for the purposes of convenient policy recommendation. This paradigm has been rightfully criticised multiple times, a glimpse of which is given in this report as well, and the hydrocracy needs to search for alternatives.

Finally a critical analysis of the hydrocracy is given, trying to understand why the hydrocracy continues to flounder despite attempts made at reform, pointing to an underlying political economy that sustains the networks of power needed by large hydrocratic institutions. For a country dependent on rainfed agriculture like India, water flows are highly tied to flows of power and control over water is a highly valuable political resource.

The hydrocracy is set in institutionalised rules, norms and behaviours that have dominated Indian water policy discourse since the 1950s. Its concern for "the people" is its stated mission – as all government projects, but its imagination, claims, and designs are plagued by the age-old problems of archaic governmentality only in new packaging, fraught with irreversible blunders waiting to happen. It is disturbing to see that the "professionalised" bureaucracy of India, continues to deprive those who have been historically marginalised, despite being made cognisant of the damaging consequences of their dominant practices.

The NWDAs raison d'être of constructing interlinking projects is fundamentally flawed. The NWDA, along with much of the Indian hydrocracy, has shown disregard and ignorance towards ecological protections, all the while pushing a dangerous agenda

unchecked, shrouded within dense and poorly-managed institutional jargon, looking to turn the public away from dissecting and critiquing the fundamental assumptions of the project. Owing to the lack of clarity within the hydrocracy itself, the hydrocracy is able to play it by the ear, shuttling projects that only seem to appease the reigning powers that be.

The KBLP and the ILR thus must be rejected, since there is absolutely no scope for improvement in projects so fundamentally disastrous. The robotic application of long-disproved hydraulic interventions has led to immense anthropogenic strain on Indian rivers. Despite a blinkered hydrocracy that chooses to ignore dissent, it must be repeated once again; democratic, transparent and contextual interventions that engage with non-anthropocentric perspectives and prioritise those marginalised and affected most greatly by projects are critical for effective water governance, especially in response to the increasingly ominous challenges of climate change.

The lessons of the past all point to large-scale, often state-sponsored interventions damaging and disrupting rather than making the environment conducive towards sustainable and just living. The changing climate, increasing economic inequity, and political polarisation will all strain human access to natural resources in unexpected and complex ways. In response to these uncertainties, archaic and problematic responses to human needs cannot be applied as traditional remedies, and a critical look at the system is necessary to create effective solutions towards water justice. It is the sincere hope of this report that the ILR is given a strong repudiation by not only the Supreme Court, but all those in positions of responsibility, and that the hydrocracy reconsiders its approach in line with a progressive and inclusive philosophy. The recommendation already-made to the government in 2014 are a great place to start, not viewed as rivalrous ideas, but as possibilities for collaboration, moving towards better water futures.

Introduction

The Interlinking of Rivers (ILR) refers to the linking of two or more distinct river systems through anthropogenic hydraulic interventions towards water transfer. To achieve this, dams, canals, tunnels, and other water engineering infrastructure is used to transfer water from one river basin to another. In India, the most significant benefits suggested are the storage and supply of freshwater for human consumption, irrigation, and industrial use. Attendants benefits are also suggested in hydroelectricity generation, simultaneous flood and drought mitigation, and the creation of waterways for transport. These supposed benefits, analysed in this report, are out-balanced by well-known risks. Not only are the risks and impacts of any large hydraulic intervention present, but issues specific to the linking of separate river basins also become relevant. The idea of interlinking has thus drawn contestations specific to the 'river linking' archetype, understood as a consequence of problematic water governance practices.

The concept of interlinking has been christened many names over its long history, including Inter Basin Water Transfers (IBWTs), River Linking Projects (RLPs) and, River Interlinking Projects (RIPs). There is opposition to the usage of 'ILR' from some interlinking enthusiasts who prefer the term IBWT, their issue being that 'links' would suggest a reversible movement while transfers are one-way. This article will use the term 'ILR' since it has become the standard terminology of choice in governmental and non-governmental parlance, including relevant government documents, court orders, journal articles, and most contemporary sources.

The fundamental assumption that justifies ILR is the classification of river basins as 'surplus' water basins and 'deficit' water basins. The interlinkage then serves to transfer water from the former to the latter, towards the supposed benefit of both regions. The link would not only provide water to water-scarce regions but also manage flooding in the donor basin. Flood and drought control can also be achieved, since floodwater flows from 'surplus' basins would be transferred to 'deficit' basins facing a drought – mitigating the risks faced by all those who live in these basins (NWDA, 2018).

This report aims to bring together existing literature from government bodies, non-government organisations, and academia, to verify and analyse the claims made by the proponents and opponents of the ILR. This report is split into 12 sections, encompassing a range of perspectives. It opens with a brief background on the ILR within India tracing it back to colonial administrative projects, and follows its history to contemporary Indian water governance. Second, an overview of the water-related challenges that the ILR claims to tackle is given, based on dominant *government* discourse. Third, the Ken-Betwa Link Project (KBLP) is looked at specifically as given in government documents, in context to the ILR scheme(s) at large. Fourth, criticisms of the ILR and KBLP schemes as a whole are considered from different perspectives. The criticisms pointed out, based on procedural issues, poor documentation and scientific studies, and the social, political and ecological consequences of ILR projects, are then brought to bear on the hydrocratic governance paradigms in India to discuss why the ILR is not an outlier, but rather a predictable policy intervention, made by a technocentric hydrocratic system beset with long-standing challenges. There are three levels of analysis looked at in the report, analysis begins with the KBLP specifically, which then broadens into a discussion about the ILR, which then further broadens to a critique of the hydrocracy as a whole. This report can thus be read thematically, with a focus on specific sections, since it is meant to be wide-ranging at the expense of subject depth. The fifth section concludes, noting central insights.

This report hopes to serve as a synthesis of the extensive but diffused debate around the subject of the KBLP, the ILR and the related issues of the Indian hydrocracy. The idea to link India's rivers is here to stay – at least for a while, and if realized, will leave lasting, perhaps irreversible legacies. The idea warrants public scrutiny and open discussion to ensure appropriate and transparent water governance (that considers the possibility that the idea is entirely misplaced); for justice to those in dire need of equitable access to water and the right to life.

Contemporary Background for the Interlinking of Rivers

The National Perspective Plan (NPP) for water development that was framed by the erstwhile Ministry of Irrigation in August 1980 advocated for the ILR as a solution for India's water problems. The National Water Development Agency (NWDA) was created in 1982 under the Ministry of Irrigation as a professional hydrocracy organisation, to study and design potential interlinking projects (NWDA, n.d.-d). Initially limited to 'Peninsular' links, the scope was expanded to include 'Himalayan' links in 1994.

The NWDA now falls under the Department of Water Resources, River Development & Ganga Rejuvenation (DoWR, RD&GR) within the Ministry of Jal Shakti (MoJS). Over time the scope of the NWDA's responsibilities has been expanded to include financial roles and project-specific functions – under the Pradhan Mantri Krishi Sinchai Yojana (PMKSY) and Accelerated Irrigation Benefits Programme (AIBP). The NWDA is the chief central government agency responsible for interlinking projects, which include inter-state links and intra-state links taken up at the behest of State Governments (NWDA, n.d.-c; NWDA, n.d.-d).

The NWDA is primarily responsible for identifying possible basins to interlink, carrying out surveys and investigations (S&Is) of the basins identified, preparing Feasibility Reports (FRs) for the regions surveyed, and preparing Detailed Project Reports (DPRs) for interlinking projects deemed 'feasible'. The NWDA is required to carry out "water balance" studies to identify potential 'surplus' and 'deficit' basin groups that can be linked. These studies quantify the water 'budget' of an area by looking at all available sources of water throughout the year in a region and the anthropogenic use of water while accounting for some required ecological runoff. If there is greater supply than consumption, the area is considered to hold a surplus and conversely, the area can be considered to hold a deficit. A countrywide interlinking scheme has been proposed by the NWDA under the National River Linking Project (NRLP), although the term 'ILR' is often used interchangeably (by the NWDA itself as well) to refer to the same scheme.

The NWDA has identified 30 potential river links across the country, which have been categorised under two 'components': the 'Himalayan Component' with 14 links, and the 'Peninsular Component' with 16 links. The entire scheme proposes the construction of 35 dams, along with numerous canals, tunnels, and other ancillary infrastructure (NWDA, n.d.-b). Some links close to international borders will disturb transboundary river systems, and have attracted uneasiness from the neighbouring countries of Nepal and Bangladesh, which will require transnational agreements. The water balance studies used to identify these 30 links have not been released to the public domain, despite multiple requests from civil society organisation and water policy sector experts. Requests for data have either been ignored or refused – citing the secrecy of data for transnational rivers, even when obvious transnational components were missing (NWDA, n.d.-d; Thakkar, 2012; Chundawat, 2021).

The NWDA estimates the total benefits of the ILR project to be "[An increase of] 25 million ha of irrigation from surface waters, 10 million ha by increased use of ground waters, raising the ultimate irrigation potential from 140 million ha to 175 million ha and generation of 34 million KW of power, apart from the incidental benefits of flood control, drought mitigation, navigation, water supply, fisheries, salinity and pollution control etc. *(sic)*" (NWDA, n.d.-a). The detailed studies that were used to calculate these macro-level total benefits *have not been released in the public domain*.

The total costs of the scheme were roughly calculated to be around Rs. 5.60 lakh crore in 2003; however, the NWDA claims that the total costs of the project cannot be predicted without DPRs being prepared for each project. Similarly, the total submergence, loss of habitat, displacement of people, cumulative impacts, and other fallouts of the whole scheme are difficult to predict and rough estimates have not been communicated (NWDA, n.d.-a). Even this predicted price is likely to escalate, not only in line with inflation but also with the well-known telescopic price tags of Indian public infrastructure projects.

Out of the 30 links, DPRs have been prepared for the following nine links, which can be understood as a measure of intent (NWDA, n.d.-b):

- Ken-Betwa Link (earlier Phase-I and II, but have since merged again)

- Par-Tapi-Narmada Link
- Damanganga-Pinjal Link
- Godavari (Inchampalli/Janampet)-Cauvery (Grand Anicut) Link
- Cauvery (Kattalai)-Vagai-Gundar Link
- Kosi-Mechi Link (entirely in Nepal)
- Burhi Gandak-Noon-Baya-Ganga Link (concerns Nepal directly)
- Wainganga (Gosikhurd)-Nalganga (Purna Tapi) Link
- Ponnaiyar-Palar Link

Worth mention is also the Farakka-Sunderbans Link for which the FR has been prepared, which is of concern to Bangladesh due to its potential impact on the Sundarbans delta, and river systems that support much of the agriculture in the country. The Kosi-Mechi Link lies entirely in Nepal, and if pursued, it could be a potential source of international tension for India. The Jogighopa-Tista-Farakka Link is an alternative to the Manas-Sankosh-Tista-Ganga (MSTG) Link, and while the former has been shelved for now, it has not been completely erased from the prospective plan. The Kosi-Mechi Link and the Jogighopa-Tista-Farakka Link are not undergoing an FR study currently. Thus, the number of links being considered is 28, if ongoing studies are used as a qualifier. Further, the FRs for the Sarda-Yamuna Link and the Ghaghara-Yamuna Link have not been circulated since their components have not been studied.

Within the Peninsular Component, four interstate "priority links" have been identified: the Ken-Betwa Link (KBL), the Damanganga-Pinjal Link, the Par-Tapi-Narmada Link, and the Godavari-Cauvery Link. Among these, the KBLP has received the greatest attention and was declared a 'National Project' by the National Democratic Alliance (NDA) government under the current Prime Minister, Narendra Modi. The total cost for the whole ILR project has been quoted as 8.44 lakh crore, much higher than the 2003 estimate (PIB, 2022).

The NWDA takes up projects suggested by State Governments as well. Beyond the 30 interstate links, 47 intrastate links have also been proposed by State Governments to the NWDA out of which DPRs have been prepared for the four abovementioned priority links. Some projects are common between the ILR scheme and state proposed links where there is an inter-basin transfer of water, while other ILR projects have been

combined with the proposals of respective state governments. Thus, the ILR has weaved itself into large state-level projects as well, giving the ILR scheme and the NWDA greater importance and influence over water governance in India.

While the concept of water transfers between river basins has been considered the world over, there has never been serious discussion towards a country-wide interlinking of basins like in India, lending the ILR scheme of the Indian Government a certain obscurity among peers. Considering the enormity of the idea, it is worthwhile to historicise these enormous imaginations of the Indian hydrocracy. A historically—contingent deconstruction of the ILR will thus reduce it from a techno-scientific inevitability to a policy-invention that carries social, political, and economic histories that continue to distort water governance practices in India today.

Historicising the Interlinking of Rivers

The ILR scheme is entrenched in and emerges from the histories and habits of Indian governmentality – the imprint of India's colonial experience, the influence of (Soviet-inspired) modernization through state-sponsored infrastructures, and the post-independence fortunes of Indian political leadership. This section will thus provide context to the origin of and continued fascination with the idea of interlinking in contemporary India.

Colonial History

The British colonial government first introduced large-scale dams and canal irrigation schemes in India with projects on the Godavari in 1852, the Ganga in 1854, and the Krishna in 1855 (D'Souza, 2003). These replaced traditional and local systems of flow control and irrigation, in effect transferring the control of river flows from decentralised, region-specific, and usually temporary systems to centralised, imperial regimes of large and permanent hydraulic interventions (D'Souza, 2014).

The earliest inspiration for the interlinking paradigm in India is cited to be Sir Arthur Cotton, a British military engineer who worked on various hydraulic projects in British India and Egypt (D'Souza, 2003). Arthur Cotton found success in British India through his irrigation schemes on the Krishna, Kaveri, and Godavari rivers. Buoyed with the advent of high finance in the colonies, the transition to the Crown Government in 1858, and his local successes, he suggested 'regulating' the Mahanadi as a measure for flood control in Odisha. Famous for his *Report on the Mahanuddy* [sic]*,* the proposal was a fragment of his ambitious scheme to link all major river systems in India through a network of navigational canals. His scheme was suggested as an alternative to the then-nascent railways, as he believed waterways to be a superior option for transport in British India[1]. Evidently, the railways were chosen over his interlinked waterways, and the idea was forgotten by the Crown Government (D'Souza, 2003; D'Souza, 2008).

1 In support of this vision, portions in his report were dedicated to describing railways as an inferior mode of transport.

Although snubbed by the British Crown Government, Arthur Cotton is remembered fondly in India. His legacy in India is best emphasised by the museum dedicated to him in Rajahmundry, and his statue in Hyderabad – one of the few people from the British Raj memorialised in independent India. His projects are still celebrated by governments in the south, with a celebration for his birth anniversary at Vijayawada in 2018 and calls for observing the same in Tamil Nadu this year – often associated with calls for supporting water engineering projects (Special Correspondent for The Hindu, 2018). His legacy has impacted the imaginations of government engineers, especially in the south, and provides support to contemporary visions of interlinked rivers.

The British colonial government in India had approved plans to build Multipurpose River Valley Development (MPVRD) schemes on the Damodar, Kosi and Mahanadi rivers. The Central Water, Irrigation and Navigation Commission (CWINC), was set up as a professional hydrocracy for studying and implementing MPRVD schemes as part of the colonial administration (D'Souza, 2014). The CWINC was succeeded by the contemporary Central Water Commission (CWC), which oversees river projects today, attached to the MoJS under the Government of India.

Post-Independence Proposals

Centralised planning, industrialisation and technological advance were central to modernization projects that were being pursued in both poles of the world during the Cold War. This enthusiasm for technocratic developmental policies had reverberations within India as well, primed in many ways by colonial ideational and institutional legacies. The enthusiasm toward large hydraulic interventions worked to popularise MPRVD-like schemes in a post-colonial Indian state that was looking for development and prosperity through modernity.

