

**TECHNOLOGY AND HYDROPOLITICS:  
A STUDY OF THE CENTRAL WATER COMMISSION  
IN INDIA**

*Thesis submitted to Jawaharlal Nehru University  
in partial fulfilment for award of the degree of*

**MASTER OF PHILOSOPHY**

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DECLARATION

I declare that the thesis entitled 'TECHNOLOGY AND HYDROPOLITICS: A STUDY OF THE CENTRAL WATER COMMISSION IN INDIA' submitted by me in partial fulfilment of the requirements for the degree of Master of Philosophy of Jawaharlal Nehru University is my own work. This thesis has not been submitted for any other degree of this university or any other university.

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CERTIFICATE

We recommend that this thesis be placed before the examiners for evaluation.

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## Introduction

*'Ever since Narcissus, we have tended to mistake water for something else- something other than ourselves'*

–Jamie Linton<sup>1</sup>

In the 20<sup>th</sup> century, large scale water resources development led by a hydraulic bureaucracy became a dominant feature. Anchored in 'modern' ideas about water, nature and technology, these bureaucracies became ubiquitous with the project of 'development'. Whether it was to feed teeming millions, 'modernise' villagers, or build stronger more 'democratic' states, the 'hydraulic mission'<sup>2</sup> was accepted across the globe and entrusted with hydrocracies. These hydrocracies (often powerful state water bureaucracies) have left an indelible impression on national economies and geographies — built 'modern temples' and constructed massive damming projects. The effects of these projects has been a mixed bag — while there has been an undeniable contribution to increased food and energy generation (albeit in the short term), environmental and social movements have increasingly challenged the rationale for these projects. In the last two centuries, the state has specifically pushed water resource development. Often times, this burgeoning exercise was an intentional political strategy to control space, society and nature<sup>3</sup>. A cadre of engineers, most frequently civil engineers, staffed these hydrocracies, leading them in building iconic

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<sup>1</sup> Jamie Linton, *What is Water: The History of a Modern Abstraction* (Vancouver and Toronto: University of British Columbia Press, 2010), 43.

<sup>2</sup> François Molle, Peter P. Mollinga and Phillipus Wester, "Hydraulic bureaucracies and the hydraulic mission: Flows of water, flows of power," *Water Alternatives* 2, No. 3(3009), 328-349.

<sup>3</sup> François Molle et al, "Hydraulic bureaucracies and the hydraulic mission," 328-349.

and symbolic projects. As seminal institutions driving modern economic development, the power and role of hydrocracies has seldom been the focus of academic research.

In the American West, author Marc Reisner remarks that investors who believed they would thrive on selling water to farmers eventually failed around the 1870s. Subsequent self-funded irrigation districts and companies also often ended up in bankruptcy. Beginning in the 20<sup>th</sup> century, the Bureau of Reclamation and the US Army Corps of Engineers set about controlling rivers through extensive systems of reservoirs across the US. In the four decades following the Second World War, large dams increased at an average of two every day (from 5,000 in 1950 to 45,000 in 2000)<sup>4</sup>. In the US, irrigation development was ‘pursued with near fanaticism, until the most gigantic dams were being built on the most minuscule foundations of economic rationality and need’<sup>5</sup>. In his detailed study of the Bureau of Reclamation, Reisner chronicles the collusion between business, politics and bureaucrats in the water sector. Specifically, he traces the growth and prosperity of the ‘iron triangle’ i.e. systems of vested interests that encourage bribery, bid-rigging, exchange of favours, or simply overestimation of benefits and neglect of costs in order to secure a steady flow of projects. In the US, the ‘iron triangle’, consisting of state politicians, federal agencies and private companies, has long been famous for blurring the frontier between private

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<sup>4</sup> Dams and Development: A New Framework for Decision-Making (The Report of the World Commission on Dams) (London and Sterling, VA: Earthscan Publications Ltd., November 2000)[http://wwf.panda.org/what\\_we\\_do/footprint/water/dams\\_initiative/dams/wcd/](http://wwf.panda.org/what_we_do/footprint/water/dams_initiative/dams/wcd/) (accessed 2 June 2011).

<sup>5</sup> Marc Reisner, *Cadillac Desert: The American West and its Disappearing Water* (New York: Penguin, 1986).

and public benefit. Projects were particularly fuelled by 'pork-barrel'<sup>6</sup> politics, often leading to the trading of votes between legislators pushing for their own project.

Through his book, Reisner attempted an unpacking of hydrocracy in the American West, and the means by which it gained momentum i.e. the 'iron triangle'. I contend that there is still a need to problematise the hydrocracy beyond the 'iron-triangle'. Specifically, there is a need to bring out the ways in which it builds seemingly stable narratives about the expert control of water and the imperative of modern water manipulation.

In sum, ideas about modern water and technology formed a template through which the hydrocracy — which in India took the form of the Central Water Commission — thought through, discussed and justified technological interventions. This seemingly stable template became a kind of bedrock for post independence engineering narratives for greater, scaled up technological interventions on riverine landscapes. Rivers came to be described in vacuum, without history, ecology and society. The hydrocracy draws upon and represents a certain bed of ideas and politics of power. Unpacking these ideas offers an epistemological entry point to understand how and why they work the way they do.

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<sup>6</sup> 'Pork-barrel politics' refers to the practice amongst members of the US Congress jostling for federal funds for big-money schemes in their home districts. The term 'pork-barrel politics' itself derives from the frenzy of hungry slaves on plantations in southern US, when their owners rolled out a barrel of salted pork to mark special occasions.



## Locating within Science Technology Studies

Science and Technology Studies (STS) is premised on the assumption that science and technology are thoroughly social activities<sup>7</sup>. One of the main concerns of STS is to explore and explain the ways in which scientists and engineers attempt to construct stable meanings. A central area of focus of STS and Social Construction of Technology (SCOT) is the supposed neutrality of technologies. Both STS and SCOT contextualise science and technology as social institutions that are affected by the distribution of resources and power both within and across societies and cultures.

According to Bruno Latour, *technoscience* describes 'all the elements tied to the scientific contents no matter how dirty, unexpected or foreign they seem'. Technoscience underscores the need to acknowledge that 'science and technology', is 'what is kept of technoscience' once all the trials of responsibility have been settled<sup>8</sup>. For Latour, 'technoscience implies a stage as well as a new stability; it is a stage within which science and technology are composed of many different kinds of elements (or actants)<sup>9</sup>. Latour mobilises the concept of the actant in the Actor Network Theory (ANT). ANT is distinct from the Strong Programme and the Social Construction of Knowledge (SSK). Latour criticises the Strong Programme for

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<sup>7</sup> According to Sergio Sismondo, science and technology 'are social in that scientists and engineers are always members of communities, trained into the practices of those communities and necessarily working within them. These communities set standards for inquiry and evaluate knowledge claims'. See Sergio Sismondo, *An Introduction to Science and Technology Studies* (United Kingdom: Blackwell Publishing, 2010, second edition), 10-11.

<sup>8</sup> For a detailed discussion see Bruno Latour, *Science in Action: How to Follow Scientists and Engineers through Society* (Boston: Harvard University Press, 1987), 29 and 174-175.

<sup>9</sup> Sal Restivo, "Bruno Latour: The Once and Future Philosopher," in George Ritzer and Jeffrey Stepinsky (eds), *The New Blackwell Companion to Major Social Theorists* (Blackwell: Blackwell forthcoming 2011), [www.salrestivo.org/LatourFinal.10.pdf](http://www.salrestivo.org/LatourFinal.10.pdf) (accessed 25 June 2011).

relying on Society to explain Nature<sup>10</sup>. According to Latour, the Strong Programme does not take into account the ways, in which non-social things and processes contribute to 'Society,' that is, to the social organisation of our lives. Unlike the Strong Programme, whose central goal is to explain not nature but 'shared beliefs about nature'<sup>11</sup>, Latour wants to interrogate everything: science, nature, society, causality etc.

### **Actor Network Theory (ANT) <sup>12</sup>**

ANT emerged in the 1980s from the work of Bruno Latour, Michel Callon, and John Law. ANT suggests that the work of science is not fundamentally different from other social activities. It doesn't privilege natural (realism) or cultural (social constructivism) accounts of scientific production; instead it asserts that science is a process of heterogeneous engineering in which the social, technical, conceptual, and textual are puzzled together (or juxtaposed) and transformed (or translated)<sup>13</sup>. To put it simply, ANT explores how relations between objects, people and concepts are formed rather why they are formed. According to Sergio Sismondo,

ANT represents technoscience as the creation of larger and stronger networks. Just as a political actor assembles alliances that allow him or her to maintain power, so do scientists and engineers. However, the actors of ANT are heterogeneous in that they include both human and

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<sup>10</sup> Sal Restivo, "Bruno Latour: The Once and Future Philosopher".