In the 1960s, K.L. Rao, the then Union Minister of State for Power and Irrigation proposed the linking of the Ganga and Kaveri via a 2,640 km long canal. This proposal was then revised into a 'national river grid' under which surplus waters from the Ganga and Brahmaputra would be redirected to central and southern Indian states (D'Souza, 2003). This idea found consonance with Captain Dastur's 'Garland Canal' proposal that

sought to construct a 4,200 km long Himalayan canal and a 9,300 km long southern canal linking up at Delhi and Patna. The Government of India had set up the "National Commission for Integrated Water Resources Development Plan" (NCIWRDP) in 1996 as a High-Powered commission to study these proposals in greater detail. In 1999, the NCIWRDP published a report declaring Rao's project to be "very costly with lower cost alternatives available" and Dastur's proposal as "*prima facie* impractical".

These projects must be seen in context to India's fascination with large-scale infrastructure projects as necessities for a developmental state. Jawaharlal Nehru's (in)famous 'temples of modern India', were seen as obvious technocratic solutions for uplifting India's poor and bringing socio-economic 'development' on a grand scale. Nehru may not have been quite so convinced himself, since he had also criticised India's obsession with large dam projects as a "disease of gigantism" (Roy, 1999). Regardless, dams quickly came to symbolise independent India's potential. The ability to dominate nature had long been enmeshed with imperial narratives of power, and the same imaginations were translocated in post-independence, cast in socialist philosophies of socio-economic equity and justice.

The proposals by Rao and Dastur were manifestations of popular sentiments that looked to harness natural process and put them to work towards specific conceptualisations of national development. Despite being rejected by mainstream academia as unhealthy and destructive, undercurrent ideas of *total* resource exploitation remain motivational to contemporary national developmental paradigms today and continue to influence policy. Such an impulse can be identified in the ILR as well, as will be seen in the following sections.

Rebirth in the 21st Century

The prospect of linking India's rivers found articulation once again in an October 2002 judgement by a Supreme Court bench headed by then-Chief Justice of India, B.N. Kirpal. The bench "suggested" a need to study the interlinking of rivers, as a response to India's "paradox of flood and drought" (Writ Petition (Civil) No. 512 of 2002 "In Re: Networking of Rivers", 2012). The Atal Bihari Vajpayee-led NDA government sprang into action. By November, the government claimed to have completed six FR's for peninsular links, and by December the government set up an "ILR Task Force". Then-Member of Parliament (MP), Suresh Prabhu was given the Cabinet Minister-equivalent chairmanship of the Task Force to plan for the implementation of the project (D'Souza, 2014). This 2002 Task Force was a temporary group, set up for initiating the project, and upon the submission of two Action Plans (aptly named Action Plan I and Action Plan II) was dissolved in 2004.

In 2004, the ruling party changed to the United Progressive Alliance (UPA) under Manmohan Singh. The alliance took the matter of the ILR under their "common minimum programme" and declared that a comprehensive reassessment of the project was necessary. In effect, the UPA relegated the project to the backburner in favour of its own projects (Iyer, 2007). Despite the push by the Vajpayee government in 2002, while the NWDA continued to carry out water balance studies to investigate possible storages, links, and transfers, no formal ILR project was included in the ninth and tenth five-year plans for the period of 1997 to 2007.

In 2009 at Chennai, Rahul Gandhi, commenting in a "personal capacity", questioned the environmental fallout of interlinking projects and cautioned against "playing god with nature". Within a month, the then Union Minister for Environment and Forests, Jairam Ramesh was quoted at a press conference saying, "the interlinking of rivers will be a human-ecological-economic disaster. It is easy to do interlinking on paper. Interlinking of rivers has limited basin value, but large-scale interlinking would be a disaster" (Express News Service, 2009). The UPA officially remained non-committal, with then-Prime Minister Manmohan Singh saying, "[ILR] can help in expanding [the] area under irrigation. But there are … environmental concerns" (PTI, 2009). Manmohan Singh

acknowledged the differences of opinion between experts in the field, stressing on the need to exercise caution while pursuing the project (Deccan Herald, 2009). These statements allow insight into the UPA leadership's approach to the ILR project. Inexplicit ambivalence is often seen in governance as a politically-safe move to bury unwanted projects and forget uncomfortable commitments, without ruffling the wrong feathers. The UPA seems to have been disinterested at best in carrying the ILR project forward.

In 2012, the Supreme Court again revived the ILR project when it disposed two writ petitions, *Writ Petition (Civil) No. 512 of 2002 with Writ Petition (Civil) No. 668 of 2002*, and called for the interlinking project to be taken up by the Central Government. The writ petition was the Court's own creation, stimulated by a combination of elements: a speech by then President late Dr. A.P.J. Abdul Kalam on August 14, 2002, the "prayers" submitted by the *amicus curiae*, Ranjit Kumar, in a different case, and the Justice B.N. Kirpal's suggestions. The 2012 judgement was the final disposal of the 2002 writ petitions, reinforcing the Court's 2002 suggestions with greater force, thus reanimating the colossus of interlinking.

While the Court made explicit the dangers of judicial overreach and the need for an appropriate forum to deliberate upon interlinking projects, it was unequivocal in its support for the concept, going as far as saying, "We would recommend, with all the judicial authority at our command, that these projects are in the national interest, as is the unanimous view of all experts, most State Governments and particularly, the Central Government" (Writ Petition (Civil) No. 512 of 2002 "In Re: Networking of Rivers", 2012). However, within these expert circles, there was and remains vehement opposition and criticism of the project (Iyer, 2012).

The Court asked for the creation of a Special Committee on ILR (SC ILR) chaired by the Minister for Water Resources, to carry out ILR project planning and implementation. The Court conferred structure, powers and responsibilities upon the committee, and called for the implementation of the KBLP at "the first instance itself" since it was the only project for which the DPR had been completed and submitted at the time of the judgement. A *mandamus* was issued for the Central and State governments, making it possible to be held in contempt for failing to follow the judgement.

The special committee is now the primary body that deliberates on interlinking projects and coordinates necessary action. Since 2012, the number of DPRs prepared have increased and various statutory clearances have been awarded to priority projects – especially within the Peninsular Component. The NDA government has pursued interlinking projects with much greater interest than both previous UPA governments, in-part a legacy of Atal Bihari Vajpayee's ILR moment in 2002. The wave of shakeups, rebrandings, and reprioritisations which came with the 2014 NDA government included the resurgence of the ILR question and a renewed interest in a buried idea. In 2015, a new Task Force for the ILR was set up to assist the Court-mandated SC ILR in its functioning. This Task Force was a spiritual successor of the one formed in 2002, with members common between the two. The 2015 Task Force was set up to consider the two Action Plans developed by the 2002 Task Force, and stands today under the NWDA.

The Current Situation

As of 2021, the NDA led by Narendra Modi has significantly increased the Central Government's attention to the possibilities of interlinking Indian rivers. Assisted by same-party governments in Madhya Pradesh and Uttar Pradesh, the Central Government has underlined the importance of the KBLP and shifted focus back to the immediate implementation of the project, under their own flagship irrigation programmes. Election speeches made in Bundelkhand mentioned the KBLP project as a campaign promise to irrigate the region – highlighting the interest of the Bhartiya Janata Party (BJP) in the idea (PMO India YouTube Channel, 2021).

The Indian National Congress (INC) raised concern over the project when it was thrust into the spotlight in March 2021, with Jairam Ramesh tweeting that he had "suggested alternatives 10 years ago", and Party Chairperson Sonia Gandhi writing to the then Union Minister of Environment and Forests and Climate Change, Prakash Javadekar, highlighting the contention of the project (Bhardwaj, 2021; Ramesh, 2021).

Of note is that all of the KBLP's clearances were awarded between 2016 and 2017, despite the FR for the KBL being prepared in 1995 and the first MoU being signed in 2005. Narendra Modi launched the "Jal Shakti Abhiyan: Catch the Rain" on 22 March 2021 and signed a tripartite agreement with the Chief Ministers of Madhya Pradesh and Uttar Pradesh to "herald the beginning of inter-state cooperation to implement the vision of Former Prime Minister Shri Atal Bihari Vajpayee … through the interlinking of rivers". At the event was also announced the intention to set up a special purpose agency – the Ken-Betwa Link Project Authority, for the speedy implementation of the project (PMO India YouTube Channel, 2021).

Since the project was first revealed, there has been significant pushback to the KBLP and the ILR, most often by apprehensive experts from a range of backgrounds. These have included environmentalists, engineers, and ex-government officials who worked in the Ken-Betwa region. Members of the government and expert committees related to the ILR have also spoken out against the idea as well. Today, the criticism is well-documented,

unanswered, and more relevant than ever. The next section looks at the reasons given that justify the KBLP and the ILR more broadly.

Reasons to Interlink

The KBLP is not an isolated hydraulic solution, tailored to the requirements of the Bundelkhand region it claims to supply, but rather only a fragment of a much larger proposal that looks to link all major Indian rivers to one another, to create a superstructure of near-total control over river flows in India. These imaginations follow from the consideration of natural flows as 'inefficient' and 'squandered', not exploited fully, leading to 'dangerous' extremes like floods and droughts. Consequentially, say the proponents, only human intervention can improve the use of this natural bounty to its full potential. Their dream is to maximise the exploitation of India's freshwater resources for its fields, industries, and households; the bastions of economic growth, that would allow India to follow a strong developmental trajectory.

This section describes the broad arguments made by the proponents of interlinking (and large hydraulic intervention in general), many of whom work in the hydrocracy or are former hydrocrats who continue to champion the cause of the ILR post-retirement. Closely associated with these governmental bodies is a network of government research institutes, civil engineering firms, and industrial lobbies that coalesce in support of large hydraulic interventions. This clique considers the ILR to be the inevitable next step in Indian water resource development and pursues it with eagerness far surpassing the ILR's (natural and social) scientific rigour. This section provides narrative context to the ILR project since hydrocratic proposals can often seem like black boxes with government project proposals providing little useful context. Critiques of the government's claims are approached later in this piece.

India's Water Crisis

India's water situation is by no means comforting. Water scarcity and the lack of access to safe water is a lived reality for millions, with surface water stocks being unevenly distributed and groundwater stocks being depleted faster than they can recharge. The situation is complex, with distinct regional challenges, but there is consensus over the impending risks of access to freshwater. Water polluted by untreated effluent, heavy

metals, and solid waste, jeopardises the quality of available freshwater – rendering it unfit for consumption and destroying ecosystems. Climate change intensifies and complicates matters, with increasing glacier melt, unpredictable rainfall, and the numerous specific but not yet fully-known consequences of the many disrupted environmental processes associated with climate change. India's agrarian economy is still largely rainfall-dependent, and these variabilities will lead to immensely challenging socio-economic conditions as a consequence.

To quantify India's water crisis, the hydrocracy employs a macro-scale water balance. India receives an average of 4000 Billion Cubic Meters (BCM) of annual rainfall. A total of 1900 BCM of water (surface water and groundwater) is considered to be India's available resource, of which 1130 BCM can be 'developed' for human use. It is claimed that India currently exploits only 650 BCM of the 1130 BCM available, and the ILR can add up to 300 BCM to this figure. Irrigation uses 78% of the water currently exploited, followed by the domestic sector (6%) and the industrial sector (5%). India's population is still growing and is expected to stabilise around 2050 at 1.5 billion. Projecting water demand to fit the expected growth of the economy and population, a requirement of 1180 BCM is calculated for 2050 (Thatte, 2009). **The hydrocracy still strongly advocates large hydraulic interventions and predicts that even considering improvements in water-use efficiency, India could need 2500 dams in addition to the already existing 4000 to meet projected water demands.**

The Ambition of Economic Growth

Economic growth is the almost-obsessively-stated objective of any government project today. This is especially the case for developmental interventions like dams and canals. The reasons are beyond the scope of this paper, but the 'neoliberal turn' of the 90s was a defining moment in Indian economic history. In broad strokes, the economic narratives of the Indian ruling class were reoriented, and high economic growth became a requirement to uplift the poor and marginalised. The ILR scheme has attempted to justify its existence by claiming economic growth as a vital return to investment.

In 2008, The National Council of Applied Economic Research (NCAER) published an economic impact assessment of the ILR scheme. The study set out to "assess the macro

impact of the ILR programme on Indian economy [...] both at short- as well as long-term *(sic)*". Their scope was limited to "[an] impact assessment study, not a cost benefit analysis". The study also did not look at the environmental fallout of the project, since the 2003 ILR Task Force had commissioned a separate study for the same. Noting the increase in agricultural yield and decrease in rural poverty seen in Punjab and Haryana, the report underlined the importance of irrigation provided by the Bhakra Dam and the associated increase in the cultivation of paddy and wheat. According to calculations *given by the NWDA* to the NCAER, the ILR project could provide irrigation to an additional 30 million ha of agricultural land and a net power generation of 20,000-25,000 MW. **Citing a decline in agricultural growth, increase in water demand, and increasing population – the report said the ILR project is of "utmost importance for the development of the country and it is necessary that a supportive climate for the programme be created". Since modern agricultural technologies are water-intensive, the paper argued that an increase in irrigation is necessary to create agricultural growth.**

The NCAER predicted an overall increase in the economy in terms of value added due to 'forward and backward linkages' of agrarian economy (NCAER, 2008). A total of a 4% increase in employment would be seen due to the benefits of the ILR. The report warned that it only looked at macro effects while region-level consequences of the project were not considered. According to the report, the impact of the ILR scheme would be clear only when "construction is completed, reservoirs filled and the water reaches the ultimate users for irrigation, drinking, industrial purposes and hydropower generation".

The (Presumed) Need to Interlink

The hydrocracy often laments that India suffers the challenge of storage and not supply. The monsoon in India delivers sufficient freshwater, however, the season is concentrated over a few months and regions receive unequal rainfall. There is thus spatial and temporal unevenness in India's water supply. During this season, ephemeral rivers flow, and major rivers are torrential. The water supplied by the monsoon is not stored effectively and come summer, droughts and scarcities are once more commonplace. For proponents of the ILR, herein lies the treasure. If monsoon flows were to be adequately

stored and floodwaters be saved before they flow out to the sea 'unutilised', the stockpile could supply water for the rest of the year and promote irrigation-fed farming practices, less dependent on the seasonal monsoon. To the hydrocracy, variation in temporal and spatial availability of water is an aberration (as opposed to climatological condition) which must be fixed to ensure year-round water supply.

Often referred to as India's "flood-drought paradox", the existence of both droughts and floods at the same time in the country has flummoxed many, and the transfer of water would resolve the situation. In the ILR, water transfers are made possible by impounding floodwaters in reservoirs and diverting this reserve using canals. Water is moved by raising the elevation of the water surface in reservoir and allowing water to flow along gravity through canals and tunnels to the regions facing scarcity. Since storage systems would absorb surplus flows, they would mitigate floods, acting like a buffer for flood-prone regions, levelling out flow variations in the region and securing the region against a deluge.

To ILR proponents, it is concerning that the building of large dams and consequently the growth of India's water storage capacity has slowed down. The ILR will allow the trend to intensify once more and meet water storage requirements. Since interlinking projects will supplement existing infrastructure and provide additional storage capacities, water supply can be enhanced countrywide. Proponents consider this water storage capacity to be necessary for long-term water security which is in turn a requisite for food security in India. Currently 58 BCM of water is transferred between river basins using canals and the hydrocracy (typically the NWDA) often claims that the idea is tested and proven. This claim is tenuous, since the success of these projects is doubtful.

Droughts and flood depreciate livelihoods, displace millions, and risk the lives of thousands if not millions. These could be brought under control since surpluses and deficits could be manipulated to mitigate both kinds of extreme water stresses. Further, unplanned resettlements (displacements) severely affect people, through the loss of productive assets and sources of income, disruption of livelihoods, community, distortion of kinship networks, and changes to cultural identities and traditions. These often lead to

psychological trauma and suffering that spread through entire communities with generational effects. According to interlinking proponents, if resettlement and rehabilitation were to be planned, as it will be in the case of the ILR, then these pressures can be mitigated while ensuring long-term water supply stability.

Beyond improving water availability and mitigating extremities in flow, the interlinking scheme would enhance economic activity, as described by the NCAER report, and improve socio-economic conditions for the impoverished millions. Agriculture employs the poorest in India, largely in rural and peri-urban areas, and those that rely on the rain are the most vulnerable and cannot intensify agricultural activity for increased returns. If supplied with a consistent source of irrigation, the poorest would be able to grow crops with higher market value throughout the year. The hydrocracy represents the ILR to be a shot in the arm for the Indian economy that continues to suffer due to poor water resource management.

The hydrocracy believes that the gigantism of hydraulic intervention is preferable if it is cost-effective, and that it can optimise the use of its stored capacity through efficient and multipurpose use of impounded water stocks. For the hydrocracy, efficient management and effective planning of projects like the ILR can reduce and even eliminate most risks associated with these projects. Be they ecological destruction, the spread of pollutants, the introduction of invasive species, desertification, waterlogging and/or salinization. Where intra-basin solutions are 'impossible', interlinking is proposed as necessary to guarantee access to water for people residing in water scarce regions.

Alternatives like rainwater harvesting, ponds and tanks, and similar smaller-scale solutions aren't sufficient and would require decades to supply as much water as dams and canals. India is *said* to not have the time required by small interventions. **To the hydrocracy, the ILR is an inescapable requirement for India to meet the water requirements of its people** (NCAER, 2008). Economic growth is necessary for improving the situation of the marginalised and is also dependent upon India's water security. Proponents believe that the benefits of dams have been documented sufficiently to justify the requirement of the ILR in India – not only for domestic use and irrigation, but

also for industry and the linkages that would multiply the benefits of properly exploiting India's plentiful (but apparently misused) water resources.

A significant discursive strength of the ILR project, and command-and-control water governance paradigms in general, draws from the "common-sensical" nature of their solutions. Arguments seem parsimonious and neat, with their prescriptions just waiting to be implemented successfully. All that seems to be lacking is political will, national solidarity, or efficient execution. However, this parsimony hides the depoliticization of historical, social, and environmental realities. The propositions of the hydrocracy are derivative and reflect the dominant large-scale, supply-side hydrology paradigm of water governance in India. Economies, societies, and ecosystems are highly complex systems that resist simplistic machinations that seek to control them; and the hydrocracy has consistently rejected necessary complexity in favour of dangerous simplicity. The benefits of hydraulic interventions are not as unproblematically stellar as hydrocrats claim, and the suffering forced upon the most affected is suppressed and rendered unseen.

The KBLP and the ILR are timeworn ideas. They are still just dams, canals, tunnels, powerhouses, and associated sundries that have been excessively deployed in India for decades. The failures of the dominant paradigm are immanent to the ILR as well. Before detailing these failures, the next section looks at the KBLP proposal individually – its designs and propositions, for specific critiques that contribute to the later discussion around the overall failures of the ILR scheme and the hydrocracy.

The Ken-Betwa Solution

The KBLP is a river linking project under the Peninsular Component of the ILR scheme, which seeks to link the Ken and Betwa rivers in central India. Both these rivers are tributaries of the Yamuna, and meet the Yamuna at independent points along the Yamuna's course. Based on their water balance studies, the NWDA has categorised Ken as a 'water surplus' basin and Betwa as a 'water deficit' basin. As a consequence, water must be transferred from the Ken to the Betwa for the benefit of the regions supplied by the Betwa, especially in the Lower Betwa region[2]. Along with the Parbati-Kalisindh-Chambal link, the KBLP forms the third subdivision of the Peninsular Component which aims to link the Ken to the Chambal by stringing together multiple river links.

The KBLP is an interstate link between Madhya Pradesh and Uttar Pradesh, and thus requires 'consensus-building' between the two State Governments to reach an agreement water sharing, cost sharing, maintenance, management, and various other aspects of the project. Various MoUs and MoAs have been signed over time, with the most recent being that of March 2021 (PMO India YouTube Channel, 2021; Press Information Bureau, 2021). The first MoU was signed in March 2005, 10 years after the initial FR was circulated in 1995, under which the two states agreed to allow for the preparation of a DPR and assist the NWDA in studying the region.

The project was split into two phases in 2010 to "expedite the implementation of the project" and DPRs were prepared separately for both phases. The project was divided into Phase-I – dealing with the transfer of water from the Ken to the Betwa, and Phase-II – dealing with additional infrastructure projects in the Betwa Basin including existing structures and building additional reservoirs and irrigation canals.

Phase-I of the project has been awarded most necessary statutory clearances, requiring only the second stage of Forest Clearance. Two separate forest clearances are required, since the majority of the project is within a protected forest area while some part is

[2] Area of the Betwa basin falling below the Rajghat Dam up to its confluence with the Yamuna excluding the sub-basin areas of Jamni, Dhasan & Bina (NWDA, 2018).

planned within non-protected forest area. The latter has been approved, and the former has cleared Stage-I, awaiting final approval[3],.

Phase-I is located in the districts of Chattarpur and Panna in Madhya Pradesh with canals running through the districts of Banda, Jhansi, Lalitpur, and Mahoba in Uttar Pradesh. Phase-I of the KBLP involves the construction of:

1. The Daudhan Dam: A 2031 m long, 77 m high composite dam with a Full Reservoir Level (FRL) of 288 m to be built upstream of the existing Gangau Weir, near the village of Daudhan, across the Ken River
2. The link canal: A 219 km long canal connecting the Ken to a tributary of the Betwa which will carry water to the Betwa River,
3. Two powerhouses (PH I and PH II) for hydroelectricity generation, with a total power generation of 78 MW (60 + 18 MW),
4. Two tunnels, the 'upper-level tunnel' and 'lower-level tunnel', both on the left flank of the Daudhan reservoir. The former will transfer water to the linking canal and the latter will take water to the second power station (PH II),

The KBLP (Phase-II) previously included the construction of:

1. The Lower Orr Dam: A 2218 m long, 45 m high composite dam with a Full Reservoir Level (FRL) of 380 m to be built near the village of Didauni, across the Orr River,
2. The Kotha barrage: A 13.50 m high, 576 m long barrage across the Betwa River with a pond level of 396 m, near the village of Kotha,
3. The Neemkheda Barrage: A 10.65 m, 200 m long barrage across the Betwa River with a pond level of 426 m, near the village of Neemkheda, and
4. The Barari and Kesari barrages, also built on the Betwa River

Upon discussion with the Madhya Pradesh Government, the Bina Complex Multipurpose Project proposal under the state government was incorporated into the Phase-II proposal of the NWDA. Phase-I is intended to provide the Upper basin of the Betwa with the

[3]Referred to as an 'in-principle clearance'.

water necessary to carry out the projects under Phase-II since multiple projects in the Lower Betwa Basin are currently unfeasible due to insufficient water flow.

After the project was split into two phases in 2010, it was joined once again into a single project in 2017. It was decided that a 'Comprehensive DPR' for the KBLP would be prepared, which would incorporate the sum of the proposals under Phase-I, the modified Phase-II, and additional projects suggested by the Governments of Madhya Pradesh and Uttar Pradesh.

Thus, under this Comprehensive DPR, the KBLP now includes:

1. The Phase-I project, as described above,
2. The Lower Orr Project, as described above,
3. The Kotha Barrage, as described above,
4. The Bina Complex Multipurpose Project: incorporating four sub-projects which are:
    i. The Madia Dam & the Chakarpur Dam on the Bina River,
    ii. The Semra Ghat Diversion Dam on the Dhasan River, and
    iii. The Dehra Dam on the Dehra Nalla,
5. A pressurized pipe micro irrigation system in the command area in Madhya Pradesh, to increase the Culturable Command Area (CCA) of the KBL from 2.87 lakh ha to 4.47 lakh ha.
6. The repair of the Bariyapur Pick Up Weir, Parichha Weir, Barwa Sagar Dam and their related structures on the Ken in Uttar Pradesh, and
7. Multiple pump houses and pumping systems, to supply irrigation systems across project subunits.

The timeline is slightly confusing, but it seems that Phase-II of the project was altered multiple times after its DPR was created, because of which a *third* 'Comprehensive DPR' of all the sub-projects included in the KBLP and new projects suggested by the MP and UP state governments was necessary. Both phases of the project were to proceed together and a combined DPR for the project was created. **The definitive document for details on the KBLP is considered to be the Comprehensive DPR since it is the most**

recent document. All the details of the project quoted in this report are taken from the Comprehensive DPR.

The clearances already awarded to the sub-components under the comprehensive project remain, but due to changes in project aspects, additional clearance requirements have been created. The new projects included under the comprehensive KBLP (Lower Orr Project and Kotha Barrage) have also not been cleared by any authority, and whether their clearance will be pursued in unclear. Thus, the Comprehensive DPR consists of a combination of different sub-projects, all at different stages of the clearance process.

According to a study conducted by the National Institute for Hydrology (NIH) Roorkee for the NWDA, 1401 Million Cubic Metres (MCM) of water is to be transferred from the Ken to the Betwa. It is unclear what the surplus is, since the earlier DPR for Phase-I of the KBLP, which has been considered for the Comprehensive report as well, mentions a transfer of 1074 MCM. There is 6590 MCM of 75% dependable water yield available at the Daudhan site, of this 628 MCM of water is planned to be released as environmental flow (493 MCM) and spill (135 MCM) (NWDA, 2018).

Already existing projects are said to have been integrated into the KBLP design plan, to create a stacking effect wherein the value addition from each project will increase due to the transfer of water. The NWDA further predicts previously unfeasible projects at Barari, Kesari, and Makodia along the Betwa would become possible due to the transfer of water to the Betwa. These interventions will increase drinking water supply, irrigation, and "benefit people in general" based on the NWDA's report (NWDA, 2015a).

The NWDA submits the benefits of the KBLP to be the following:

1. An increase in the annual irrigation for an area of 9.04 lakh ha, with 6.53 lakh ha area in Madhya Pradesh and 2.51 lakh ha in Uttar Pradesh.
2. The supply of 228.9 MCM of drinking water to Madhya Pradesh (161.9 MCM) and Uttar Pradesh (67 MCM).
3. Hydroelectricity generation – contingent on the reservoir level through the year. While the KBLP is described as a primarily "irrigation and drinking water scheme" hydropower production is also included. However, a total of 196.714 MW of

power will be required for the proposed lift and piped irrigation schemes (79.18 MW for irrigation in Madhya Pradesh, 12.97 MW for irrigation in Uttar Pradesh, 10.2 MW for the link canal, and 94.36 MW for lift systems at Panna and Hatta). It is worth noting that on the whole, the electricity consumed by the KBLP outweighs the electricity generated.

4. The supplementary benefits of "employment generation, industrial development, infrastructure development, and [the improvement of the] socio-economic condition of people in [the] project area".

The NWDA claims that the project will greatly improve the conditions of the "water-starved Bundelkhand region" by providing the Betwa 'excess' water from the Ken. The expenditure for the entire project (Phase-I + Lower Orr Project + Kotha Barrage Project + Bina Complex Multipurpose Project) was calculated to be Rs. 35,111.24 crore (Rs. 27,018.49 crore + Rs. 3065.14 crore + Rs. 708.73 crore + Rs. 4142.88 crore), at 2017-18 prices with an estimated construction period of 8 years.

The most strikingly controversial aspect of the project is the construction of the Daudhan dam and the two powerhouses within the core area of the Panna Tiger Reserve (PTR). The submergence area of the dam is estimated to be a total of 9103 ha, out of which 5802 ha falls within the PTR. Outside the reserve, a further 1117 ha of forest area would also submerge. The hydroelectric powerhouses are expected to greatly disturb wildlife in the reserve according to reports by the National Board for Wildlife (NBWL) and Forest Advisory Committee (FAC). The six to ten years of intense construction activity will also disturb the Tiger Reserve and have lasting impacts according to the reports of both committees (CEC Report No. 23 of 2019, 2019).

The NWDA expects the submergence of the Dam to destroy 10 villages and displace 1585 families, amounting to 8339 people, of which 49.52% fall within the SC/ST category and a further 38.4% of are categorised as Backward Castes (BC) (NWDA, 2018). The "user agency" (referring to the authority responsible for the project) is required to describe an appropriate resettlement and rehabilitation plan for those displaced, but India's history with resettling displaced persons has been dismal, and even well-formed rehabilitation plans are circumspect. This aspect is treated at length later in this report.

Phase-I of the KBLP received its Wildlife Clearance based on the recommendation of the Standing Committee of the NBWL (SC NBWL) on 23 August 2016. A petition challenging the Wildlife Clearance was filed with the Supreme Court on 23 February 2017 and the Central Empowered Commission (CEC) of the Court flagged the clearance in an order on 30 August 2019. The Court observed "wide divergence in the observations made by the Committee constituted by the SC NBWL and the recommendations on mitigative measures ultimately made by the SC NBWL *(sic)*". The project now requires clearance from the CEC to move any further. **While the CEC did not condemn the ILR as a concept itself, it underlined contentions that are common to all ILR projects** (CEC Report No. 23 of 2019, 2019).

The Expert Appraisal Committee (EAC) awarded the Environmental Clearance to Phase-I of the KBLP on 25 August 2017. Following this, an appeal was filed in the National Green Tribunal (NGT) challenging the clearance. The appeal was admitted, and although a requested stay on the project was rejected, the NGT declared that equity could not be claimed for work during the pendency of the application. The matter is still pending with the NGT (Himanshu Thakkar vs. Union of India and others, 2017).

The KBLP has thus faced severe scepticism and critique based on project design, the environmental assessments, the legitimacy of the awarded clearances, the necessity of the project, and the lack of alternatives considered. The following section covers the criticisms of the KBLP, first covering its faults from within statutory and governmental requirements, and then criticisms of the project from sociological and scientific perspectives.

The Ken-Betwa Delusion

This section will look at criticisms of the KBLP, many of which are also relevant to fundamental issues with the ILR as a whole. The KBLP is somewhat of a litmus test for the Central Government to prove the viability of interlinking projects and drum-up popular support for the scheme. The perceived optics of a project are central to analysing government schemes, since sentiments surrounding them matter greatly to elected members of government. These considerations can influence project proponents to communicate idealistic representations that are misleading and disingenuous. In the case of a mega-project like the KBLP, these factors are only amplified. To cut through the rhetoric, external critiques are vital to encourage healthy public discourse, complicating linear and dominant narratives, and decentring perspectives, thus allowing for more democratic outcomes.

The ecological fallout of the KBLP, especially in the PTR is the most striking issue with the project. Further, the economic and social costs of the project along with the lacklustre nature of its proposed benefits are also criticised. The KBLP suffers procedural issues and lacunae as well, in violation of government frameworks and guidelines. These include: a deficient DPR, a poor Environmental Impact Assessment (EIA) report, a lack of required public data provision, and the questionable legitimacy of the clearances awarded, among other procedural concerns.

The discussion here is limited to projects under Phase-I of the KBLP, since almost all the clearances required by the KBLP have been awarded to Phase-I, and these clearances have also faced the greatest judicial scrutiny. Phase-I is also the only project component for which an EIA has been distributed publicly. Documentation for Phase-I has existed in the public domain for the longest time, and has thus been subjected to the most extensive critique. The procedural faults indicated here thus highlight the lack of rigorous consideration given to large-scale government resource engineering projects, speaking to a failing system of regulative checks and balances.

While the procedural issues of the KBLP are specific to the project, they point to a fundamentally-flawed project philosophy and institutional ailments of the Indian hydrocracy. It is necessary to correct the possible tendency of overlooking the flaws of interlinking, in favour of correcting the absurdities of the KBLP through potential re-evaluations, while still considering the ILR to be a feasible pursuit. It is essential to bear in mind the 60 or so other water transfer projects floating around in government offices, similar to the KBLP in their design philosophy. Consequentially, an important disclaimer must be made to connect issues characteristic to the KBLP and issues fundamental to interlinking. **Modifying the KBLP and resolving its (procedural) blunders will not be enough to justify the ILR** is essential to consider before contending with the KBLP.

Procedural violations are commonplace in Indian water governance, and there exists a pattern of ignorance, inadequacy, and oversight within the hydrocracy. Despite the constant presence of activists, academics, and other members of civil society, problematic projects move ahead without properly acknowledging rightful critique. At times of heightened public scrutiny, patchwork compromises are negotiated that attempt to conserve as much of the original project as possible. This unquestionable faultlessness is the standard mode of the hydrocracy and leaves little room for healthy disagreement and regulation.