<sup>11</sup> David Bloor, "Anti-Latour," *Studies In History and Philosophy of Science* 30, Part A (March 1999), 87. ✓

<sup>12</sup> Based on George Ritzer (ed), *Encyclopedia of Social Theory: Volume II* (London, Thousand Oaks, New Delhi: Sage Publications Ltd., 2005), 1-3 and Sergio Sismondo, *An Introduction to Science and Technology Studies*, 81-92

<sup>13</sup> George Ritzer (ed), *Encyclopedia of Social Theory*, 1-3.

non-human entities, with no methodologically significant distinction between them. Both humans and non-humans form *associations*, linking with other actors to form networks. Both humans and non-humans have *interests* that cause them to act, that need to be accommodated, and that can be managed and used.<sup>14</sup>

ANT is premised on networks that are built and stabilised. Networks are built by actors. In the ANT schema, therefore, science and technology work 'by translating material actions and forces from one form into another'<sup>15</sup>. Indeed scientific representations 'are the result of material manipulations, and are solid precisely to the extent that they are mechanized'<sup>16</sup>. According to Sismondo, these networks,

[M]ight make machines function, when their components are made to act together to achieve a consistent effect. Or, they might turn beliefs into taken-for-granted facts, when their components are made to act as if they are in agreement. So working machines and accepted facts are the products of networks. The activity of technoscience, then, is the work of understanding the interests of a variety of actors, and *translating* those interests so that the actors work in agreement.<sup>17</sup>

In essence therefore, actors work with others to form a network. It must be remembered that actors while working with other actors can also serve as an

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<sup>14</sup> Sergio Sismondo, *An Introduction to Science and Technology Studies*, 81. ✓

<sup>15</sup> Sergio Sismondo, *An Introduction to Science and Technology Studies*, 82. — 2 b. 1

<sup>16</sup> Sergio Sismondo, *An Introduction to Science and Technology Studies*, 82. — 2 b. 1

<sup>17</sup> Michel Callon, "Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St. Brieuc Bay," in John Law (ed), *Power, Action and Belief* (London: Routledge & Kegan Paul, 1986), 196–233 and Michel Callon and John Law, "On the Construction of Sociotechnical Networks: Content and Context Revisited," in R. A. Jones, L. Hargens and A. Pickering (eds), *Knowledge and Society* 8 (1989), 57–83 as quoted in Sergio Sismondo, *An Introduction to Science and Technology Studies*, 82.

intermediary between actors. The form and attributes that actors have are dependent on their relations with other entities<sup>18</sup>. In ANT, actors and entities can be human and non-human, both of which are treated as equal stakeholders. According to George Ritzer, ANT advances three methodological principles: *agnosticism, generalised symmetry and free association*<sup>19</sup>. Agnosticism advocates abandoning any a priori assumptions of the nature of networks, causal conditions, or the accuracy of actant's accounts. According to Ritzer, 'ANT imposes impartiality and requires that all interpretations be unprivileged'<sup>20</sup>. The second principle is generalised symmetry i.e. a single explanatory frame when interpreting actants, human and nonhuman. Free association, which advocates abandoning any distinction between natural and social phenomenon. In ANT, there is no divide between local and global actors, or micro or macro actors. Networks are flexible and impermanent in that they can be only maintained through the efforts of the actor. Latour suggests that we should simply 'follow the actors'<sup>21</sup> whilst keeping an open mind as to which entities exist and to their importance and role in the network. ANT thus examines science in the making. Ritzer remarks that for ANT theorists,

[T]he 'success' of science is attributable to the ability of scientific networks: to force entities to pass through labs or clinics in order to harness 'scientific evidence' within disputes; to translate materials, actors, and texts into *inscriptions* that allow influence at a distance; and

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<sup>18</sup> John Law, "After ANT: Naming, Complexity and Topology," in John Law and John Hassard (eds), *Actor Network Theory and After* (Oxford: Blackwell Publishing, 1999), 3.

<sup>19</sup> George Ritzer (ed), *Encyclopedia of Social Theory*, 1-3. ✓

<sup>20</sup> George Ritzer (ed), *Encyclopedia of Social Theory*, 1-3. ✓

<sup>21</sup> Bruno Latour, Steeve Woolgar and Jonas Salk, *Laboratory Life: The Construction of Scientific Facts* (Princeton: Princeton University Press, 1993).

to organize as *centers of translation* where network elements are defined and controlled, and strategies for translation are developed and considered.<sup>22</sup>

Within all sociotechnical networks, disputes between actors result in relational effects — for instance as attempts at the advancement of a particular programme. This necessarily results in social asymmetry. ANT, can, therefore be also considered a

[T]heory of the mechanics of power: the stabilization and reproduction of some interactions at the behest of others, the construction and maintenance of network centers and peripheries, and the establishment of hegemony. Rather than power as possession, power is persuasion, “measured” via the number of entities networked. Power is generated in a relational and distributed manner as a consequence of *ordering struggles*.<sup>23</sup>

To put it simply, translation is a process of establishing identities, conditions of interaction, and characterizing representations. Thus network actants, as well as the relations that bind them, are translated as networks change. Translation, however, is always a process that involves simultaneous social and physical displacement. Network elements that ‘deviate from previous inclinations are converted to *inscriptions or immutable mobiles* (i.e. combinable textual, cartographic, or visual representations that remain stable through space and time), are defined and ascribed roles, and are mobilized and/or circulated through translation’<sup>24</sup>. Since order is provisional in a network, it must be continuously maintained. Networks, as a set of

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<sup>22</sup> George Ritzer (ed), *Encyclopedia of Social Theory*, 2.

<sup>23</sup> George Ritzer (ed), *Encyclopedia of Social Theory*, 2. Emphasis in original.

<sup>24</sup> George Ritzer (ed), *Encyclopedia of Social Theory*, 2.

dynamic alliances, are subject to possible desertion or competitor recruitment. Furthermore, 'the stability and stabilisation of a network, however temporary, involves the successful dismissal an *antiprogram* through prevailing in a *trial of strength*'<sup>25</sup>. Domination is inherently both contestable and reversible because, at any time, outside actants, may challenge or confront an advanced claim.

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### Looking back: The Central Water Commission

On October 11, 1974, a notification from the office of the President of India (Rashtrapati Bhawan notification no. CD-873/874 dated 11.10.1974) led to the clinging of a register somewhere deep in the Indian bureaucracy. There was finally 'an apex technical organisation in the field of water resources development'<sup>26</sup>. This organisation was called the Central Water Commission, an attached office 'of the Ministry of Irrigation, since renamed as the Ministry of Water Resources'<sup>27</sup>. The precedent was the bifurcation of the Ministry of Irrigation and Power through the order which resulted in the creation of 'Department of Irrigation' under the Ministry of Agriculture. According to the Commission's website, the

[I]t (the CWC) has attained its present distinctive place amongst the foremost technical and scientific organisations in the world through a process of gradual evolution conditioned by the growing importance for accelerated and optimum development and management of water

<sup>25</sup> George Ritzer (ed), *Encyclopedia of Social Theory*, 2.Emphasis in original.

<sup>26</sup> Central Water Commission, "Item - I: Particulars of its organisation, functions and duties," <http://cwc.gov.in/RTI-Item-1.htm> (accessed 20 February 2011).

<sup>27</sup> Central Water Commission, "Item - I: Particulars of its organisation, functions and duties".

resources and the purposeful contributions it has been making towards this end.<sup>28</sup>

This gradual evolution began nearly a century ago in 1923 when the then Government of India abolished the post of Inspector General of Irrigation and replaced it with the post of Consulting-Engineer-to-the-Government of India. With the constitution of the Central Board of Irrigation (henceforth CBI) in 1927, this post of Consulting Engineer too was abolished in 1932.

In the 1940s, there was a need felt to set up an organisation solely in charge of waterways — irrigation, navigation<sup>29</sup>. In 1945, the Central Waterways, Irrigation and Navigation Commission (henceforth CWINC) was formed (notified under Government of India vide Department of Labour Resolution No. DW 101(2), dated 5<sup>th</sup> April 1945). The commission was set up to:

[A]ct generally as a Central fact-finding, planning and coordinating organisation with the authority to undertake construction work. It will be available to advise the Central, Provincial and State governments in regard to waterways, Irrigation and Navigation problems throughout the country. The Commission was to be a strong technical organisation designed to conduct, where necessary, surveys and investigations with a view to secure planned utilisation of water resources of the country as a whole and, in consultation with the provincial and State governments throughout the country, to coordinate and press forward schemes for the conservation, control and regulation of water and

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<sup>28</sup> Central Water Commission, "Item - I: Particulars of its organisation, functions and duties".