Faults and Deficiencies in Statutory Processes

The KBLP suffers from many project-specific issues, which have developed over its long-winded history. These issues are critical for the rest of the KBLP and the ILR project as a whole, since they are manifestations of long-standing problems within Indian water governance and will set a precedent for future river-linking projects. In view of the flagship-like status given to the KBLP within the ILR scheme, the quality and legitimacy of how it has been approached are of immediate interest. To deliver a comprehensive critique of the KBLP and the ILR, it is vital to consider the procedural faults of the KBLP not as unfortunate incidents that can be corrected, but as inevitable outcomes of systemic institutional failures. Major procedural faults have thus included:

1. **The 'Terms of Reference' (TOR) set by the EAC at meetings in 2007 and 2010 for the EIA of the project were violated in the preparation of the EIA report.** The TOR

required the project to receive its Wildlife Clearance from the SC NBWL before approaching the people affected by the project for mandatory Public Hearings. However, hearings were conducted at Silon in Chattarpur, and Hinouta in Panna on 23 December 2014 and 27 December 2014, respectively, while the SC NBWL clearance was received only in August 2016 (Himanshu Thakkar vs. Union of India and others, 2017).

According to a September 2006 Ministry of Environment and Forests (MoEF) notification, the EIA report must be uploaded to the relevant Pollution Control Board's website at least a month before the hearing process. The EIA report for the KBLP (Phase-I) was uploaded to the Madhya Pradesh Pollution Control Board (MPPCB) website on December 27, 2014, four days after the hearing in Silon and on the day of the hearing in Hinouta. Moreover, the EIA report that was made available to the Sarpanch of Hinouta was only in English – which none of the villagers could read. Even this inaccessible copy provided did not contain the very TOR it was violating within its annexures (Pallavi, 2014).

Public Hearings were only conducted in Panna and Chattarpur, while the districts of Tikamgarh in Madhya Pradesh and Banda, Mahoba and Jhansi in Uttar Pradesh, all of which will face downstream impacts of the project, were left out of the public consultation process. These faults resulted in inadequate Public Hearings since only a fraction of the people affected by the project were considered. The attendees at the hearings were either not given the EIA report or were given an incomplete EIA in a language they could not read, and sufficient time to understand the EIA report was not given as per MoEF's 2006 guidelines. There were also reports by activists present at the meetings of troublemakers at the hearing process in Silon and Hinouta, who were brought under control in Silon but severely disrupted the process at Hinouta (Pallavi, 2014).

Despite such violations of the Public Hearing process being a common occurrence in the preparation of EIA reports in general, the Ministry for Environment Forests and Climate Change (MoEFCC) (the ministry that succeeded the MoEF) has *never* ordered a fresh Public Hearing or rejected a project based on an incomplete Public Hearing process (Thakkar, 2019).

2. **The recommendations of government clearance authorities were ignored by the NWDA.** The SC NBWL had attached a condition of establishing any power generation infrastructure outside the PTR, in the Wildlife Clearance it had awarded on 23 August 2016. These conditions were agreed upon by the NWDA in saying that 'all the power generating facilities shall be established outside the [Tiger Reserve]'. The same requirement was also put forward by the FAC on 25 May 2017, when it awarded the KBLP (Phase-I) a Stage-I 'in-principle' Forest Clearance. However, the powerhouses (PH-I and PH-II) are still within the PTR as per the Phase-I DPR – submitted to the EAC, and the Comprehensive DPR. Despite the conditions of the NBWL and FAC not being met by the NWDA, the project was awarded an Environmental Clearance on 25 August 2017 by the EAC.
3. Some **requirements of the 'Model TOR' for EIAs set by the MoEFCC concerning hydrology and topography studies were not followed.** Even among requirements that were met, many suffered unscientific and substandard analyses. Relevant surveys and studies that analyse the region of interest are necessary for ensuring a complete understanding of the project in line with contemporary realities and current science (Himanshu Thakkar vs. Union of India and others, 2017).
4. **The history of the EAC responsible for clearing Phase-I is problematic.** The committee was reconstituted in 2016 and held its first meeting on 30 December 2016. In four meetings between 2015 and 2016, the previous EAC had refused to clear the project due to unresolved issues. These included discussions about the inclusion of a 'Landscape Management Plan (LMP)' within the EIA, the reduction of the Daudhan Dam's FRL by 10 m, and the removal of the powerhouses from Phase-I (as suggested by the SC NBWL and FAC).

   The post-2016 EAC set the required LMP outside the EIA's scope, and overlooked all other discussions. This EAC then recommended the KBLP (Phase-I) for an Environmental Clearance.
5. **A major flaw with the post-2016 EAC was a conflict of interest with the Chairmanship of the committee.** Dr. Sharad Jain was appointed as the Chairman of the EAC in 2016 and was then also appointed as the Director General of the NWDA on March 29, 2017. He subsequently stepped down from his post at the NWDA, not before a significant overlap between these two appointments. Considering that the

EAC is a clearance authority meant to scrutinise projects from various organisations, its independence from project proponents is central to its effective functioning (Himanshu Thakkar vs. Union of India and others, 2017; Pallavi, 2014).

It is worth noting that the Chairman two terms before Dr. Sharad Jain's, Dr. P Abraham, was also criticised for a conflict of interest, as he was on boards for private hydropower companies during his tenure. The EAC is notorious for problematic functioning and has habitually ignored or rejected the submissions of other government committees, institutes and environmentalists (Thakkar, 2019).

These procedural violations are representative of the lack of rigour present throughout the fundamental documents of the KBLP, in the FR, DPR and EIA reports. The EIA is a crucial document, prepared to ensure transparent and ecologically-responsible project design and implementation. The document guides the EAC while scrutinising the environmental appropriateness of a project. A blatantly inconsistent, inaccurate, and unscientific EIA report is a cause for concern. A direct consequence of a poorly conducted EIA is the creation of knowledge gaps between project design and ground reality. This leads to an incomplete comprehension of the potential risks of the project and leaves room for biased interpretation, resulting in insufficient scrutiny while awarding clearances. While it is expected that a deficient EIA would be junked by a self-respecting EAC, this option was never considered.

The agency responsible for preparing the EIA for the KBLP (Phase-I) is AFC India Limited, earlier registered as the Agricultural Finance Corporation Limited. It is a "deemed government company", owned by a collection of development finance institutions, public sector banks, private sector banks, foreign banks, and state co-operative banks. These include, the National Bank for Agriculture and Rural Development (NABARD), the India Export Import Bank (India EXIM Bank) and the State Bank of India (SBI). The major shareholders of the group are thus split between public and private financial firms, giving AFC a quasi-governmental status since its inception in 1968 by the then Deputy Prime Minister and Finance Minister of India, Morarji Desai (AFC India Ltd., n.d.). AFC has no expertise in conducting environmental assessments, which is apparent while looking at their reports.

AFC has prepared EIAs for many other government projects, including the Polavaram Multipurpose Project (under the ILR scheme), the Tipaimukh project in Manipur, the Kameng hydropower project in Arunachal Pradesh and the Thoubal irrigation project in Manipur. It is pertinent to mention that the EIA of Phase-I had undergone a revision in 2015, after its first draft was released in 2011, yet it remains highly unscientific, containing multiple errors, inconsistencies, and almost-pseudoscientific claims. AFC has a history of publishing such reports and has invited harsh criticism over the quality of their reports, even from government agencies (AFC India Ltd., n.d.; AFC India Ltd., n.d.; Thakkar, 2014).

Considering their record, AFC doesn't seem qualified to conduct environmental assessments, let alone for a project as intricate as the KBLP. At the very least, an unbiased assessment of AFC's practices is necessary to investigate the bias and unscientific nature of their reports, and the reports they have submitted in the past need to be reviewed appropriately. The specific failings in the DPR and the EIA of the KBLP (Phase-I) are looked at in detail next, to highlight some of the most troubling claims made by the NWDA, and the failures of the EIA to act as a rigorous and balanced document for effective decision-making.

Misrepresentation and Pseudoscience in Project Documents

The DPR and EIA of the KBLP (Phase-I) propagate several unscientific claims and attempt to obscure the destructive aspects of the project. The FR created in 1995 left significant gaps in its initial analyses which were meant to be filled in within the DPR and EIA. Rather they ended up disregarding scientific realities and misrepresenting environmental impacts. In decreasing order of statutorily-required analytical depth, this section will look at the EIA first, followed by the DPR and then briefly mention the FR.

The EIA makes highly unusual claims and casts doubt on AFCs basic understanding of ecology, geology, and related natural processes. The most untenable claims are given below:

- **The report suggests that despite the creation of a 77 m high obstruction to the movement of aquatic biota, their ability to traverse natural formations**

like the 38 m high Raneh Falls will allow them to move across the Daudhan Dam as well (CIFRI, 2015). This claim has no scientific basis. Waterfalls are in open, continuous flow and have natural flow routes that bypass them, allowing fish to move upstream, along the river. Dams are meant to impound stagnant water, and ecological flows are bound to be disrupted. There is no mention of mechanisms that would allow the fish to move across the Daudhan Dam.

- **The report claims that the creation of the link will assist the migration of fish** by reducing the distance between the Ken and the Yamuna. It goes further to say that '[the] formation of reservoir, creation of irrigation facilities and changes in cropping pattern are likely to favour aquatic communities including fisheries *(sic)*'. This is again unscientific and the EIA submits no evidence to support these claims. If "fisheries" refer to commercial pisciculture, then these cannot be considered a part of natural freshwater ecosystems, and natural systems are disrupted by such changes.
- **Another unsubstantiated claim is that the Daudhan reservoir will lead to the formation of a "more secure and compact habitat" on the right bank of the Ken** due to the protection provided by the reservoir from "encroachments of the park and invasion by livestock". Compact habitats are not favourable for wildlife, especially large predators like tigers, and the sudden disruptions to habitat size cannot be considered secure. The EIA, again, submits no basis for these claims while the NBWL has mentioned the negative impacts of the KBLP on the PTR and the Ken ecosystem. Such equivalences created between the damage caused by the project and the "beneficial" changes to the ecosystem don't hold up to any scientific scrutiny, including that of the government.
- The report has **only considered the loss of tigers** from the habitat **while ignoring the collective loss and degradation of all biogeophysical components of the Ken ecosystem.** The biota of the region has co-evolved over millions of years with the complex canyons and gorges present, to create a unique habitat in and around the Ken. The report has no mention of the widespread disruption to the ecosystem of the region and focuses solely on tiger population management. The dam will submerge multiple delicate geological sites, all of which are crucial for the Ken ecosystem, and cannot be compensated.

- **The EIA suggests that the sedimentation of silt due to the Daudhan dam will be beneficial since the water will flow 'clear' downstream to the reservoir.** It further states that since pollutants will settle out, the water will improve in quality. The suggestion is dangerous, considering that the natural silt flows of a river are important for maintaining the balance and health of a riverine ecosystem. The silt carried by the river plays a role in ecosystems where the flow is either slow and silt is deposited, or it is fast and fluvial minerals are introduced through weathering. Pollution mitigation cannot be achieved by merely stopping the flow of a river since a river is more complex than a channel for water flow.
- **Observations about the ecological importance of the region made by the SC NBWL and the FAC were ignored, despite both bodies awarding clearances to the project based on those observations**. Consequentially, the mitigation measures suggested as part of the EIA are seriously inadequate – assuming one believes the project to be reasonable.
- **Environmental flow assessment is missing from the EIA,** despite the SC NBWL and the FAC asking for the full flow of water to be maintained during the lean season to sustain the Ken Gharial sanctuary, downstream of the Daudhan Dam. Environmental flows as defined in a March 2015 report by the MoEFCC include variable flow regimes including low flows, high flows and flooding. The EIA mentioned the 2015 principles, yet failed to study them.
- **Downstream and cumulative assessments are missing from the EIA report.** Since Ken and Betwa have many existing projects built on them, a cumulative assessment is necessary but was not conducted. The requirement of studying the impact of the project downstream in the Banda district was also ignored. Further, an assessment of the project's backwater impact was overlooked – rendering even the hydrological analysis of the Daudhan Dam reservoir itself incomplete (NWDA, 2015a; NWDA, 2015b; Himanshu Thakkar vs. Union of India and others, 2017)

The EIA is required to study the social and environmental consequences of a project, informing the laypeople of expert opinions. It is thus meant to be unbiased, scientific, and thorough, looking at the project in the larger context of the ecological and social realities. One would naturally expect differences between government agency reports

and an unbiased third-party EIA, but AFC's EIA agrees with the NWDA's DPR on nearly every aspect. Even the observations made by the NBWL and the FAC towards the risks of the project were not considered in the EIA.

The EIA lacks thoroughness in nearly every claim made. There are multiple instances of claims being stated without proof or explanation, as highlighted above. The issues of the Phase-I DPR that were criticised by the CEC in 2019 were reproduced in the EIA, and then cleared by the EAC. While the EIA is a detailed environmental assessment of the project, the DPR is required to study all the fundamental aspects of the project proposal. Thought mostly from an engineering point of view, the DPR does include an initial socio-economic and environmental assessment. The DPR includes project design, hydrology, resettlement and rehabilitation plans, cost-benefit analysis, and a limited environmental assessment.

The faults within the DPR of the project, as submitted to the CEC in 2017 and adjudged by the CEC in 2019 are relevant to assessing the appropriateness of the project. **The most alarming faults of the EIA were present in the DPR as well, as pointed out by the CEC in 2019.** These are as follows:

- **The latest studies conducted for water availability in the Ken Basin are more than a decade old.** Further, among all the studies, there are wide variations in the calculation of water availability. This casts doubt over the quantum of water even available at the Daudhan site and the feasibility of water transfer to the Betwa.
- **The catchment areas of both the Ken and Betwa only receive 900 mm of average annual rainfall, further casting doubt on the availability of 'surplus' water in the Upper Ken Basin.** The transfer of available water from the Upper Ken Basin will severely harm the farmers depending on the Ken, and result in an imbalanced movement from an area already in need of irrigation.
- The CEC observed that **the Upper Betwa Basin has already been heavily altered for supplying water to the Lower Betwa Basin** and the transfer of water from the Ken to the Betwa is not a feasible way of rectifying the loss incurred by the Upper Betwa region. It is ironic that the solution proposed for alleviating the

shortage in the Upper Betwa is a product of the same project philosophy that deprived the region in the first place.

- **The net increase in the irrigated area according to the CEC will only be 0.38 lakh ha out of the reported 2.52 lakh ha that will be supplied** by the KBLP (Phase-I) in Uttar Pradesh since the remaining 2.14 lakh ha is already supplied through other irrigation projects. Similarly, the state of Madhya Pradesh has yet to fully realise the potential of the Ken, thus putting further strain on the fundamental basis and beneficial claims of the project.

According to the DPR, Three Wildlife Sanctuaries (WLS) would be integrated into the PTR to compensate for the lost tiger habitat. There were Nauradehi WLS, Rani Durgawati WLS, and Ranipur WLS. These were deemed unsuitable for sustaining Tiger populations since they are separated by large distances, are too small area-wise, and lack the necessary biological diversity to support a Tiger population (CEC Report No. 23 of 2019, 2019). Even within the insufficient Environmental Management Plan (EMP) of the DPR that only looks to manage Tiger populations, the destruction of the PTR will not be replaceable because of the inadequate substitutes suggested. These inadequate suggestions were reproduced in the EIA, without further scrutiny despite the CEC's objections. In addition, it is suggested that the Chattarpur Division and the South Panna Division be included in the buffer region of the PTR. However, **the fragmentation of the PTR because of the proposed Daudhan Dam would render the Chattarpur Division buffer zone purposeless.**

The most startling omission of the whole project is the absence of any study looking into alternatives for the regions considered. The 'alternatives assessment' of the EIA only looks at alternative locations for the Daudhan Dam, but does not look at any lower-cost, smaller scale alternatives outside the proposed linking project. There is no analysis of alternative systems that could mitigate water scarcity in the region and the EIA concludes that the KBLP 'is required to be implemented' *(sic)* since a 'no project alternative' would prolong water scarcity in the region. This is a reproduction of the 'alternatives assessment' as given in the DPR, which also only compares the project to a 'no project alternative'. **In other words, the DPR and the EIA only looked at two options: implementing Phase-I or doing nothing.**

The NWDA has since its inception been responsible for studying interlinking projects in the country but never studied alternatives for the regions of their interest. The fact that alternatives have not been considered is alarming considering the colossal requirements of the project and the permanence of these interventions once built. This is not a fault specific only to the KBLP's DPR or EIA and is rather a reflection of the quality of proposals submitted by the Indian hydrocracy.