<sup>29</sup> For a detailed discussion on the coming of the CWINC see Appendix I.

waterways and further, when so required by the Government of India, to undertake the execution of any such scheme.<sup>30</sup>

The CWINC was the first of the many organizations that finally mutated into making the Central Water Commission. At the time the CWINC was formed, there were parallel bodies. Even before the CWINC was formed, in November 1944, the GOI had constituted the Central Technical Power Board which was to take charge of 'initiating, co-ordinating and processing' schemes for power generation. To be precise, the GOI had decided,

[T]o constitute a Central Technical Power Board. This Board will act as a Central Planning Organisation. It will be available to advise the Central, Provincial and State Governments in regard to the universally accepted policy of encouraging, planning and pressing forward the widespread development of public electricity supply throughout the country. The Board will be a strong technical organization designed to collect ideas, conduct surveys, and prepare outline schemes for electrical development in consultation with Provincial and State Governments.<sup>31</sup>

Considering the gamut of functions the CWINC was dispensing, there was a considerable overlap. In the 1940s and 1950s, the GOI was in transition from a colonial regime to an independent regime. The labour department was succeeded by the Ministry of Works, Mines & Power. In January 1948 (vide Ministry of Works,

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<sup>30</sup> Central Water Commission, "Item - I: Particulars of its organisation, functions and duties".

<sup>31</sup> A.N. Khosla, "Central Water and Power Commission: April 1945 to April 1970," *Central Water & Power Commission (CWPC) Silver Jubilee Souvenir* (New Delhi: Ministry of Irrigation and Power, Government of India, 1970), 11.



Mines & Power resolution No. EL.1.201(1) and No. DW-XVI-1(1), both dated January 16, 1948),

[T]he Government of India reviews the position regarding the four organizations at present dealing with electricity and waterways development, viz., the Electrical Commissioner with the Government of India, the Central Technical Power Board, the Consulting Engineer, Waterways and Irrigation, and the Central Waterways, Irrigation and Navigation Commission,

and

[D]ecided to replace these four organizations by two organizations, namely the Central Electricity Commission and the Central Waterpower, Irrigation and Navigation Commission.<sup>32</sup>

The Central Electricity Commission and the Central Waterpower, Irrigation and Navigation Commission continued to function as separate entities till April 1951 when they were merged to form the Central Water & Power Commission (CW&PC). In this time, the Ministry of Works, Mines & Power had a successor: the Ministry of Natural Resources & Scientific Research. This ministry passed a resolution that,

The Commission (CW&PC) will be charged with the general responsibility of initiating, co-ordinating and furthering, in consultation with the State Governments concerned, schemes for the control, conservation and utilization of water resources, throughout the country, for purposes of flood control, irrigation, navigation and waterpower generation, as well as schemes of thermal power

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<sup>32</sup> A.N. Khosla, "Central Water and Power Commission," 11.

development and also schemes of transmission and utilisation of electric energy throughout the country. The Commission will, if so required, also undertake the construction and execution of any such schemes.<sup>33</sup>

In 1952, the Ministry of Irrigation and Power was created and under its aegis, the Central Water & Power Research Station at Khadakvasla (Pune) and the Central Soil Mechanics Research Station (Delhi) were added to the CW&PC in 1954. In 1960, the Power Research Institute (Bangalore) became a part of the CW&PC.

In the last century the hydrocracy has enjoyed many names and functions. In its post colonial form, the hydrocracy moved through many government institutions before being coalesced together as the CWC. This long history has been chronicled to contextualise the post colonial impulse in its colonial roots.

#### **ANT and Hydrocracies:**

As a mode of analysis, ANT opens up many possibilities for hydrocracies that have been hitherto unexplored. Seen as a network that merits analysis, hydrocracies appear as dynamically arranged and vulnerable. The hydrocracy thus appears as a network of actors, made to act in certain, specific ways. Through its three chapters, this MPhil seeks to follow this network, to point out how hydrocracies are able to build and sustain themselves. Following the network, will allow us to understand how the network was formed and its interconnectedness. Since networks are not asocial or ahistorical, this network is deeply situated and is a product of socio-political processes. As the previous section showed, networks are contingent and are premised

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<sup>33</sup> A.N. Khosla, "Central Water and Power Commission," 11.

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on a need to survive. As actors change, so do networks. Consisting of both human and non human actors, this network is particularly interesting for its stability.

As mentioned earlier, hydrocracies have been questioned based on the economic, social or environmental impacts of their projects. Hydrocracies have been increasingly challenged internally — within the state bureaucracies or through political changes — and externally — by critiques from civil society and academia, or by reduced funding. However, I contend that they are wired in such a way that they can't incorporate the critiques. Therefore they don't. Instead they find ways to work themselves out of critiques by either deligitmising them, or not engaging with them.

The network under analysis here consists of the human actors (i.e. engineers, water bureaucrats) who act together with non human actors in the form of dams and weirs (i.e. physical infrastructure on riverine landscapes and other non human actors in the form of narratives). Human and non human actors come together to create what seemed like a stable network. As non human actors with equal agency, physical actors such as dams and bunds can create their own politics. The chapters below are arranged to bring out how this network was formed and the reasons for its stability.

Chapter one begins with an attempt at unpacking the large dam in novel ways. The large dam has often been seen as political artifact; an instrument that propagates social inequality as well as an environmental problem. There has however been little treatment of the thick bed of ideas that the dam dream draws upon. The hydrocracy in India, I argue, has not been subjected to the same kind of investigation as the dam itself. In its engagement of ideas, this chapter attempts at moving beyond vested interests and their effects. Instead, recalling Latour's directive on the importance of

investigating the process of assembly just as much as probable outcomes, this chapter attempts just that. In doing so, it examines how ideas of modern water, expert control and national place, among others, are stitched together to yield a hydraulic bureaucracy.

The second chapter uses engineering narratives to understand how the technocracy orders rivers <sup>to</sup> uniform flows through four principle arguments. These four arguments anticipate a distinctive 'national space for development'; the need for indigenous, exportable expertise in dam building; underscore the need for large scale technological interventions on riverine landscapes; justify basin wise development of rivers to yield maximum returns. In their technocratic embedding, these arguments also are avowedly apolitical and asocial. In a sense, these four principles are a means to organise arguments for self perpetuation. The first rationale fixes the nation state as the object of development through a long history of hydraulic manipulation. This contiguous history of water resource development, I argue, disembeds place and instead anticipates a national space for development. The second rationale drives indigenous expertise in dam building to increase self reliance. Engineering narrative observed that such expertise would reduce the need to look westwards whilst also becoming exportable to other countries. The third rationale is a neo-Malthusian trap of over population, underproduction and imminent scarcity; the only out was to maximise the scale of interventions on riverine landscapes. Drawing upon the third rationale, the fourth rationale, called for basin-wide development of rivers. It was argued that basin wise (and basin wide) development, was the only way to ensure rivers did not run to 'waste'. Being constituted of and through these rationales, rivers

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The third chapter looks for grey areas in the impressive claims of the technocracy. Specifically, this chapter draws attention to the fact that the tall claims are not internally coherent in that there were voices of discord amongst the engineering community. There was also incessant external questioning by civil society and activist groups, bringing to fore how the hydrocracy couldn't always substantiate its claims as triumphantly as it made them. However, due to its unique wiring, the hydrocracy cannot address these questions nor incorporate critiques.

These three chapters explore different aspects of the hydrocracy: through the organisation of expertise; narratives legitimizing interventions for water control and as knowledge regimes.

Very  
conclusive

## Chapter I

### Controlling flows to expert control: Modern water, nation and development

*'Man always aspires higher but water flows to the lowest point'*

- Chinese proverb.

Large dams hold up water. They cut off rivers from their flood plains and fish from spawning grounds. The history of large dams has often been presented as a story of technological triumph: controlling flows, 'taming rivers'. As technological artefacts, dams were meant to fundamentally rearrange natural and social geographies, and alter the distribution of resources across space and time. Offering more than just a promise of agricultural development or technical progress, for many post colonial governments, dams became 'the means to demonstrate the strength of the modern state as a techno-economic power<sup>1</sup>. Dams and their effects on communities' — both human and non-human — were, however, often not fully understood until recently. If they were understood after construction, they often were brushed aside<sup>2</sup>.

Current conventional scholarship has argued that a dam is a political artefact<sup>3</sup>. Environmental historians have seen the colonial agenda of reconfiguring social and natural environments in terms of imperatives of ruling, and of imposing Western

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<sup>1</sup> Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley: University of California Press, 2002).

<sup>2</sup> Richard White, *The Organic Machine* (New York: Hill and Wang, 1995); Marc Reisner, *Cadillac Desert: The American West and its Disappearing Water* (New York: Penguin, 1986).

<sup>3</sup> See Rohan D'Souza, *Drowned and Dammed: Colonial Capitalism and Flood Control in Eastern India* (New Delhi: Oxford University Press, 2006); Arundhati Roy, *The Cost of Living* (Modern Library, 1999).

sensibilities on nature. Scholars such as Rohan D'Souza<sup>4</sup> have sought to recast dams as structures deeply entrenched in political processes. Through an assessment of flood control in colonial Orissa, he argues that capitalism, as a specific social form, with its assemblage of practices, has a unique and devastating ecological impact. He contends that ecological interventions are anything but benign conquests of nature; instead they correspond to the precise social form and the distinct political economies at play. Capitalism therefore fundamentally recasts its relationship with nature through its extractive processes and the ensemble of ecological practices that it unfurls can only be explained through dynamics peculiar to its political economy.

In his study of the Damodar Valley Corporation (henceforth DVC) in India, Daniel Klingensmith<sup>5</sup> offers fresh insight into the genesis of dam-building in India. Specifically, he traces how this process was influenced by the developmentalist model of multi-purpose river valley projects in the United States during the 1920s and '30s. Comparing the Tennessee Valley Authority (henceforth TVA) and the DVC, he reflects on how these technological marvels, built on the notion of modernization and technological neutrality, became symbols of progress, democracy, freedom and nationalism and entered the popular imagination of the people as 'democracy on the march'. Novelist and social commentator Arundhati Roy in *The Cost of Living* examines the socio-human costs extracted by India's 'modern-temples'. Roy argues that instead of bringing their purported returns, dams are instead deployed by the Indian state as weapons to disrupt social and agrarian rhythms in the name of development. In moving beyond the Nehru vs. Gandhi debate on development, Roy

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<sup>4</sup> See Rohan D'Souza, *Drowned and Dammed*.

<sup>5</sup> See Daniel Klingensmith, *One Valley and a Thousand: Dams, Nationalism and Development* (New Delhi: Oxford University Press, 2007).

points to one of the core issues of development. She argues that development always involves choices. In the particular case of the Narmada, Roy argues the villagers lose everything while the beneficiaries are far away in the cities and in the government. 'India doesn't live in her villages. India dies in her villages.'<sup>6</sup> Roy also questions whether the dam will even deliver the benefits promised by the government. More importantly however, embedded in her story of dams and development is also a story of India's democracy. To Roy, projects like the Sardar Sarovar dam take power away from the people and put it in the hands of a single authority who will decide who gets what water when, essentially the power of life and death. India's democracy, for Roy, is 'the benevolent mask behind which a pestilence flourishes unchallenged'.<sup>7</sup>

Activists such as Shripad Dharmadhikary have, on the other hand, tended to stick to a critique of large dams using Cost-Benefit Analysis. In his report, *Unravelling Bhakra: Assessing the Temple of Resurgent India*<sup>8</sup>, Dharmadhikary contends that the spectacular growth in food grain production in Punjab and Haryana can be attributed to the Bhakra project only to a limited extent. Building up his case using data from the dam itself, Dharmadhikary dispels the many benefits the Bhakra dam supposedly yielded in Punjab and Haryana. Political Scientist, Satyajit Singh in *Taming the Waters* builds up a long and sustained case for the inefficiency of large dams in India. Based on government data, Singh, through his detailed analysis seeks to explain the provenance of large dams in new light using the political economy approach.

<sup>6</sup>Arundhati Roy, "The Greater Common Good," in *The Cost of Living*, <http://www.narmada.org/gcg/gcg.html> (accessed 15 July 2011).

<sup>7</sup>Arundhati Roy, "The Greater Common Good".

<sup>8</sup>Arundhati Roy, *The Cost of Living*.



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Recent scholarship has also pointed out that large dams cause massive environmental damage. In his detailed and comprehensive study of large dams and their effects, Patrick McCully<sup>9</sup> has painstakingly pointed out that large dams seldom keep up any of their promises. Instead they increase vulnerability to earthquakes, reduce biodiversity in rivers as well degrade river ecology. Large dams have also been portrayed as socially unequal: displacing millions of people in the past few decades. Displaced peoples have often not been rehabilitated. In cases such as Bhakra, displaced villagers continue to seek rehabilitation, nearly six decades later<sup>10</sup>.

The large dam has thus been investigated as a political artefact, and an intervention that has bred unequal social outcomes. However, in this chapter, I will argue that a large dam rests upon a thick bed of ideas that have been problematically stitched together. In essence, it attempts to unpack the ideas that have come to constitute the idea of a large dam. Large dams I contend are technological artefacts that are ideologically wired to enable politics. A large dam represents a unique understanding and superiority of technology over nature. This understanding itself has deep philosophical and historical roots. A genealogy of the large dam would reveal the many political, technological machinations that went into its making.

However, grasping the idea of the large dam as a product of a larger technical bureaucracy has not been explained. Centralised water bureaucracies are fundamentally sustained by a belief in ‘modern’<sup>11</sup> water: as an apolitical and,

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<sup>9</sup> Patrick McCully, *Silenced Rivers: The Ecology and Politics of Large Dams* (London: Zed Books, 2001, enlarged and updated edition).

<sup>10</sup> Shripad Dharmadhikary, Swati Sheshadri and Rehmat, *Unravelling Bhakra: Assessing the Temple of Resurgent India* (Badwani, Madhya Pradesh: Manthan Adyayan Kendra, 2005).

<sup>11</sup> By modern water, Linton means water as an objective, homogenous, ahistorical entity is complimented by its physical containment and isolation from people and reinforced by modern techniques of management that have enabled many of us to survive without having to

ahistorical quantity. Water as disembedded from place. This bureaucracy has in the last six decades maintained a firm control over water and water resource development issues in India. The story of its assemblage will open the terrain to alternative histories that constantly unpack the neat hagiographies that we have thus far inherited.

This chapter begins with Langdon Winner and his investigation of technological artefacts that have political outcomes. Bruno Latour's critique of Winner however, forms the bedrock of the chapter. In his critique Latour argues that instead of the outcome, investigating the process itself might have open more analytical possibilities. Drawing upon Winner and Latour, the chapter then discusses the problematization of technology by scholars such as Martin Heidegger, specifically drawing upon Heidegger's useful framework to understand how nature is dehistoricised in the modern imagination. His notion of standing reserve, specifically the means by which modern science reorders time and space in particular ways has consequences. Nature came to be ordered as a 'standing reserve'<sup>12</sup> that can be engineered for profit.

In investigating the process, I discuss modernity, specifically the problem of time-space distancing. Scholars have pointed out that in flattening time and place, modernity allowed a singular notion of time that was removed from place. In standardising time and time-keeping practices, modernity helped rewire the world into a singularity like never before; casting nature instrumentally. The instrumental reordering of nature as a problem of technology/science rather than a larger social or

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think much about it. For a longer discussion see Jamie Linton, *What is Water: A History of a Modern Abstraction* (Vancouver and Toronto: University of British Columbia Press, 2010), 19.

<sup>12</sup> Martin Heidegger, *The Question Concerning Technology and Other Essays*, trans. William Lovitt (New York: Harper & Row, 1977, first published 1953), 1-17.

political problem was seminal to the later ‘technical’ project of development. The consequences of modernity especially for the way nature is imagined are many and complex.

Jamie Linton in his study of the instrumentality of water builds on the multifaceted effects of modernity on water. Linton uses the example of the hydrological cycle to suggest that modern water became amenable to expert control and national plans for water resource development. These detailed plans were the very public face of an elaborate and unified plan for complete water resources control across the country. In their elaborateness, these plans are indicative of the larger plan for development.

This chapter argues that the assemblage of ideas that make modern water and expert control so amenable need to be investigated. In other words, large dams need to be understood as technological artefacts that are ideologically constituted. Most of all, the chapter claims that it is the coming together of modern water and expert control that helped craft the idea of the large dam in the first place.

### **Constructing the Artefact**

In his seminal article, ‘Do Artifacts Have Politics?’ philosopher Langdon Winner argued that technologies embody social relations i.e. power. Winner identified two principle ways in which artefacts have politics. The first, involving technical arrangements and social order, concerns how the invention, design, or arrangement of artefacts or the larger system becomes a mechanism for settling the affairs of a community. This way ‘transcends the simple categories of “intended” and “unintended” altogether, representing, ‘instances in which the very process of

technical development is so thoroughly biased in a particular direction that it regularly produces results'<sup>13</sup>. It thus implies that the process of technological development is critical in determining the politics of an artefact; hence the importance of incorporating all stakeholders in it. The second way in which artefacts can have politics refers to artefacts that correlate with particular kinds of political relationships, which Winner refers to as inherently political artefacts. Winner distinguishes between two types of inherently political artefacts: those that require a particular sociological system and those that are strongly compatible with a particular sociological system. A further distinction is made between conditions internal to the workings of a given technical system and those that are external to it<sup>14</sup>.