Multiple other disconcerting faults regarding project specifics were found in the DPR and the EIA of the KBLP (Phase-I). These were described by the applicant to the CEC in 2017, the appellant to the NGT in 2018, and the CEC in 2019; however these are not included here for the sake of brevity. The appeal in the NGT is still pending and the final say of the Court is unknown. Notwithstanding, the miserable quality of the DPR and the EIA are disquieting and raise questions about the validity of project design and environmental assessment.

The EIA report reads less like an unbiased and scientific environmental impact assessment of the proposal and more a justification for the project proposal – there is no significant divergence between the narratives of the NWDA and AFC despite pertinent doubts being raised from all corners. The overall quality of the EIA is thus extremely poor, unbecoming of the standards necessary to scientifically study ecosystems and ecologies. While the EIA concedes that 'Inter-river-linking is a complex issue which comprises a matrix of ecological, socioeconomic and cultural aspects (*sic*)', AFC demonstrates a shallow comprehension of this complexity in practice.

Keeping with the trend, **the FR of the project suffers from the same issues as the DPR and the EIA:** a lack of explanation as to the necessity of the project, the lack of sufficient data to ascertain water availability and the absence of acknowledging possible alternatives. **The inadequacy and unscientific nature of all crucial project studies and documents are disturbing.** Regulatory institutions like the EAC, FAC and NBWL are responsible for safeguarding environmental and ecological interests through appropriate scrutiny, but have instead developed a strong approval bias in their functioning. An urgent look into these structural biases is required to ensure the transparent and ethical

implementation of projects, not swayed by political commitments, but rather by democratic and scientifically-conscious decision-making (Thakkar, 2019).

Even the basic necessity of the mega project has not been justified since alternatives were not exhausted or even studied. The water balance studies that described countrywide 'surpluses' and 'deficits' are outdated and remain unavailable to the public. Opaque decision-making has been a mainstay of the ILR project process, making open and informative debate near-impossible (People's Science Institute, 2007). The issues pointed out above pose central questions of the ILR scheme that remain unanswered. The problems highlighted here around project design, planning, and clearance are not unique, being a mainstay of the Indian hydrocracy for decades. These are included here to bring into irrefutable focus the unscientific approach and the hydrocracy's reliance on inadequate templates that attempt to justify project rationale.

It is disturbing that any conscientious analysis of the KBLP highlights flagrant inconsistencies, inaccuracies, and illegitimacy of the process. Interrogations beyond these procedural issues have given more complete critiques of the project, and have been touched upon below.

Fundamental Issues with the KBLP

Fundamentally, the notion of a 'surplus' and 'deficit' is fraught with problematic notions of an anthropocentric ordering of the world. Ecosystems have their particular ecologies, which are necessary for human and non-human well-being. This also includes areas often vilified, like deserts, swamps and grasslands – that are labelled 'wastelands', seen as 'inefficient' and slated for anthropogenic modification. The idea of exclusive 'utility' of an ecosystem for human well-being is in itself ruinous and denies agency to non-human components of the biosphere.

The project is also oblivious to the steady intensification of climate change. The project is meant to last a hundred years but there is no mention, let alone an in-depth analysis of the possible effects of climate change. With rapidly shifting biogeophysical realities, outdated notions of hydraulic interventions run into even greater complications of climate change that require thorough consideration, which were absent in the KBLP.

Climate change is not a problem of the future, which the hydrocracy would claim their projects are needed for, but is a current reality that is in-part a consequence of callous environmental governance.

In a study published by the People's Science Institute (PSI), their ground-truthing analysis of the KBLP found multiple discrepancies between the perceptions communicated by the NWDA and scientific reality. Even though the study was conducted in 2007, and the DPR for the KBLP was changed in 2017, nearly all of their observations still hold true, since the changed DPR reflected the same inaccuracies (People's Science Institute, 2007).

The KBLP seems counter-intuitive even at first glance. The Ken is a minor river and dries up during the summer, longer if monsoon has been scarce, while the Betwa is a much larger, perennial river. This is further evidenced by the water scarcity faced by residents of villages in the Ken Basin, like Daudhan. Experts on the Bundelkhand region, from various experiences, have drawn attention to this impracticality of the KBLP**. The most basic contention, brought out by many including the PSI, is whether the Ken Basin has a 'surplus' to transfer in the first place.** Setting aside the necessity of ecological variabilities and the micro-ecosystems within a larger region, the Ken area is less socio-economically prosperous than the Upper Betwa region. The two regions face similar situations of either water excess or scarcity throughout the year. The contemporary situation of the Ken region is not that of a water-surplus basin and continues to face water scarcities of its own. **Dr. Brij Gopal,** an ex-professor of Environmental Sciences at Jawaharlal Nehru University (JNU) and an expert on the Bundelkhand region, **criticised the NWDA for relying on their modelling studies without ground-truthing their claims.** He questioned the idea of a 'surplus' in the Ken region based on the regular drinking water scarcity during the summer months (Gopal & Marothia, 2016).

PSI compared data between the Ken and Betwa regions to account for any differences in rainfall and potential surface runoff, but found that both basins have an equivalent distribution of rainfall and potential surface runoff, and experience the same variations over time. Thus**, both the basins experience either shortfall or excess together, with there being no basis for considering a 'surplus' in the Ken Basin.** Runoff data was

particularly difficult to obtain for which PSI used a model. The PSI checked their model against a limited real-world data set, and found good agreement with their predictions. The PSI also looked at groundwater reserves and found them to be similar between the two regions, but local variations in geomorphology within the Ken Basin gave rise to a complicated picture.

At this point the pertinent question remains, if the Ken is water deficient during the summer months, and the Betwa region doesn't suffer from less rainfall, runoff or groundwater reserves compared to the Ken region, why transfer water between the two basins? The objective of the project as stated in the DPRs is "to make available water to water deficit areas of [U]pper Betwa basin through substitution from the surplus waters of Ken basin' *(sic)*".

Since a surplus doesn't exist, the claim is reduced to substitute water from the Ken to the Upper Betwa. The Upper Betwa flows through the more commercially and industrially productive Bhopal, Raisen and Vidisha districts, which do not fall within the Bundelkhand region. **An accurate description of the objective seems to be the transfer of water to the more water-hungry Upper Betwa suffering from overintense damming, at the expense of the Ken region already victim to water scarcity.** The KBLP will only deprive the people of the Ken of the water they need while supplying industrial towns and urban centres in the Upper Betwa region, while perpetuating inequitable development agendas.

The Comprehensive DPR mentions changes to cropping patterns wherein all regions supplied by the KBLP would shift to paddy and wheat-centred agriculture. The incongruence between the region's biogeophysical limitations and the imaginations of the NWDA is best represented by their desire to grow only paddy, wheat and soybean as much as possible, despite traditional crops (*Arhar*, *Masoor,* Gram) requiring less water. Local varieties are grown in a slightly higher proportion upstream to Daudhan in the Ken Basin, but these alternatives are left out of the NWDA's plans. Since the soil is largely poor for nutrient intense agriculture in both basins, chemical fertilisers will supplement this agriculture, further damaging the quality of the soil in the long term, and increasing the input costs for farmers caught in debt traps.

The PSI report goes further to say that **both basins, through appropriate planning and management, can meet their current and future water demands.** They suggest a shift towards rain-fed tanks and pools while improving the efficiency of existing irrigation infrastructure to guarantee sufficient water to both basins. **The report also cautions against flooding caused due to dam operation.** The region is prone to cloudbursts and has recorded severe floods. If a dam were to be built, dam operators would be required to open the floodgates, quite literally, to avoid overtopping the dam. This situation poses a great risk for areas *outside* the submergence zone which would be inundated with out of season water flows. These flows destroy crops, submerge arable lands, and are often more intense and damaging than naturally occurring floods.

The report could only discuss the FR since it was the only document available at the time, but criticisms from 2007 are still just as relevant. **The report states, "from the [FR] it would appear that the proposals given are the only possible option, and not that they are the best or preferred option. No competent professional would ever accept such an approach and the NWDA report should be rejected for not adequately examining various design options".**

In a study published by Laxmi Goparaju and Firoz Ahmad at the Vindhyan Ecology and Natural History Foundation with Himanshu Thakkar, the submergence analysis of the KBLP, conducted by **AFC, was found to be incomplete and lacked the basic requirements of a standardised computational geographic study.** An additional 2299.67 ha of submergence inside the PTR area was found by this independent analysis over the AFC's study. **Owing to the lack of documentation in the EIA's submergence data, judging the merits of AFC's study is difficult.** The independent study follows the standards of geographic studies accurately, lending it more credibility (Goparaju, et al., 2017).

The push to construct a mega-hydraulic project inside a protected wildlife refuge sets an alarming precedent. Areas specifically left out of 'development' plans for ecosystem health and ecological diversity if seen as negotiable for development infrastructure and economic growth breach the protection sought to be provided under the Wildlife Protection Act and allied legislation. If the KBLP is pursued to completion,

the limited ecological sanctuaries present in the country will also become replaceable for misplaced notions of development. In a time when discourse around climate change is pushing for increasing ecological diversity and the rewilding of lost habitats, the hydrocracy and water governance setup in India is pushing in the opposite direction. The dangers of destroying a protected ecological reserve were pointed out by the CEC in 2019, which pushed the NWDA to look for alternatives and reassess their project. The narrative of the NWDA however, treats the CEC judgement as a mere formality, and considers it equivalent to any other clearance. The NWDA has entirely failed to understand the gravity of the judgement passed, and continues to pursue the KBLP in its current form.

Setting aside the 2019 Judgement of the Supreme Court, there is still precedent for evaluating the Court's approach towards construction activity in the PTR. In 2006, plans for the repair of the Gangau Weir were scrutinised by the court, and strict conditions were imposed on the Uttar Pradesh Irrigation Department to mitigate damage to the reserve. The KBLP is in direct contravention to this precedent, and the sanctity of Tiger Reserves under the Wildlife Protection Act is breached. Even if one considers the location of the project inside the PTR suitable, the impact mitigation plans provided in the DPR and the EIA are seriously inadequate and irresponsible, which could never replace the loss of the PTR with its particular ecological and geophysical features.

Possible alternatives have been suggested by activists in traditional systems of water storage which could serve as inspiration for contemporary storage design. Tanks built by Bundela and Chandela rulers in the region have been neglected by the Irrigation Departments of the region, in favour of more permanent dams and canals that directly disrupt the flow of the river. Tanks capture surface runoff from floodwaters, rainfall, and seasonal flows. These tanks, depending on their size, can last a few months or the whole year, to be filled up again in the monsoon. While no one would claim that those solutions must be replicated, local knowledge systems of seasonal flows required to implement less-disruptive and seasonal interventions has disappeared. The regeneration of this knowledge could be vital in tackling the complexity of India's water dilemma and issues of climate change.

The existing Bariyarpur barrage was designed to irrigate a command area of 229,360 ha, but has only achieved an irrigation of 66,000 ha, with all the fallout associated with any large permanent hydraulic intervention. **Experts doubt the KBLP will achieve its claims, considering that nearly all large irrigation projects have failed to meet their proposed benefits in India.** Common Pool Resources, like tanks and ponds, have been supported by the Supreme Court in a 2011 judgement that called for their revival. This push, in contrast to the 2012 judgement, has been met with silence from the hydrocracy of the country.

There has been limited headway made by a few State Governments and civil society organisations in setting up community managed tanks, however popular appeal is still attracted by massive interventions like the KBLP. **Considering the small scale, local scope, and less-disruptive nature of Common Pool Resources, they are flexible to locally-specific conditions and seasonal variations.** Further, they mitigate ecological disruption, eliminate the need for displacement, and do not contribute to climate change and large-scale anthropogenic disturbances of the kind interlinking projects entail. The KBLP has ignored the existence of these traditional systems and will replace these systems by either directly submerging them or through continued disuse in favour of dams. The vast majority of tanks in Chattarpur, Mahoba, and Panna have suffered neglect and encroachment, with some turning into municipal dumping grounds (Gopal & Marothia, 2016).

Voices of Criticism and Dissent

Multiple people, including those within the government, have spoken out against the project. **These voices cannot be ignored, since not only do they represent the interests of the marginalised and oppressed, but they also reflect a broad range of experiences.** Environmentalists, engineers and government officials (serving *and* retired) have spoken out against the project. Criticism has been raised over a long period of time and in different contexts, and has been validated by external scientific inquiry, judicial scrutiny and the inadequate response of the hydrocracy at large.

In 2007, the then District Magistrate of the Panna district, Deepali Rastogi, wrote to the Principal Secretary of the Madhya Pradesh Water Resources Department, Arvind Joshi

(who was later imprisoned in 2015 on charges of corruption) stating that the Ken had no 'surplus' to transfer to the Betwa, and the water of the Ken is needed by the people already on its banks. She added that the transfer was against the best interests of the farmers living in the Ken Basin, and the waters of the Ken would end up being used by those outside the basin (Deep, 2017; Thakkar, 2017).

MK Ranjitsinh, a leading conservationist who helped shape wildlife conservation policies for decades, also opposed the KBLP. A member of the Madhya Pradesh cadre of the Forest Department, he resigned from the Madhya Pradesh State Wildlife Board in 2015, in protest over the interlinking project, and was quoted as saying, "you can either save the Ken-Betwa link project or the Panna Tiger Reserve". The PTR is considered a remarkable success story of tiger conservation, under Project Tiger. Founded and notified under MK Ranjitsinh, the reserve had lost all its tigers in 2008, but witnessed a recovery under a Tiger reintroduction programme, and has 58 tigers today. This programme was initiated under R. Sreenivasa Murthy, the field director at the PTR in 2009. R. Sreenivasa Murthy had also objected to the project and was transferred to Kuno Wildlife Sanctuary shortly after voicing his opposition. In an interview he stated, "Interlinking will be a catastrophe for the Panna Tiger Reserve … The Betwa already has seven dams on it and none provide the [amount] of water for irrigation as was claimed by the irrigation department" (Sehgal, 2021).

The former director of Project Tiger, Hemendra Singh Panwar also criticised the project, specifically describing the DPR and EIA of the KBLP as "deficient, inconsistent and misleading". In a letter to the EAC in 2015, he called out the "half-truths and misinformation [submitted by] the project proponents" and raised serious questions over the viability of the project. He also expressed anxiety over losing critically endangered vulture habitats, and severely harming tiger populations as a result of the bifurcation of the PTR.

Although not in total disapproval of the scheme, Mr. Bharat Singh, chairman of the 'Working Group on Inter-basin Transfer of Water' of the Ministry of Water Resources in 2003, was of the opinion that, "... there really seems to be no convincing argument or

vital national interest which can justify taking up the river linking project in its entirety" (Sehgal, 2021).

Such disapprovals that have emerged from within the hydrocracy and related regulation authorities indicate an unease with the project within the government (at least at the time when these dissenting opinions were expressed). It is important to consider these statements in context to the hazards of disagreement from within government positions. The result is often the dissolution of dissenting committees in favour of more agreeable individuals and transfers or demotions that affect the careers of such "troublemakers" (Molle, et al., 2009; Thakkar, 2019).

Himanshu Thakkar, a member of a 2005 Expert Committee on the ILR, visited the Daudhan village as a part of the committee's initial studies. In 2017, he appealed against the Environmental Clearance awarded to the KBLP, which has been discussed above. Since its inception, he has been an active voice against the ILR project from both within and without, and has documented the failures of the KBLP proposal, much of which has been recorded on his South Asia Network on Dams, Rivers and People (SANDRP) online blog. Dr. Vikram Soni, an environmentalist and retired physicist from JNU also objected to the notion of the ILR, saying "[r]ivers also have an ecological identity which has evolved over millions of years and once damaged cannot be reclaimed. Already, our rivers are hopelessly overdrawn, silted and polluted and we cannot afford to cause further injury to the health of our river basins" (Sehgal, 2021).