Responding to Winner more than two decades later, philosopher Bruno Latour comments that 'to say that our ordinary course of action is intermingled with artifacts does not mean that they have politics — at least, not yet', further posing the question, '[D]oes politics begin when the irreversible built in techniques are taken into account?'<sup>15</sup> Detecting politics is always tricky because 'of the exact opposite of what is implied by Winner's argument' i.e. technology, 'has its own intent and import which makes the best (or the worst of intent) drift away'. Thus Latour says,

[I]f artifacts do more than "objectifying" some earlier political scheme, if their design is full of unexpected consequences, if their durability means that all the original ideas their designers entertained about them

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<sup>13</sup> Langdon Winner, "Do Artifacts have Politics?," reprinted in Donald Mackenzie and Judy Wacjman (eds), *The Social Shaping of Technology* (London: Open University Press, second edition, 1999), 25-6.

<sup>14</sup> Langdon Winner, "Do Artifacts Have Politics," 29-30.

<sup>15</sup> Bruno Latour, "Which politics for which artifacts?," *Domus* (June 2004), [http://www.bruno-latour.fr/presse/presse\\_art/GB-06%20DOMUS%2006-04.html](http://www.bruno-latour.fr/presse/presse_art/GB-06%20DOMUS%2006-04.html) (accessed 20 February 2011).

will have drifted in a few decades, if, in addition, they do much more than carrying out power and domination and are also offering permissions, possibilities, affordances, it means that they are doing politics in a way not anticipated by Langdon Winner's seminal article. In other words, they have to be “represented”; they are a material assemblage in dire need of an assembly.<sup>16</sup>

In his article, Langdon Winner uses the example of architect Robert Moses in the early 20<sup>th</sup> century designing low bridges in order to keep trucks off New York's beaches. Latour contends that Moses' intent of keeping buses and trucks off beaches and recreational parks was explicit enough. It would however be questionable, if the move was simultaneously seen as keeping to keep blacks off beaches and parks as well (since most blacks at the time were not rich enough to buy cars that would bring them to these beaches and parks) — a conclusion that Winner draws.

To read discrimination against blacks into a bridge is not doing politics. It's simply doing architectural critique and the most innocuous at that, namely the one that sees artifacts as simply ‘embodying’ some type of oppression.

Indeed Latour says,

Has Robert Moses discriminated against trucks? Surely, this was explicit in all the plans and this is why he made the bridges so low retaining the normal height for the other expressways: trucks had no truck going to the beaches. But has he discriminated against buses ‘full of blacks’? This is pure ideology, that of the social critique: to separate

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<sup>16</sup>Bruno Latour, “Which Politics for Which Artifacts?”.

parkways from expressways is not the same as to keep whites and blacks apart. To jump too fast from one to the other is indulging into some sort of conspiracy theory.<sup>17</sup>

To read design as intent on keeping buses and trucks off beaches as well as being racist might not be entirely accurate in its account of the motivations of the design. Artefacts afford possibilities that are beyond the framework of consequences anticipated by Winner. Latour views Winner's arguments of artefacts having politics as denying the possibilities for that very politics. If wired a certain way, artefacts will produce results that would be anticipated by Winner's paradigm as well those that go beyond. Latour argues that there is a need to understand artefacts for themselves; the many machinations that went into bringing those artefacts to reality. In other words, Winner's argument is turned on its head; the process of assembly is investigated more than the probable outcomes. Thus, seen in the Latourian schema, technological artefacts do more than just what is expected of them. They are not static objects that can be simply programmed into specific ends; over time they are able to generate their own politics to produce results-both anticipated and unanticipated. Thus when seen as assemblages that represent various stakeholders and their machinations, artefacts open up an entire new set of analytical categories and themes. Seen in this light a large dam needs to be studied as more than an outcome of vested interests. Vested interests, like political and social context are all factors that could be powerful stakeholders in the making of a large dam.

In his analysis of dams, weirs and anicuts, Science Technology Studies scholar Wiebe Bijker remarks that technological artefacts such as anicuts, dams, and weirs

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<sup>17</sup> Bruno Latour, "Which Politics for Which Artifacts?"

were all innovations when they were first constructed. Over time however, they become standard practice. Bijker claims that they grow hard and obdurate, difficult to change and may 'even stand in the way of innovation'<sup>18</sup>. According to Bijker, when things stabilise and grow obdurate, stable ways of thinking and fixed patterns of interactions do emerge which he calls 'technological frames'. Bijker proposes the concept of 'technological frame' to explain the development of heterogeneous socio-technical ensembles. A technological frame structures the interactions between the actors of a relevant social group. A technological frame is built up when interaction 'around' a technology starts and continues. Existing practice does guide future practice, though it may not be entirely deterministic. The concept of 'technological frame' forms a hinge in the analysis of socio-technical ensembles: it sets the way in which technology influences interaction and thus shapes specific cultures, but it also explains how a new technology is constructed by a combination of enabling and constraining interactions within relevant social groups in a specific way. Labelling dams and anicuts as technological frames, Bijker says that people with

[A] high inclusion in such a technological frame will find it difficult to imagine other ways of dealing with the world; of using these things radically differently or even not using them at all<sup>19</sup>.

Seen as a technological frame thus, a large dam can be seen as an artefact that is wired to and represents a particular kind of politics. The water bureaucracy, for instance, would be one of the actors, with a high inclusion in the technological frame. Recognising that things 'are thick with politics' draws attention 'to the crucial relation

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<sup>18</sup> Wiebe Bijker, "Dikes and Dams, Thick with Politics," *Isis* 98, No.1 (March 2007), 122. ✓

<sup>19</sup> Wiebe Bijker, "Dikes and Dams, Thick with Politics," 122.

of things to people'<sup>20</sup>. Seen in this light, dams are anything but apolitical structures meant to spearhead overall social and economic development.

To recognise that a large dam is thick with politics opens analytical possibilities that have already been explored by scholarship. Unpacking the ideas that lock together to form the artifice of the large dam, I contend, will reveal great analytical possibilities to investigate the water bureaucracy. The section below will attempt this unlocking, walking the reader through various ideas that lock the large dam in place.

### **Revealing technology**

The German philosopher Martin Heidegger contended that the 'essence of technology is by no means anything technological'<sup>21</sup>. According to Heidegger, modern technology is a mode of revealing. Being, manifests itself within it<sup>22</sup>. William Lovitt, in his translation of Heidegger contends that for Heidegger, in its essence, modern technology is a 'challenging revealing'; for it 'sets upon' everything, imposing upon it a demand that seizes and requisitions it for use. Nothing is allowed to appear as it is in itself; the fulfilment of such a revealing is achieved when, as is the case in our times, objects are not regarded for themselves but instead for their readiness for use becomes their most important quality. Lovitt adds that today,

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<sup>20</sup> Wiebe Bijker, "Dikes and Dams, Thick with Politics," 123.

<sup>21</sup> Martin Heidegger, *The Question Concerning Technology and Other Essays*, trans. William Lovitt, (New York: Harper & Row, 1977, first published 1953), p 4.

<sup>22</sup> According to William Lovitt, for Heidegger 'Being may perhaps best be said to be the ongoing manner in which everything that is, presences; i.e. it is the manner in which in the lastingness of time, everything encounters man and comes to appearance through the openness that man provides'. See Martin Heidegger, *The Question Concerning Technology*, xv.



[A]ll things are being swept together into a vast network in which their ~~only in which~~ their only meaning lies in their being available to serve some end that will itself also be directed toward getting everything under control. Heidegger calls this fundamentally undifferentiated supply of the available the 'standing-reserve'<sup>23</sup>.

Thus according to Heidegger, when man, 'investigating, observing, pursues nature as an area of his own conceiving, he has already been claimed by a way of revealing that challenges him to approach nature as an object of research, until even the object disappears into the objectlessness of standing-reserve'.<sup>24</sup>

Commenting on Heidegger, Neil Turnbull says that, 'Heidegger viewed technology as an ontological process of "ontic ordering" — das *Gestell* — that reveals an ordered world of interlocking objects that stand over and against the modern self-willing subject as "ready and available for use"<sup>25</sup>. The 'truth of technology' thus is a fundamental ordering of the world that views everything as a slave of plans, designs, projects. In such a world, truth is inseparable from 'objectivity' which itself is a function of mathematized utility. Turnbull further comments that Heidegger's central argument is that in the age of modern technology 'truth', on one level, becomes reduced to 'technical correctness' but that such ideas of technical correctness conceal the ontological condition of pre-representational activity — what might be usefully

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<sup>23</sup> Martin Heidegger, *The Question Concerning Technology*, trans. William Lovitt, xxix.

<sup>24</sup> Martin Heidegger, *The Question Concerning Technology*, trans. William Lovitt, 17.

<sup>25</sup> Neil Turnbull, "Heidegger and Jünger on the 'significance of the century': technology as a theme in conservative thought", *Writing Technologies* 2, no 2 (2009), 19-20, [http://ntu.ac.uk/writing\\_technologies/current\\_journal/86047.pdf](http://ntu.ac.uk/writing_technologies/current_journal/86047.pdf) (accessed 22 February 2011).

termed ‘the work of technics’ — through which such modes of understanding are disclosed and maintained. Thus, mathematics and utility become the two categories that effectively disguise the deeper ontological truth of technology. According to Turnbull, they become its ‘historical symptoms’. Heidegger, he remarks, argued for a conception of technology as an ontological process that ‘worlds the world’ as something ordered, calculable and useful, and as such it must be understood as a form of ‘ontological authority’ — as ‘a revealing that orders’. The forgetting of this deeper ontological dimension of modern technics, according to Heidegger, leads to the modern subject’s acceptance of his/her ensnarement in the representational truths of science that conceive of the world as mere beings. In the Heideggarian schema, ‘technology’ is no longer perceived ‘in the midst’ of technologically produced and conditioned things but is rather seen ‘as a whole’; as an ontological condition that discloses a new human ecology, a ‘*technosphere*’<sup>26</sup>, that must be understood phenomenologically ‘*as world*’<sup>27</sup>. Technology thus, shapes the ways in which reality comes to be perceived in terms of calculable and discrete units. This enflaming is used in modern science to understand and order the larger world: ‘[B]ecause the essence of modern technology lies in Enframing modern technology must employ exact physical science’<sup>28</sup>. Modern technology thus shapes the ways in which space and time are experienced.

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<sup>26</sup> Neil Turnbull, “Heidegger and Jünger,” 21. Emphasis in original.

<sup>27</sup> Neil Turnbull, “Heidegger and Jünger,” 21. Emphasis in original.

<sup>28</sup> Martin Heidegger, *The Question Concerning Technology*, 22.

## Technology and nature

The ordering of nature instrumentally ensures that all of nature is composed of standing reserves. In shaping the ways in which space and time are perceived, modern technology thus marks a radical shift in the way nature is conceived. The possibilities for such a nature are concomitantly very different. Arguments for a rational, return based nature easily fall under the purview of such a conception.

Noel Castree and Bruce Braun in *Remaking Reality: Nature at the Millennium* remark that through his writings, Heidegger points out how modernity ensures human knowing becomes dehistoricised. In placing a transcendental human consciousness at the centre, human temporality becomes erased, dehistoricising human knowing and the 'order' of the world is seen as something 'discovered' rather than something that itself requires explanation. In modernity, Heidegger argues the historical specificity of how things are 'given' to human subjects recedes and becomes the 'invisible shadow that is cast around all things everywhere'<sup>29</sup>. This shadow allows the modern world to extend itself out to a space withdrawn from representation, and thus lends to the 'incalculable the determinateness peculiar to it, as well as a historical uniqueness'<sup>30</sup>. Representation, as Heidegger clarified, involved both 'unconcealment' (bringing things into presence) and 'concealment' (excluding other possible appearances). Castree and Braun tie up this notion of representation with Foucault's notion of invisibility i.e. what was 'visible' at any specific conjuncture was related to the

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<sup>29</sup> Bruce Braun and Noel Castree, "The Construction of nature and the nature of construction: analytical and political tools for building survivable futures," in Bruce Braun and Noel Castree (eds), *Remaking Reality: Nature at the Millennium* (London: Routledge, 2005, first published 1998), 17.

<sup>30</sup> Bruce Braun and Noel Castree, "The Construction of nature and the nature of construction," 17.

production of ‘spaces of visibility,’ which necessarily also involved producing ‘spaces of invisibility’<sup>31</sup>. In short, they argue, nature — like all objects — is an entity which ‘shows up’ within the world, but only in certain ways and not others. It was precisely forgetting this that gave to modern representation the character of *gestell* — a ‘stamping’ — whereby representation took on a normalising function, fixing identities as immutable<sup>32</sup>. To Castree and Braun,

Heidegger characterized modernity as carrying with it its own unexamined theology which obscured the ways in which things were given to subjects and the relations of power that necessarily infused all identities.<sup>33</sup>

Such an account of nature, Castree and Braun contend places attention firmly on the operation of power and widen what is taken to be the domain of politics. Using Foucault, they argue that, because power is not held,’ but is ‘diffuse’ — it operates unannounced in myriad social practices, including those we take as ‘merely’ discursive.

Indeed, it is precisely because we mistake our ordering of appearances for the world itself, unaware of how our knowledges reflect their social context, that power relations become naturalized in our representations of nature.<sup>34</sup>

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<sup>31</sup>Bruce Braun and Noel Castree, “The Construction of nature and the nature of construction,” 17. Emphasis in original.

<sup>32</sup>Bruce Braun and Noel Castree, “The Construction of nature and the nature of construction,” 18.

<sup>33</sup>Bruce Braun and Noel Castree, “The Construction of nature and the nature of construction,” 17

<sup>34</sup>Bruce Braun and Noel Castree, “The Construction of nature and the nature of construction,” 18

Therefore, they argue that, the significance of representational practices, ‘lies not only in that they disclose a “world,” but that representation is a worldly practice’. Thus, the representational practices are at the same time the material as they themselves materialise i.e. they are deeply embedded in social — and ecological — relations at the same time as they render ‘society’ and ‘nature’ intelligible. They conclude that,

Heidegger’s anti-foundationalism provides an alternative to those modern subject-centered epistemologies in which the truthfulness and certainty of knowledge claims involved setting aside presuppositions (getting clear of our historical “situatedness”). Knowledge—including our knowledge of nature—is always social and historical and this has implications for the claims we make about nature. Indeed, configurations of specific social, institutional and technological practices are precisely what enable us to build our accounts of the world.<sup>35</sup>

Technologies that manipulate nature thus, do more than disciplining it: they order imaginations about nature. Unpacking these technologies concomitantly, will reveal the specific political, historical practices that configured nature in specific ways. Revealing technologies thus will reveal their effects and social contexts.

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<sup>35</sup> Bruce Braun and Noel Castree, “The Construction of nature and the nature of construction,” 19.

## Modernity and the disembedding of place

‘Place’ is a central theme in alternate narratives of nature/s and people/s, especially pre-modern narratives. Place as understood by these narratives is socially constructed and propagated. Social relations intertwine in such a notion of place. Place is thus socially embedded and reflects and embodies extant social relations. Narratives, especially pre-modern ones possessed modes of calculation of time — the local calendar for instance was a distinct feature of agrarian societies — that was always linked to place. In his study of modernity, Anthony Giddens remarks that it was impossible to tell the time of day without reference to other socio-spatial markers: ‘when’ was almost universally either connected with ‘where’ or identified by regular natural occurrences. The notion of time was still connected ‘with space (and place) until the uniformity of time measurement by the mechanical clock was matched by uniformity in the social organization of time’— a shift finally achieved only in the 19<sup>th</sup> century. He remarks that the coming of the mechanical clock and its dissemination further aided the separation of time and space. Further, the standardizing of time across regions, led to the ‘emptying of time’<sup>36</sup>. This ‘emptying of time’ is in large part the precondition for the ‘emptying of space’, for coordination across time is the basis of the control of space. The development of ‘empty space’ thus may be understood in terms of the separation of space from place<sup>37</sup>.

In pre-modern societies, notions of space and place coincided largely because social life, was, for the most part spatialised through local activities. Notions of space

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<sup>36</sup> Anthony Giddens, *The Consequences of Modernity* (Oxford: Polity Press, 1990), 22.

<sup>37</sup> It is important to stress the distinction between these two notions, because they are often used as more or less synonymous with one another. ‘Place’ is best conceptualized by means of the idea of locale, which refers to the physical settings of social activity as situated geographically’. See Anthony Giddens, *The Consequences of Modernity*, 22.

and place could not be extracted from one another. The coming of modernity however changed that. As more of the world was mapped and explored, space became an independent entity. As geographers strove to develop 'scales' predictable over landscapes histories, the notion of space became capable of being represented without any locality. Giddens argues that the time-space distanciation is of vital importance for modernity, because it is the precondition of disembedding. Giddens defines disembedding as 'the "lifting out" of social relations from local contexts of interaction and their restructuring across indefinite spans of time-space'<sup>38</sup>. More importantly, Giddens distinguishes between two types of disembedding mechanisms intrinsically involved in the development of modern social institutions: symbolic tokens and expert systems. The former are media of interchange which change hands without the specific regard to participants of the interchange, such as money. The latter are systems of technical accomplishment or professional expertise which organise a large part of our physical and material world<sup>39</sup>. According to Giddens, although most people are rarely brought in direct contact with experts themselves, the systems in which the knowledge of experts is integrated, influence the many aspects of everyday lives. Expert systems, he says, are disembedding mechanisms because they remove social relations from the immediacies of context. An expert system, like symbolic tokens, disembeds by providing 'guarantees' of expectations across distanciated time-space. This 'stretching' of social systems, Giddens says, is achieved via the impersonal nature of tests applied to evaluate technical knowledge and by public

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<sup>38</sup> Anthony Giddens, *The Consequences of Modernity*, 21.