Several academics, environmentalists and experts, published an appeal against the ILR after the 2012 Supreme Court judgement. They represented a spectrum of perspectives, from rights activists like Medha Patkar, to policy experts like Sushmita Sengupta. The list of environmentalists and hydrologists against the KBLP goes on. Many of these critiques extend to the ILR scheme as well, with disapproval of several fundamental aspects of water transfers between river basins. In 2016, Dr. Brij Gopal also wrote an open letter to the then Minister for Water Resources, River Development & Ganga Rejuvenation, Uma Bharati expressing concern over the KBLP (Gopal, 2016; Iyer, et al., 2012; Balachandran, 2015).

The KBLP is a poorly planned, unscientific and unnecessary proposal, mechanically generated in the production-line of hydraulic interventions that universally claim to ease India's water crisis. In this cookie-cutter approach, the hydrocracy has once again only confirmed long-standing criticisms of their approach. By refusing to engage with critical discourse, the hydrocracy exists in a state of perpetual ignorance, supported by regulatory authorities uninterested in meaningful regulation practice. This deafness provides a wide berth to a 'business as usual model' – a model that has been sufficiently disproven and worsened the situation in many regions, but is nevertheless maintained. To provide a larger picture of the hydrocracy in India, the sections below first touch upon critiques of the ILR, and later discuss the failures of water governance in India understood as a consequence of structures of social and political relations.

The Disasters of Interlinking

Throughout it's almost 70-year long history in Independent India, the notion of interlinking in various shapes and forms has always disturbed its opponents. Critics have included environmentalists, ecologists, activists, and civil engineers who have asked important questions of the project that remain unanswered. Despite their efforts to engage, the discourse resembles a war of attrition with the government increasingly disinterested in critique.

Critical insights are crucial to problematize the "ultra-project" impulse that is central to the ILR's existence. Institutional norms and behaviours that are entrenched in large, centralised hydrocracies explain the resistance of the hydrocracy towards much needed change. The hydrocracy thus insists that dominant approaches are the best option possible, and the many well-documented failures of massive supply-side hydrology are only failures of implementation or circumstance. This insistence reflects the ever-growing importance of critique that problematizes unilinear narratives of government, while contributing to larger epistemic commitments founded on disquieting oppressive power relations within society.

Water governance transgresses disciplinary boundaries, for which reason, a window into relevant debates and criticisms is attempted below. This section also hopes to discuss why *any* ILR project is too dangerous to attempt, and pre-empt a discussion towards alternatives that have always been possible, often drawing from traditional practice, but have never been considered seriously by modern hydrocracies.

Scientific Consensus

There is a consistent scientific consensus among relevant epistemic communities that a reductionist "arithmetic hydrology" paradigm has weakened ecological resilience by disturbing natural stocks and flows. Riverine ecosystems are complex, with their biogeophysical interdependence spanning scales (micro to macro) and times (short to long term). Rivers are also central to the social and cultural practices of the riverine communities, where the disruption of river flows in turn disrupts (already at-risk)

communities. It is highly unscientific to consider rivers as mere channels of flowing waters, that can be rearranged to suit exclusionary anthropocentric demands. To quote Ramaswamy Iyer (2007), "Rivers are not human artefacts; they are natural phenomena, integral components of ecological systems, and inextricable parts of cultural, social, economic and spiritual lives of the communities concerned. They are not pipelines to be cut, turned around, welded and rejoined".

Ecosystem health is directly related (in an interdependent manner) to water quantity and quality, agricultural production, and human health and comfort – the goals of any irrigation scheme. Decentring perspectives to incorporate a 'systems approach' to environmental governance, and considering multiple perspectives beyond the mainstream is necessary to understand the complexity of the biogeophysical world, and the ways in which humans can interact with it without irreversible damage. Climate change must also be considered a serious determinant of government policymaking and developmental goals, since an increasingly-disruptive climate has major implications for environmental futures. Global biogeophysical health is thus intertwined with human wellbeing, and responsible decision-making must reflect this reality.

The rainfall received the Indian monsoon is the largest determinant for agriculture and irrigation policy in India. The ILR is based in the idea that surpluses of rainfall that flow within rivers will be captured and redistributed. An analysis of daily rainfall data over a century, led by S.S. Gunthe at the Indian Institute of Technology, Madras found a contrast between the trends of spatial variability of mean and extreme rainfall over India (Ghosh, et al., 2016). Their findings present a complex picture where the variability of extremes over land area is strongly increasing, while the variability of the mean rainfall over land area is decreasing. Thus India on the whole might receive more uniform rainfall across its landmass, but in extreme measures. They questioned country-wide solutions like the ILR and underlined the need to study projects in context of climate change. While only indicative, the uncertainty of climate change effects was made clear in their study. In broader terms, **the ILR scheme lacks the nuance and foresight necessary to account for the unexpected effects of climate change, given the complex and altering nature of India's rainfall patterns.** Further, since these changes are difficult to

predict, with models only presenting the best-known possibility, projects that are highly permanent and at the scale of the ILR are extremely unsuitable as interventions.

Evan Grant's group at the United States Geological Survey Patuxent Wildlife Research Centre looked at the changes to freshwater fish biodiversity due to basin water transfers using data from peninsular India. Their work found that the alteration of river network connectivity due to IBWTs changes the biogeography of rivers and decreases fish biodiversity (Grant, et al., 2012). Common and widespread species with large populations tend to replace endemic and rarer species due to their numerousness, especially in areas like the Western Ghats, where endemicity is high. **If the ILR is carried out, it is highly likely that region-specific fish species would suffer while already well-established species, including invasive varieties, would become widespread.** Underlining that their study is limited to the *minimum* impacts of IBWT on biodiversity and biogeography, they brought attention to other factors that were outside the scope of their work like the amount of transferred water, asymmetric competition, trophic interactions and effects on larval stages of fauna. While they suggest alternative linking strategies to mitigate this loss, **they maintain that ecological consequences are in tension with economic considerations and policymakers often prioritise the economy** (Best, 2019).

Logan Purvis and Ariel Dinar (2020) from the University of California, Riverside looked at basin water transfers (both intra and inter) from around the world, and scored them on five metrics, incorporating irrigation, efficiency, equity and environmental consideration. Highlighting the lack of studies that look at basin water transfers, their study looked to ascertain the general impacts of basin water transfer projects in a quasi-quantitative manner. **Over a review of 121 basin water transfer projects, they found a slightly negative impact.** While the authors point out that their scoring has its limitations and those valuations are context specific and subjective, the study still underlines serious problems inherent with large hydraulic interventions like IBWTs. The paper underlined the necessity of demand-side solutions and due consideration to shared human and environmental rights. The authors remained unconvinced that IBWTs are effective hydraulic intervention policy, and strongly advocated for alternative public policy.

The *Dams and Development* report by the World Commission of Dams (WCD) remains till date the most comprehensive review of hydraulic interventions across the world (World Commission on Dams, 2000). In no uncertain terms, **the WCD underlined that "[i]n too many cases an unacceptable and often unnecessary price has been paid to secure [the] benefits [of dams], especially in social and environmental terms, by people displaced, by communities downstream, by taxpayers and by the natural environment".** After 21 years, the WCD's overall framework still stands ignored or rejected within India's hydrocratic circles.

The government and hydrocracies silence on cutting-edge academic work and landmark studies, like the WCD report, brings into serious question the pursual of the ILR scheme. **Despite overwhelming natural and social scientific consensus, the hydrocracy remains adamant of its methods, while failing to meet the (inadequate) regulatory standards that already exist.** The NRLP/ILR is a result of the hydrocracy's incapacity towards progressive change and censure of complex discussions, in favour of quick-and-easy policy solutions. The following sections look at the emergent characteristics of systemic and structural issues and explains observed institutional norms and behaviours.

International Issues

There remain multiple issues with the ILR beyond those investigated from a natural scientific perspective. Many of these have been referenced in previous sections about the KBLP; however, this section will give them a formal but short treatment to serve as a crystallisation of the recurring themes in this report. These issues have found relevance across disciplinary boundaries, and are meant to expand the scope of the argument made here. Since the treatment here is brief, these are only illustrative of much broader debates, which the hydrocracy must *engage* with.

The international political aspect of India's hydraulic projects, especially in the Himalayas are often not considered by the hydrocracy, and their arguments retain a strictly domestic scope, despite their projects impinging on existing treaties and water-sharing agreements. In the case of India-Nepal relations, four links from the ILR stand out, namely, the Kosi-Mechi Link, the Kosi-Ghaghra Link, the Gandak-Ganga Link and the Ghagra-Yamuna Link.

Dwarika Dhunge and Santa Pun (2008) underline how as per then Ambassador to Nepal, Shyam Saran, the ILR scheme was "merely a concept" and thus not urgent to discuss. However, there was some attention given to storage projects upstream to these links at bilateral water conferences between the two countries. There remains a history of tension and dissatisfaction between the two countries over questions of water diplomacy and fulfilling mutual interests. For instance, when plans for diverting the waters of the Ganga to Farakka for the Kolkata Port were drawn up in 1979, India and Bangladesh moved to include Nepal in the discussions. There was however, disagreement between both countries over the extent to which Nepal would be a partner within the deliberations. While Bangladesh wanted Nepal to be present as an equal partner to ensure long-term and invested cooperation, India wanted Nepal to only assist with data sharing and the studies necessary for the project, without being included in the joint committee. When the three countries finally met in 1986, Nepal was asked only to support the project with data sharing, in line with India's interests. Some in Nepal were disgruntled with Bangladesh over approaching in partnership with India, since Bangladesh ended up agreeing with India's preference for offering a lesser partner status to Nepal.

There is thus mistrust, not specific to water sharing, but in general over India's "elder brother" like approach to its smaller neighbours in Bangladesh, Bhutan, and Nepal (Hanasz, 2017). These fears have resulted in a general coldness in relations between India and its smaller neighbouring states – which has been a matter of worry for Indian foreign policy owing to the rising threat of China as an economic and geopolitical rival. This mistrust isn't without reason, and India's heavy-handedness with regard to conceiving interlinking projects in Nepal, with almost no deliberation with their Nepalese counterparts is worrying, setting off alarm bells in Nepal. Submergence is a sensitive topic for the Nepalese government, since arable land is at a premium in the country and the opinion remains that infrastructure funded by the Indian government accrues benefits largely back to India, while destroying land in Nepal, displacing Nepalese people who receive less than their fair share of project benefits. While the true nature of these "benefits" of large projects is discussed later in this piece, this international perception is crucial to the feasibility of the ILR scheme as a transboundary project. **If the concerns of direct consequences of the plan and those of equal partnership and mutual benefit**

aren't met, the ILR scheme could strain the India-Nepal relationship further and create long-lasting points of friction between the two countries (Dhunge & Pun, 2008).

The case between Bangladesh and India is similar; however, Nepal is largely an upper riparian country to India while Bangladesh is largely a lower riparian country and thus is greatly affected by minimum flow requirements and the downstream effects of the hydraulic interventions. The Sundarbans delta formation depends upon the deposition of silt from the Ganga, Brahmaputra and Meghna river systems and storage projects upstream have reduced silt loads and thus affected agriculture patterns of the people of the Sundarbans delta. **The risks of losing swathes of the Sundarbans to rising sea levels and extreme climate is worsened by damming upstream rivers and reducing silt deposition in the region. There are thus immense known and unknown ecological consequence for the deltaic region, large parts of which fall within Bangladesh.**

The links that concern Bangladesh directly are the Ganga-Damodar-Subernarekha Link, the Subernarekha-Mahanadi Link, and the MSTG Link. All the studies conducted for these links have excluded Bangladesh, thus from the Bangladeshi point of view, the studies are of limited value (Bricheri-Colombi, 2008). Based on previous treaties between the two (and sometimes including Nepal, three) countries, the precedent is that of equal sharing. For rivers that have not been agreed upon, like the Teesta, the convention of equitable sharing holds, to be observed by all nation-states. **While it stands on precedent that an equitable sharing of benefits would be expected in the case of the ILR scheme; the NWDA has communicated no intentions toward realising equal water sharing while interlinking.**

None of the countries that share the Ganga-Brahmaputra-Meghna system are signatories to the UN's 1997 Watercourse's Convention, which sought to regulate non-navigational uses of transboundary waterways. Thus, **the only treaties that have been signed exist at the region-level, usually as bilateral agreements, perceived to be in-line with Indian preferences and thus generating discontentment in the international neighbourhood.** Five main treaties exist currently: Ganges Water Treaty (1996), India-

Nepal Power Trade Agreement (1996), Mahakali Treaty for the Pancheswar Dam (1996), India-Bhutan Agreement for the Tala Hydropower Project (1996) and the tentative four-nation (India, Bhutan, Nepal and Bangladesh) agreement on economic co-operation (1997)).

Considering the complexity of the ILR scheme, and numerous fundamental issues associated with each link (like the danger of soil liquefaction associated with the Jogighopa-Farakka Link), **the ILR would almost certainly become a point of tension between India, Bangladesh, Nepal and Bhutan.** The threat of water-scarcity could transform (even initially-agreed upon) hydraulic interventions into political flashpoints, aggravated by the unpredictable and widespread effects of climate change on water availability and use (Bricheri-Colombi, 2008). As illustrated above India has preferred bilateral discussions on international river treaties over multilateralism favoured by the neighbouring states of Bangladesh, Nepal and Bhutan. Such differences have strained talks and relations within the neighbourhood, and the ILR scheme will only serve to worsen these tensions and weaken India's still-positive relationship with its smaller neighbours (Khalid, 2004). While International Law guardrails transboundary issues to a certain extent, the weakening of multilateral institutional sentiments in the region could make ILR-like projects even more dangerous for India's diplomatic interests.

Taking measured and transparent steps while discussing interventions on any river system is important – with additional sensitivity necessary with transboundary issues. Access to water is anything but politically benign and given the right conditions, permanent interventions can and have sparked controversy and disagreement. Taking into account how India and its neighbours are already suffering from the environmental and social fallouts of their excessive command-and-control water governance paradigm, there is a need to shift focus and discuss smaller-scale, locally relevant and rights-based solutions. Transboundary ecosystems disregard political boundaries, but shape the lives of people bound by political realities. Sensitive and thoughtful interventions are thus necessary – ones that avoid creating environmental, social and political disasters.

The next section expands on the failures of the dominant command-and-control paradigms that are negotiated within international diplomacy, while ignoring alternatives.

While focussed on India, the commonalities between various hydrocracies around the world shape international agreements over water governance and suffer from many of the same issues. The general idea remains that hydrocracies are in dire need of reform, and at international interfaces, considering water policy as a part of *realpolitik* can often produce disastrous results. Thus, hydraulic interventions cannot be traded as diplomatic negotiations, needing instead good faith scientific and social analysis to be of any use.

Failures of Hydraulic Interventions in India

The discussion here provides a broad view of decades-long criticisms of the hydrocracy largely related to project implementation and management. These issues are common to nearly-all large and permanent hydraulic interventions, by extension plaguing the ILR. The ILR scheme cannot be viewed in isolation as a problematic proposal that can be replaced by other interventions that come out of the same hydrocratic thought processes. A larger review of these fundamental issues is necessary to understand why the hydrocracy remains trapped in certain practices, and the kind of institutional reforms necessary to improve the situation. Answering why the problems of the bureaucracy are recurrent and predictable thus requires a critical eye at the institutions responsible.

Procedural Apathy and Bias

As observed in the case of the KBLP, the clearance process in India is opaque, apathetic, and biased. This feature is not unique to the KBLP in any way, and as mentioned earlier, is only a symptom of a much deeper and long-standing malaise. Institutions responsible for safeguarding environmental protections and balancing ecological considerations with development have become entrenched in a system that favours project proponents, regardless of the merits and demerits of the project itself.

The organisation International Rivers in August 2013 published a report highlighting multiple disturbing aspects of the Dam sanctioning process in India at large. The failed process of the KBLP finds loud echoes throughout the report, impugning the rest of the ILR scheme as well. Some of the most disconcerting issues and norms of the clearance process have been highlighted in this section (International Rivers, 2013).