<sup>39</sup> Anthony Giddens, *The Consequences of Modernity*, 27.

critique (upon which the production of technical knowledge is based), used to control its form<sup>40</sup>.

In societies such as India, the coming of modernity is inextricably tied to colonialism. Looking specifically at colonial India, D'Souza has pointed out that colonialism offered a radical break in hydraulic principle by introducing perennial irrigation; barrages and weirs effectively flattened a river's variable flow. After independence this project was further carried out under a centralised bureaucracy molded along the lines of the TVA<sup>41</sup>. In order to render a more legible landscape, the colonial state re-ordered nature for greater returns, ushering 'hydraulic modernity'. This modernity aimed to separate land and water into separate entities in order to further the cause of the colonial regime — land as property that was 'owned' generated revenue whilst rivers as 'resources' helped generate electricity and irrigate land. This discrete rendering of land and water into separate domains allowed for a 'wave of new technologies and techniques be deployed to constitute a modern ecological and productive regime'<sup>42</sup>.

The splitting of soils and fluids into discrete domains, however, prompted a decisive economic and technical divergence. Land exorcised of water was transformed into property, to be then elaborated as socio-economic-legal objects. Flowing waters telescoped into

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<sup>40</sup> Anthony Giddens, *The Consequences of Modernity*, 27-9.

<sup>41</sup> See Rohan D'Souza, *Drowned and Dammed: Colonial Capitalism and Flood Control in Eastern India* (New Delhi: Oxford University Press, 2006).

<sup>42</sup> For a longer discussion see Rohan D'Souza, "River as Resource and Land to Own: The Great Hydraulic Transition in Eastern India," *Asian Environments Shaping the World: Conceptions of Nature and Environmental Practices* (Singapore: National University of Singapore, 21 and 22 March 2009), <http://www.nus.edu.sg/dpr/files/abstract/Rohan%20D%27Souza%20paper.pdf> (accessed 25 March 2011).



contained channels, on the other hand, were revealed principally as engineering visions.<sup>43</sup>

This dichotomy was further pushed by the post colonial state through a further centralised water bureaucracy whose roots lie in colonialism. As ‘temples of modern India’, dams transformed a ‘local’ river into a codified ‘national’ resource for development.

### **A unique, bound, national space**

Manu Goswami in her book, *Producing India* asserts that national space is a notion that implies a territorial-political isomorphism of India, was produced by economic exigencies of the British imperial state in the mid and late nineteenth century<sup>44</sup>. In her exploration of the emergence of India as a territorially bounded national entity, Goswami argues that the production of national space was itself a historical process that needs to be taken seriously in order to avoid conflating geographical place as the immanent precursor to the space that the nation and the nationalist community came to occupy.

Exploring the analytical dialectics of the universal and the particular (the unbounded space of capitalism vs. bounded national space) she works out a methodological practice whereby nationalism is situated firmly as a structural response to the apparent ‘deterritorializing’ processes of the imperial economy. She defines ‘*methodological nationalism*’ as entailing the common practice of presupposing, rather than examining, the sociohistorical production of such categories

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<sup>43</sup> Rohan D’Souza, “River as Resource and Land to Own: The Great Hydraulic Transition in Eastern India,” 3.

<sup>44</sup> Manu Goswami, *Producing India: From Colonial Economy to National Space* (Chicago: University of Chicago Press, 2004).

as a “national space” and national economy and the closely related failure to analyse the specific global field within and against which specific nationalist movements emerged<sup>45</sup>. Specifically, Goswami explores the fixing of the idea of the nation. She does this by examining how the abstract categorical conception of the nation is transformed into a taken-for-granted frame of reference. She contends that this process involves ‘fixing collective identities in place and refashioning local and regional solidarities in accord with a larger national whole’. It is through ‘the institution of a lived equivalence between the individual and the nation and the forging of a deeply interiorised affiliation among a particular national space, economy, people, and state’ that a particular national space is realised. The configuration of this national space, she contends, ran parallel to casting a self-sufficient national economy that further reinforced this national space. She further adds that the ‘reification of the nation state as the self-evident container of political, cultural, and economic relations is a social process’<sup>46</sup>. The process itself is reinforced and rooted by the institutions and practices of the modern nation-state. In conceiving the nation form as a modular form during the late 19<sup>th</sup> century, she proposes an alternative understanding of modularity as a historically specific systemic feature of the nation form<sup>47</sup>.

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<sup>45</sup> Manu Goswami, *Producing India*, 4.

<sup>46</sup> Manu Goswami, “Rethinking the Modular Nation Form: Toward a Sociohistorical Conception of Nationalism,” *Comparative Studies in Society and History* 44, No. 4 (October 2002): 794.

<sup>47</sup> Manu Goswami, “Rethinking the Modular Nation form,” 783.

Partha Chatterjee points out that Benedict Anderson's *Imagined Communities*<sup>48</sup> is deeply flawed in understanding imagined communities in the colonies being mere replicas of the modern nation already imagined elsewhere. The modern nation as imagined by colonies such as India he argues had to be different; this was evident in the sovereign domain of culture or the inner sphere of the nation. Historians such as Manu Goswami and Gyan Prakash have contended that the anti-colonial struggle crafted and deployed the 'nation' as a stabilising and normalising category. Gyan Prakash, commenting on Chatterjee points out, the nation-state itself had to be imagined differently in India. 'The nation-state was imminent in the very hegemonizing project of imagining and normalizing a national community'<sup>49</sup>. Nationalists thus, envisioned a political order that would 'express India's being as a free national community in the modern world'<sup>50</sup>. Indian nationalism was therefore compelled to define its political struggle as markedly different from the project of western modernity. Indian modernity, seen in this context is a uniquely Indian phenomenon that is inextricably bound to the nationalist critique of western modernity and organising India as a political community.

The coming of this national space as distinct from any local place changed the scales of popular imagination. At a time when the anti-colonial struggle was gathering momentum, the coming of a distinct national space served the ends of the movement

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<sup>48</sup> Anderson considers nation state building as 'imitative' action, in which new political entities were 'pirating' the model of the nation state. As Anderson sees it, the large cluster of political entities that sprang up in North and South America between 1778 and 1838, almost all of which self-consciously defined themselves as nations, were historically the first such states to emerge and therefore inevitably provided the first real model of what such states should look like. See Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (London and New York: Verso, 1991).

<sup>49</sup> Gyan Prakash, *Another Reason: Science and the Imagination of Modern India* (Princeton: Princeton University Press, 1999), 202.

<sup>50</sup> Gyan Prakash, *Another Reason*, 202.

well. In the 1920s and 1930s, a distinctly national space was the platform for socio-political struggles for greater equality vis-à-vis the colonial state in the economic and public sphere. A unique national space, however, constituted a unity of geography in imagination. Despite understandable individual differences, imaginations about national space needed to revolve around certain common minimums. It was the ability of the national space to invoke this common imagery that it was so useful during the anti-colonial struggle and after<sup>51</sup>. If anything, post colonial India was far more entrenched in the idea and importance of a national space, which was decidedly removed and superior to local place. National space thus reinforced and formed out a common imagination that sought to reconfigure the notion of India. In effect the national space became the platform on which the nation state could be realised in its true potential. The coming of a unique national space, far removed from local place, provided the necessary impetus to thinking on a national level. As the later chapters show, thinking and planning for the 'nation' gathered currency in the cusp years of the colonial state. Situating rivers as a part of the bound, distinct national space, as part of the plans for development became an important means by which local claims could be delegitimised.