The inadequacy of public hearings, as in the case of the KBLP, is common. Since there is no active monitoring of these hearings, there is no scrutiny of the legitimacy of each hearing. Even in cases where activists and project affected people have raised valid concerns with the EAC, backed with proof, clearances are granted regardless. The EAC has till date not asked for public hearings to be repeated, despite extensive

confirmation of the breach of government rules and the disruption of the hearing process.

The refusal to include downstream communities and share data publicly is another indication of the careless approach of the hydrocracy. Despite there being an obvious necessity to conduct hearings downstream of the project, the CWC disagrees and insists on requiring hearings only upstream of the river. On the lack of data, despite interventions by the courts the hydrocracy chooses to remain blissfully ignorant and ends up obstructing the public consultation process. According to the report, **52% of large dams recorded in the National Register for Large Dams fail to mention the river they are built on. These kinds of data gaps are commonplace** (more common than the availability of good data) across government databases and archives.

Perhaps the most worrying institutional norm in project regulation is the insistence of the EAC on clearing projects regardless of their demerits, sometimes against the recommendations of other clearance committees. This was seen in the case of the KBLP as well where NBWL and FAC recommendations were ignored while awarding the project the Environmental Clearance, however, the issue is deep rooted. As per the report, **the EAC for River Valley Projects (RVP) has never rejected a project it has examined.** Despite the report being a little dated, this claim is still true. Till 2012, TORs for only 2 out of 262 projects were rejected; and those rejected were allowed to resubmit a reworked proposal. The EAC thus chooses to allow umpteen changes and modifications to every proposal it considers, even if the project remains fundamentally disastrous. **After some back-and-forth, every project is ultimately approved** (Thakkar, 2019) and the KBLP (Phase-I) was no exception.

The excitement to clear projects while disregarding prudential regulation is closely related to the state revenues from the upfront payments made by dam developers (International Rivers, 2013). These premiums are charged before any clearance is accorded to the project and the payments are non-refundable. The amounts paid to State Governments vary widely, since there are no formal rules or guidelines that govern these upfront payments. Considering the sums involved, state revenues can earn a massive boost to their budgets but in turn face pressure from project proponents to

clear their proposals. State Governments then compel the Centre to clear their proposals. **This pressure adds to the pro-project bias of the hydrocracy and projects are allowed to pass.** The system so created doesn't value the mitigation of ecological stress, displacement outcomes, long-term risks, or the necessity of the proposal, but rather builds around the financial benefits that accrue to the governments involved.

While the low quality of the EAC's environmental insight (and the hydrocracy's insight in general) has been described in context to the KBLP in this report, the International Rivers report offers a more general assessment. **The report describes the arbitrariness of the CWC and the EAC in setting guidelines for hydraulic interventions.** These guidelines lack a natural or social scientific basis, and serve the hydrocracy's aspirations, which typically oppose environmental health and public wellbeing. **A key concern has been the EAC's disregard towards setting guidelines environmental flows and basin-wide studies.** Flows that are necessary for ecosystem health must be observed when a dam is constructed. However, the CWC and EAC have prescribed ad hoc guidelines, which are themselves often not followed. The EAC requires 20% of the average seasonal flow to be released in the dry season and 30% for the monsoon. The arbitrariness of this requirement is best demonstrated in the EAC's negotiations with project proponents when these flows cannot be met in the project proposal.

Once again, project proposals are placed above environmental considerations (along with the requirements of the EAC being unsystematic themselves). In line with this unsubstantiated approach, the cumulative effects of hydraulic interventions are ignored, and alterations to river flow are not studied. According to the then Chairman of the EAC Rakesh Nath, the rule of thumb followed is "[the requirement of] one to two kilometres between the tail race of the upstream dam and the tail end of the reservoir of the downstream dam". However, this requirement has not scientific justification, and is itself not met, as is the case with the Kuther and Bajoli hydropower projects on the Ravi River (International Rivers, 2013).

This report has also noticed another gap in the guidelines over the lack of clarity around changes made to project documents during clearances and project implementation. As described before, the Comprehensive DPR of the KBLP

communicates significant changes to the sub-projects that were cleared under earlier versions of DPR. As expected, the standard practice has been to ignore these differences and inconsistencies, allowing substandard projects to go ahead. There are no clear guidelines to oversee these changes, allowing the hydrocracy unregulated flexibility that works in favour of project proponents.

Himanshu Thakkar, in his decades of interactions with the government, believes that "the EAC has shown [a] strong bias against people, the environment and all those who represent the interests of the local communities and the environment" (Thakkar, 2019). The International Rivers report and this piece are strong cases in favour of this account**. While the contentions highlighted above are related largely to dams and related irrigation projects, they are equally relevant for the ILR since the ILR is a series of dams and canals, fashioned for a slightly different purpose.** Further, the same clearance authorities and 'professional' technical bureaucracies are responsible for the implementation and administration of the ILR project. The KBLP shows unsurprising similarities to the trend, raising serious doubts over the rationale of the interlinking scheme.

Glorified Benefits and Disastrous Management

A trend seen in almost any large hydraulic infrastructure project is the constant revision of project benefits through various interventions after the first proposal. These include recalculations of water availability, often using unknown data sets and models, increases in proposed irrigation infrastructure like pipes and channels, and suspicious cost-benefit analyses that often ignore or diminish essential costs while inflating benefits in their calculations. **Boosting project benefits in the planning stage is an attempt to advertise an environmentally damaging project surrounded by unanswered questions and an incapable clearance system as a palatable policy intervention, which can be marketed by politicians, bureaucrats and infrastructure firms.**

This tendency is also seen in the KBLP where the revised 'Comprehensive DPR' increased the reported values for irrigation, industrial, and drinking water supply by tacking on additional infrastructures. Those under Phase-I seem to stand cleared based on the clearances already provided, despite significant changes to those project components.

Upon revisiting mega-projects that have already been implemented, one finds a stark trend of underperformance and mismanagement. Reports on the Bhakra Dam (Dharmadhikary, 2005), the Sardar Sarovar Project, (TISS, 2008) and the Hirakud project (Nayak, 2010) – are all massive hydraulic interventions constructed decades ago and considered the greatest infrastructural feats of India's modern hydrocracy, point to underperformance and the lack of promised benefit, along with very troubling ecological and social consequences.

The case of the Upper Indravati Hydroelectric project in Odisha is germane to the complexities of dam management and poses difficult questions about the resettlement paradigm in India as well (Choudhury, et al., 2012). The reservoir of the project connects the Godavari to the Mahanadi, through the Hati and Tel tributaries of the Mahanadi basin. Due to the link, the banks of the Tel River are susceptible to severe flooding, especially during the monsoon. Villages like Kantamal in the Boudha district and multiple villages in the Kalahandi district (not considered under the resettlement plan, since they are downstream of the Indravati reservoir) are regularly flooded especially during the monsoon. Since these villages historically were not subject to major floods, local knowledge and practices (of farming, building and so on) are blindsided by the now-regular flooding caused by damming and canal-building.

As highlighted by many activists and scientists, dam construction has intensified the severity of floods and droughts due to the flawed planning and mismanagement of hydraulic interventions in India. Dams are too large, too numerous, over-engineered, and have starkly contrasting outcomes to those claimed by the hydrocracy. While the hydrocracy publicised dams as flood and drought control measures, their effectiveness in practice is quite the opposite. In many cases, the presence of a dam has been found to exacerbate floods and droughts, often also creating pulses of artificial floods and droughts. **During the monsoon when flood protection is required against floods that are at their most common and severe, water stored in dam reservoirs is released to protect the dam itself.** Since dams are filled as soon as water is available, they have a low flood moderation capability. In times of increased flow, the risk of overfilling the dam also increases and the stored water is released, adding to natural floodwaters. This causes a sudden burst of water directed at downstream communities which is more

difficult to prepare against than natural floods. These surges are sudden and authorities often refuse/ignore the sharing of information around water release with downstream communities. The presence of a dam can also contribute to lower expectations of a flood in the first place, thus lowering flood preparedness for what is often a more intense flood. **These issues come together to create extreme flooding events, sometimes in historically non-flood prone areas, which consequently have lower preparedness – causing widespread material destruction and social suffering**. Natural floods that break the river bank generally occur over longer periods of time and follow the contours of the geography. It is thus easier to avoid destruction and even gain benefit from natural flooding events, while permanent and large dams are bogged down by bureaucracy, and are too intense to control (Ghosh, 2021).

Siltation of dams along with other kinds of construction debris can lead to dam breaches as seen in Uttarakhand in 2013 and again in 2021. Dams were found to have exacerbated floods multiple times, including but not limited to, large flooding events on the Tehri Dam (2010), Hirakud Dam (2009, 2011, 2014), dams on the Damodar (over multiple years), dams on the Krishna (2006, 2009, 2021), Ukai Dam (2006) and the Chennai floods (2015). Dams regularly worsen flood-like situations outside huge flooding events as well, and there has been an increase in land area affected by floods downstream to many dams (EPW Engage, 2021). **When put together with the climate change caused threat of Glacial Lake outbursts in the Himalayas, dams as they are envisioned in the ILR will only worsen the situation.**

During dry spells when stored water is most needed downstream, dwindling water reserves are stockpiled in dam reservoirs to maintain a 'minimum reservoir level'. This water is often not released in time to irrigate fields, especially those belonging to smaller landholders and farmers. **The ignorance of dam operators to the needs of farmers to whom the bulk of the benefits are initially committed is an open secret and hasn't been addressed by the government.** In this case, the reluctance of dam operators to share data with downstream communities leads to failed crops and drought-like conditions. Thus when dams are supposed to help irrigate fields the most, the maintenance of the dam often takes priority, depriving farmers and other supposed beneficiaries of access to dam water.

Issues of Resettlement and Rehabilitation

The failure of the Indian state in guaranteeing appropriate resettlement and rehabilitation (the term rehabilitation is used as shorthand here) to project affected people and communities is not just a problem of process but stems from institutional behaviours of the hydrocracy. This issue deserves a separate section, owing to the complexity of the issue. At its core, two main problems can be identified with the rehabilitation scheme in India. Firstly, the rehabilitation promised is meagre, deepens inequality, deprives the landless further, and often leaves out the most-deprived subaltern. Secondly, promises are rarely delivered, usually partially realised only after long and drawn-out legal challenges, benefitting people along the contours of intersectional social privilege. The lack of guidelines and rules over the monitoring of the rehabilitation process and the absence of any legal framework to challenge decisions made over rehabilitation allows the hydrocracy massive room for manoeuvre, and perpetuates the cycle of institutionalised ignorance. In essence, once irrigation projects are sanctioned with stencilled rehabilitation plans that follow a strict, unthinking template, the hydrocracy moves on to the construction while largely ignoring ecological and social commitments.

The failure to rehabilitate project affected people is deeply entrenched in the functioning of the hydrocracy. The notion of what counts as 'affects' itself is largely determined by the hydrocracy while ignoring any local context and contentions on the ground. **Large-scale and long-term lapses over rehabilitation practices are a certainty in any irrigation project in India.** These have been well-recorded over multiple projects, with larger projects being more disastrous, including (but not limited to) the Sardar Sarovar Project, Bhakra Dam, Hirakud Dam, Ukai Dam, and Koyna Dam. Nearly every project carries with it widespread stories of unfulfilled rehabilitation, ignored once the dam is up and running. Snippets of two major failures in Hirakud (Dansana, 2021) and Bhakra (Dharmadhikary, 2005), are provided as illustrative examples.

The construction of the Hirakud dam displaced about 100,000 people in Odisha alone (some in present-day Chhattisgarh which at the time was part of Madhya Pradesh). This included the submergence of 325 villages (291 of which were in Odisha)

and 74,000 ha of land of which 50,000 ha was land under cultivation. Compensation for land lost depended on the classification of the soil in terms of productivity and could range from Rs. 50 to Rs. 1000 per acre based on the rehabilitation policy created for the Hirakud project in 1946. In practice, the compensation provided was below market price, between Rs. 200 and Rs. 600 per acre. **The displaced mostly relied on agriculture as a source of livelihood; however, they no longer owned their small landholdings, and now lacked a consistent source of livelihood.** Fishing and collecting forest items form an unreliable source of income, with most looking to work in urban centres as migrant wage labour. Around 4000 families did not receive compensation, and records have since been destroyed, making compensation near impossible to claim today.

Around 34 villages on the unsubmerged lands of the reservoir were classified as 'non-revenue', to where many of the displaced moved, has resulted in the displaced being treated as encroachers rather than oustees, who are now denied any revenue-related developmental smes. In recent years, the dam operators discontinued the process of leasing their land out to these villagers for agriculture, further diminishing their livelihoods. **Attempts made to give some relief in 2005 and 2011 by the government saw little success and the diversion of river water to industries continues endangers the livelihoods of thousands of farmers and fishermen.** A generation later, those displaced are ignored from representation at the panchayat and block levels, and the hardships they face have induced a mistrust of the political system, with the oustees choosing to avoid discussions altogether, creating a vicious cycle**. Their condition is described as an "identity crisis, destitution and statelessness", where the displaced have become outsiders despite promises of rehabilitation and equal compensation by the government** (Dansana, 2021).

In the case of the Bhakra Dam, a similar story emerges. The claims and contestations from the Bhakra project were still unsettled as late as 2005 (the latest date for which this author found a ground-level analysis), 50 years after the project was inaugurated, with the displaced struggling to achieve normalcy two generations after their displacement. Promises of water and electricity were unfulfilled – with villages waiting to receive water and electrification, monetary compensations were underestimated and paltry, and homeless villagers struggled to find support systems after resettling. Since existing social

relations and support systems were uprooted, their struggles to resettle on their own efforts were aggravated. The landless were given a small monetary compensation and forgotten. The mood of those forced to move was initially of pride and self-sacrifice, but today the feeling of betrayal is prominent in the minds of the displaced (Dharmadhikary, 2005).

Lyla Mehta (2013) brings multiple authorships together with insights of her own to critically bear upon the paradigm of dam development in India. While focussing on resettlement and rehabilitation in the Sardar Sarovar Project on the Narmada River, she argues that **dominant models of well-being used by the hydrocracy are ignorant of the multidimensional nature of water flows and human wellbeing. These dominant models legitimise the process of marginalisation which affects nearly all of those displaced by large hydraulic interventions.**

On the field in the Vadodara district of Gujarat, Mehta contrasts Malu, a resettlement village with Gadher, an *Adivasi* village that was submerged forcing its residents, largely of the Vasava *Adivasi* community, to move to Malu**. Despite water sources being built closer within Malu, these sources are often out of working order and their quality of water is questionable.** Conflicts between the residents of Malu and villages that host better sources of water have become commonplace, and the autonomy once enjoyed by the women (who require water most often for gendered household work) in their access to water has been lost. Social and family relations within Malu have also become increasingly strained, since otherwise nuclear families are forced to live under the same roof, while struggling to access water.

The health of displaced communities has been negatively affected due to the careless resettlement process. Villagers living in Malu talk about an increasing mortality, lowering immunity and decreasing levels of fitness. Analysis by government teams confirmed the poor quality of water, finding it chemically and pathogenically unfit for consumption, however the pollution control board claimed it to be a state-wide problem and offered little reassurance or assistance. Health authorities, even in genuine attempts to heal, make no attempt to understand their patients and their self-understandings of ailments. These disconnect *Adivasi* people and move them to the periphery of a system

they were expected to be incorporated into, while eliminating access to their traditional healthcare practices. **The constant discomfort and health hazards of being forced to live outside traditional ways of living is a far cry from the claims made by the government of providing better lives to the displaced if allowed to plan for displacement caused by hydraulic interventions.**

For the Vasava people of Malu, nostalgia and memories of their lives close to the Narmada are apparent, despite their lives being tough earlier as well. The destruction of social and cultural identity associated with the river is perhaps the most pernicious element of their new lives. For such riverine communities, there exists spatial and temporal centeredness of the river within their lives. Kinships are broken, traditions are weakened, social dynamics are changed, and communally-held meanings are lost. This forms a source of estrangement between generations and disorientation around once-regular activities which become difficult to carry out. Physical environments are intertwined with human lives, and for *Adivasis,* their subsistence derives from their immediate biogeophysical environments. The wellbeing of their environment thus correlates to their own mental and physical wellbeing. While the lives of the people living in Malu continue, irreversible damage has been inflicted upon the people.

These stories are consistent across nearly every large water engineering project, going back to pre-independence water governance. There thus also remain alarming similarities between the treatment of those displaced by the Crown and the Republic. To understand the imminent dangers of the ILR scheme, in terms of widespread displacement and related suffering, it is necessary to recognise the institutional failures of the hydrocracy that create disastrous outcomes consistently. These failures have become features of the hydrocracy, which has used its empowered authority to enrich a select class of people (rich farmers, the urban class and industrialists) while remaining apathetic to those worst affected from marginalised and subaltern communities. While a select few benefits might be released to marginalised people in response to criticism and scrutiny, the pattern remains unmistakably skewed against them. Planning and implementation of resettlement and rehabilitation varies from state to state but usually has proceeds on an ad hoc basis where incremental changes are made in response to external challenge, rather than scientific rigour and expertise.

It is also common to see narratives that seek to portray project affected people, and those who speak in their interest, as opportunists and the hydrocracy as benevolent rulers trying their best to "serve the people" (Thatte, 2009). These narratives often question the motives of activists and community leaders, despite clear signs of the hydrocracy failing its own guidelines and avoiding transparent engagement with the specific contestations of those affected. **The suspicion of the hydrocracy towards the claims of the displaced is yet another symptom of a systemic marginalisation of the poor enacted through permanent large-scale hydraulic interventions.**

The rehabilitation plan created for the KBLP is nondescript at best and considering the colossal nature of the project, and India's history with large hydraulic projects, one would expect a project design of exceptional quality in all respects (and thus also complicated by dissenting judgements from within the hydrocracy). The government's treatment of the ILR is only reaffirmations of long-held notions around the hydrocracy, and thus fail to inspire any confidence in the projects. To provide a robust political analysis of the institutions responsible for these outcomes, the next section looks at critical work around the hydrocracy and its functioning as institutions of water governance.

Critically Analysing the Hydrocracy

Tracing the histories of hydraulic interventions in India, Rohan D'Souza (2008) **details the portrayal of large dams and MPVRDs as "neutral technological artefacts", with a long history of a (false) political neutrality attributed to such interventions.** As detailed in the sections above, colonial hydraulic interventions sought to replace variegated and diverse practices surrounding flood plain use that were specific to local contexts, with simplified and easily administered agricultural territories. The post-independence Indian project looked at dams as techno-economic tools, to be deployed nationally in an attempt to harness natural bounties for national projects. While stated beneficiaries differed, the decolonised followed much in the footsteps of the coloniser.

According to D'Souza (2008)**, the "cost benefit analyses" (CBAs) of hydraulic interventions are a crystallisation of many of the fallacious practices of the hydrocracy.** The CBA ratio must favour the project for the hydrocracy to consider it and is calculated with the assumption that all the impacts and benefits of a project can be simply tabulated and monetised to prove the overall benefit of the project (D'Souza, 2008). Contesting this simplicity, D'Souza points out multiple issues with CBAs. Costs are calculated only over the expected lifetime of a dam, and long-term consequences are absent. Realities of ecological processes are in effect subordinated to economic quantifications. Closely related is also the confusion over the process of arriving upon these quantifications in the first place. While it is often market price values that are used to price the commodities lost, unquantifiable valuations are entirely left out of this process (by the very nature of CBAs). In effect, argues D'Souza, the process is a political arithmetic, where the choices made to calculate project metrics, including the CBA, are based on political realities rather than scientific rigour, altered to suit positive perspectives around projects. These metrics are then displayed as politically benign and neutral. The absence of reliable data, say on ecology, diversity, and hydrology, further implicate CBA analyses as political instruments used to justify hydraulic interventions, rather than genuinely consider their negative consequences.

The supposed benefits of the Green Revolution that are often cited to justify greater hydraulic intervention, accrued largely to cereal production. **In the long-term the Green Revolution has brought with it the second edge of a double-edged sword.** Waterlogging, salinization, loss of soil quality, and stagnating yields have forced higher input costs upon farmers, lowering their profits. The simplistic paradigm of the hydrocracy which pushed the Green Revolution has a poor long-term record. While short-term benefits are celebrated, longer-term consequences are forgotten and the cycle is repeated.

Water management in India is largely controlled by centralised water bureaucracies, contractors, private engineering firms, international financial organisations (such as the World Bank and Asian Development Bank) and powerful political lobbies. In the process of creating an 'expert-centric' network of institutions, locally relevant participatory approaches have been side-lined. These export-driven institutions have expressed their fiscal and political power to systematically expropriate indigenous water management techniques, and continue to displace the marginalised to supply consumer economies globally.

This paradigm, referred to as 'supply-side' hydrology, is fraught with issues and has been problematized mostly due to its ecological consequences. Choosing to acquire additional water supply for developmental projects (in effect attempting to increase stored water supplies) has necessitated the creation of large dams, canals and hydroelectricity plants. This model in practice ignores local complexities, especially those of competitive social interests and political economies. Noting how projects are increasingly supplying water for industrial and urban consumption, D'Souza points out that "the dam enables the transfer of a region's hydraulic endowments to already empowered beneficiaries with the costs borne by dispossessed project-affected persons and marginal communities". Commenting on the ILR scheme, D'Souza (2003) describes it as the hydrocracy's "last gasp" towards maintaining a supply-side hydrology paradigm. The same mistakes that have already been made are waiting to be made again, and there is little evidence to suggest that water governance in India has made concrete steps at avoiding disaster. By suggesting the ILR as the next step in India's water futures, the hydrocracy is in effect

ascertaining continuity in its supply-side paradigm, making little effort towards considering alternatives.

Considering their outlook towards benefitting the marginalised, the hydrocracy has neither designed participatory resettlement schemes nor seemed interested in less violent forms of water governance even when prompted, and continues to remain adamant about conducting business as usual. Pointing to the impacts of dams on vulnerable communities require evaluations beyond simple monetary assessments like loss of land, Lyla Mehta (2013) considers water as a broader resource, with material, symbolic and cultural values that relate to wellbeing. The hydrocracy does not converge with such holistic thinking, reflected in their treatment of project affected people and ecosystems.

Mehta points to two possible interpretations of the hydrocracy's behaviour that can be drawn from her study of the Vasava people. The first, more charitable to the hydrocracy, sees the hydrocracy as merely ignorant or unwilling to learn. They label *Adivasi* people as 'backward' and coming from 'wildernesses', and maintain that the resettlement allows their communities a chance at integration into modernity. The growing pains of resettlement are only temporary and in the longer term, the *Adivasi* people benefit. The second interpretation, with the greater explanatory ability, is also more cynical. **Mehta contends that the indifference of the hydrocracy towards those displaced is not merely incidental or unintentional but rather instrumentalised into their functioning, allowing them the freedom to reroute water to the empowered from the resource-wise rich lands of the power-wise poor *Adivasi* people.** This resource economy is not limited to water, and extends to all kinds of displacement, where a valuable commodity stands to be extracted (be it bauxite, coal, gemstones or water). Institutional alliances that exclude *Adivasi* people redistribute the riches to which *Adivasi* citizens already have a claim. This claim, however, is almost impossible to exercise.

François Molle et. al. (2009) **have written about hydrocracies and what they call the "hydraulic mission"**, in the emergence and maintenance of technocratic hydraulic bureaucracies, which at their height looked beyond providing food and energy, towards an ideological celebration of human domination over nature, with notions of 'advancing'

into the future through mechanisation, intensification and economies of scale. **Referring to "iron rectangles" formed in the Global South between politicians, central bureaucratic agencies, private companies, and (international) developmental banks, they describe iron rectangles as "tightly associated in synergetic relationships" whereby "water flows created and modified by water infrastructure are intertwined with flows of power, manifest in political or financial benefits, whether private or collective".** They explain that Members of Legislative Assembly (MLAs) in India have strong incentives to perpetuate the 'supply orientation' of hydrocracies, in strong agreement with D'Souza's (2003) description of supply-side hydrology. MLAs engage in "competitive populism" where the objective is to display their ability as power brokers who can pressure central authorities into bringing irrigation projects to their constituencies.

However, MLAs acting as power brokers do not constitute equitable outcomes, since MLAs draw support from rich agricultural classes (and other powerful political lobbies), their brokerage creates greater marginalisation. This inequity in political relations translates to project designs that supply those who hold sufficient political leverage, thus conforming to the fractured contours of class, caste, and social inequalities. Molle et. al. (2009) go on to say that "[t]he hydraulic mission orientation is thus not just supported by water resources professionals' dispositions and private and institutional interests, but equally, if not more importantly so, by elected politicians as the construction activities associated with that 'mission' play a structural role in the reproduction of the political system."

Contending with how hydrocracies remain relevant and continue to channel power by exercising hydraulic control, **Molle et. al.** (2009) **describe the resistance of hydrocracies towards reform despite a changing world. Hydrocracies fight to retain their "command-and-control, construction orientation" while deflecting reform or by creating the illusion of radical change while altering very little.** By shifting costs to users, exploiting the push for privatisation, taking advantage of the difficulty in balancing competing interests over water use, and/or plainly "*diverting, neutralising and reconfiguring institutional reform efforts* [emphasis in original]", hydrocracies remain unchanged and maintain power in the larger network of water governance. The ILR

project, and the reconfiguration of the NWDA display these tendencies. While calling for further research on multiple dimensions of water governance, **Molle et. al. traced the flows of power between the four corners of India's iron rectangle while tracing the flows of power that surround the hydrocracy as an influential centre of power within a larger assemblage of actors.** The hydrocracy projects apolitical disguises onto hydraulic interventions while reflecting unequal social relations of the societies they claim to benefit equitably. This is achieved by pushing populist narratives that speaks of a "benefit to all" but in-effect creates highly political artefacts that reify existing socio-political relations.

Molle et. al., (2009) recognise options that can disturb hydrocracies and push progressive change, many of which derive from questions around environmental sustainability and ecological destruction. Those most relevant to India are noted here. **Firstly, environmental movements and international civil society at-large, has challenged the centralised project of the hydrocracy.** The WCD (ironically set up by the World Bank) is the most illustrative example of such a civil society challenge. **Secondly, decentralising power and control to smaller units of governance threatens the dominance of the hydrocracy over water flows and in turn the political agency that water affords.** Disagreements between the centre, states, and district governments over water sharing in India serve as potent examples of such decentralised federal competition, however these are usually not concerned with the failures of large projects in general. **Lastly, the financial squeeze faced by governments since the 1980s often as a part of structural reforms, has affected hydrocracies as well.** Smaller budgets have necessitated smaller goals, allowing for less construction and control. The hydrocracy in India is still large, and massive budgets have been allocated for the ILR. However, the realisation of the ILR still requires the government to remain committed to large and expensive infrastructural solutions toward populist policies.

The texts outlined here offer a quick look at the critical discourse surrounding hydrocracies and hydrocratic interventions. It is thus important to understand dams and canals not as universally democratic, depoliticised, and technoscientific inevitabilities but rather as manifestations of the pressures and interests of a larger system of social and political relations that exist within society. While their individual benefits could still be

argued for, with many who consider a nuanced implementation of dams to be part of healthy water infrastructure, the dominant hydrocratic paradigm does not consider this nuance of alternative perspectives, and focuses almost entirely on mega-infrastructural, supply-side, command-and-control hydraulic interventions. The ILR is a consequence of the same skewed valuations that are manifest in CBAs, exploiting and expropriating from the marginalised while perpetuating the dominant control of a network of powerful political actors. **The control over the flow of water is thus a political tool, which affords the controller substantial political currency, and when viewed through this perspective, the emergence and support for the interlinking scheme become easy to understand.** Their disregard towards other governance bodies and the judiciary, protecting the environment, and civil society criticism points to a system of impunity, where hydrocrats are not responsible for the people they displace, the ecosystems they destroy, or the public funds they misuse.

Attempts at reform from within the government have been seen, however, as described by Molle et. al. (2009), these efforts have been strongly resisted by the hydrocracy. In 2014, the then newly-elected BJP government had set up three committees, each dealing with reforming and restructuring India's ailing hydrocracy and regulatory institutions. While there seemed to be a genuine effort to include critical input from academics and civil society, the three reports published (*Draft National Water Framework Bill, 2016, Model Bill for the Conservation, Protection*, *Regulation and Management of Groundwater, 2016*, and *A 21st Century Institutional Architecture for India's Water Reforms*) were not accepted by the government (Joy & Janakarajan, 2020). The government has since then become increasingly tone-deaf to nearly all criticism, and has pushed the KBLP and ILR for political ends (like electioneering for the UP election).

Concluding Remarks

This report has looked to consolidate a dispersed literature on interlinking while contextualising it with relevant literature surrounding riverine ecology, displacement, and the hydrocracy at large. While there has been an attempt at highlighting the arguments of the government and related interlinking supporters, this report cannot in good conscience consider both sides of the issue to be equal. Arguments from various disciplines were highlighted, critiquing various aspects of the project and those responsible for it. On the whole, the hydrocracy has a lot to reform, with a large group of non-government voices offering viable alternatives and suggestions.

The NWDAs raison d'être of constructing interlinking projects is fundamentally flawed. The NWDA, along with much of the Indian hydrocracy, has shown disregard and ignorance towards ecological protections, all the while pushing a dangerous agenda unchecked, shrouded within dense and poorly-managed institutional jargon, looking to turn the public away from dissecting and critiquing the fundamental assumptions of the project. Owing to the lack of clarity within the hydrocracy itself, the hydrocracy can play it by the ear, shuttling projects that only seem to appease the reigning powers that be.

The institutionalised rules, norms, and behaviours that structured Indian water policy discourse since the 1950s are central to the hydrocracy today. Its concern for 'the people' is a well-intentioned mission – as all government projects, but its imagination, claims, and designs are plagued by age-old problems of archaic governmentality. The hydrocracy presents solutions as shiny-new ideas, which are in reality little more than old ideas rebranded, still fraught with the same irreversible blunders of before. It is disturbing to see that the "professionalised" bureaucracy of India, continues to deprive those who have been historically marginalised, despite being made cognisant of the damaging consequences of their dominant practices. The KBLP looks to transfer water from already water-scarce regions around the Ken, to a region of relative prosperity in Bhopal, Raisen, and Vidisha, while speaking to false promises of equitable water distribution. The Indian hydrocracy has transplanted many colonial-era water governance techniques and imposed a parochially self-serving structure – uncaring for those it leaves

out or condemns. The ILR is another attempt at resuscitating India's failing command-and-control supply-side hydrological paradigm, where the working parts of the ILR are identical to conventional forms of large-scale and permanent hydraulic interventions, only bundled together in one large scheme, mostly for convenient policy recommendation. This paradigm has been rightfully criticised multiple times, a glimpse of which was given in this report as well, and the hydrocracy needs to search for alternatives.

The KBLP and the ILR thus must be rejected, since there is absolutely no scope for improvement in projects so fundamentally disastrous. The robotic application of long-disproved hydraulic interventions has led to an immense anthropogenic strain on Indian rivers. Despite a blinkered hydrocracy that chooses to ignore dissent, it must be repeated once again; democratic, transparent and contextual interventions that engage with non-anthropocentric perspectives and prioritise those marginalised and affected most greatly by projects are critical for effective water governance, especially in response to the increasingly ominous challenges of climate change.

The lessons of the past all point to large-scale, state-sponsored interventions as damaging and disrupting, rather than conducive towards sustainable and just living. The changing climate, increasing economic inequity, and political polarisation will all strain human access to natural resources in unexpected and complex ways. In response to these uncertainties, archaic and problematic responses to human needs cannot be applied as traditional remedies, and a critical look at the system is necessary to create effective solutions towards water justice. It is the sincere hope of this report that the ILR is given a strong repudiation by not only the Supreme Court, but all those in positions of responsibility, and that the hydrocracy reconsiders its approach in line with a progressive and inclusive philosophy. The recommendations made to the government in 2014 are a great place to start, and should not to be viewed as rivalrous ideas that threaten good governance, but as suggestions towards better water futures.

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