### **Making 'national' water**

Jamie Linton in his study of modern water contends that the 'modern idea of water as an objective, homogenous, ahistorical entity is complimented by its physical containment and isolation from people and reinforced by modern techniques of management that have enabled many of us to survive without having to think much

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<sup>51</sup> Gyan Prakash, *Another Reason*, 202.

about it'<sup>52</sup>. He states that the twin processes of the formulation of water as a chemical formula i.e. H<sub>2</sub>O, and the development and dissemination of the concept of the hydrologic cycle represent an important contribution to the idea of abstract, modern water. Describing in detail, the history of the modern hydrological cycle, as it is now known, he considers how the cycle was 'deliberately constructed in, rather than *revealed* through scientific practice'<sup>53</sup>. In doing so, there is a detailed investigation of the strategies through which the hydrological cycle was projected backwards until it seemed like it had no origins i.e. it was there to be revealed rather than constructed. In sum, he highlights the ways in which the hydrological cycle was 'ensconced by means of writing a hydrological history'. By projecting backwards into the works of ancient philosophers, and modern scientists alike, this history was essentially an assemblage. Writing hydrological history by projecting it backwards thus helps create a context for contemporary interventions with regards to water. In establishing such a history, interventions (normally technological) as well as the state itself are legitimised. A long history projects a sense of stability and coherence. In the context of the present chapter however, this coherence also becomes an analytical tool to investigate the links between modern water, the hydrologic cycle, and the modern state as Linton does. Chronicling the rise of centralised water management in the western United States, he illustrates the co-dependent relationship between modern water and the modern state; essentially arguing that the state has materially engineered modern water as a resource, while water resources have strengthened the apparatus of the state. In doing so, he also shows how the hydrological cycle was

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<sup>52</sup> Jamie Linton, *What is Water*, 21. Emphasis in original.

<sup>53</sup> Jamie Linton, *What is Water?*, p 21. Emphasis in original.

deeply implicated in this process, making visible water resources of the entire country. This legibility was used by planners to come up with detailed plans for 'integrated' basin wise development. As rivers came to be packed as modular, transportable data sets, they could be compared across geographies. The expertise that controlled and 'tamed' these rivers was concomitantly transportable. Klingemsmith, in his study chronicles the transportability and adaptability of this expertise and modular river sets, of the TVA idea to India. It is through this active export that the world's rivers came to be abstracted and represented as quantities of flows; functions of numbers.

For the scope of this chapter however, it is important to dwell upon the philosophical investigation that Linton conducts in order to elaborate on the fundamental incompatibility of modern water with people. Linton argues that despite being produced in relation to social practice, modern water is nevertheless taken to be entirely independent of social relations. Borrowing from Bruno Latour and the Actor Network Theory, he claims that the 'fictional' independence of water from society is at the core of the 'constitution of modern water'. This constitution of modern water holds together 'only so long as the appearance can be sustained in hydrological and popular discourse'<sup>54</sup>. Recent scholarship as well as environmental movements have sought to locate water more socially, concentrating on the social life of water<sup>55</sup>. Modern water, in its avowed asocial nature, is therefore under crisis. Its re-acquaintance with society is at best a troubled<sup>56</sup>.

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<sup>54</sup> For a discussion on the fictitiousness of this independence see Jamie Linton, *What is Water*, 175.

<sup>55</sup> Amita Baviskar, *Waterscapes: The cultural politics of a natural resource* (Ranikhet, Uttaranchal: Permanent Black 2007).

<sup>56</sup> Jamie Linton, *What is Water*, 181.

Applying Latour's 'Modern Constitution', to the study of water, Linton suggests that although it may appear to be asocial, modern water is as deeply embedded in the social fabric of modern Western culture as 'the tanks of southern India or the water temples of Bali are embedded in those cultures'<sup>57</sup>. Indeed the task is to provide an analytical framework to analyse it as such. As a stable category, modern water allows the 'facts' to speak for themselves; the idea of water as a quantifiable substance is primordial to this process — for it is from here that water is a 'resource' that must be tapped into. The constant and detailed quantification of water through hydrological data frames water as a resource that can be mastered and controlled provided the right interventions are used.

Using the Heideggerian term of *gestell* with specific reference to the hydrological cycle, Linton points out that the prevalence and superiority of the hydrological cycle in present day discourses on water makes it impossible to entertain other modes of revealing. Once revealed in this way, the technological disclosure of entities such as water as resources and raw materials compels humanity to erect a world of total mobilization. In a radical shift, Linton relates the hydrological cycle to the constitution of modern water, remarking that while it was being constituted as great 'natural' system, the hydrological cycle was surreptitiously adulterated by the presence of the humans from the very start, thus defiling the 'purity of the water balance equation'. The presence of losses in the hydrological cycle, natural in its presence, is no mere coincidence; it is characteristic of human intention. As the ground on which the science of hydrology is constructed as well as the object of its investigations, the hydrological cycle, thus served as a framework in which

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<sup>57</sup> Jamie Linton, *What is Water*, 181.

interventions could be safely situated without fear of producing radical socio-ecological dislocation.

Thus, through the simultaneous manoeuvre of transplanting and then severing people from the mixture, according to Linton,

The hydrologic cycle can be depicted in a way that features major structural works such as reservoirs and dams without raising political questions about the social production of water. Even the instruments that hydrologists have used to measure precipitation, stream-flow, evaporation, and so on can be shown without having to acknowledge that it is by virtue of such instruments and the disciplined coordination of the measures they record that the hydrologic cycle has been constructed in the first place —the recording of such measurements is understood merely as a matter of observing and representing the nature of water.<sup>58</sup>

The dominating presence of the hydrological cycle in popular imagination and hydrological science is also seminal to the dovetailing of water resource development of the nation. ‘As a means of making water legible for administrative purposes, the hydrologic cycle was ideal’.<sup>59</sup> Knowing the hydrological cycle, being able to quantify flows, knowing where all the water came from allowed rivers to be manipulated for control. According to Linton, this accomplishment, ‘as much or more than the physical manipulation of water, constituted the realization of its “complete control” and the means by which modern water came to dominate the rivers as well as the

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<sup>58</sup> Jamie Linton, *What is Water*, 187.

<sup>59</sup> Jamie Linton, *What is Water*, 157.



popular imagination'<sup>60</sup>. The hydrologic cycle thus according to Linton, 'served as a framework in which human could safely situate their interventions without fear of producing radical socio-ecological dislocation'<sup>61</sup>.

In 'Hydraulic bureaucracies: Flows of water, flows of power'<sup>62</sup>, Molle et al cover an extensive landscape chronicling ideas of irrigation and water management over the last two centuries or so. Exploring colonial ideas of the 'march of civilization' and their biblical connotations, the authors bring out the emergence of 'hydrocracies' the world over especially in the 'new world'. Dwelling on the 'hydraulic mission'<sup>63</sup> i.e. the belief that not a single drop of water should reach the sea without being put to work for the benefit of man, the authors dwell upon the emergence of the Bureau of Reclamation, the TVA in the USA, large scale water development institutions in the Soviet Union and the hydrocracy in India among other countries. While locating the emergence of hydrocracies in the colonial period, the authors emphasise the changing form of these institutions in the post colonial world — while in the USA electricity changed from being a public good to being a commodity — the onus of building large-scale products remained in the public domain. Although there was experimentation with private capital building large scale water development projects, in the post colonial world, especially in India, this remained a state run activity which was subsumed under the larger rubric of 'development' and 'national identity'. According to the authors, the hydraulic mission orientation is thus not just supported by water resources professionals'

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<sup>60</sup> Jamie Linton, *What is Water*, 187.

<sup>61</sup> Jamie Linton, *What is Water?*, p 186.

<sup>62</sup> François Molle, Peter P Mollinga, and Philippus Wester, "Hydraulic bureaucracies and the hydraulic mission: Flows of water, flows of power," *Water Alternatives* 2, No. 3 (2009): 328-349.

<sup>63</sup> François Molle et al, "Hydraulic bureaucracies," p 331

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. In some ways, the authors echo Linton's contention that the state materialised modern water while modern water helped build the state in a kind of reciprocally constitutive - process. Essentially, the state materially engineered modern water as a resource, while water resources development apparatus strengthened the apparatus of the state. More importantly, they point out that,

[B]ureaucracies have their own sets of interests and ideologies.

Bureaucratic power is strongly correlated with the size of the budget received from state coffers, the number of staff, and in the case of water the heavy equipment needed for infrastructural interventions.

This power is therefore dependent upon fuelling and sustaining the cycle that goes from planning to the construction of infrastructures.<sup>64</sup>

Unpacking the 'hydraulic mission' thus would reveal the reasons for the disposition of hydrocracies as well as their persistence in the face of contestation.

#### **A nature without flaws:**

Recent scholarship has pointed out that modern water and the modern state share an indelible relationship. According to Donald Worster in *Rivers of Empire*, this period saw an 'immense ballooning of the state, which is to say, the federal

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<sup>64</sup> François Molle et al, "Hydraulic bureaucracies," 336.

government and its bureaucratic apparatus<sup>65</sup>, beginning in the American West. After the Second World War, this large bureaucratic apparatus was deployed in the fight against Communism, in various parts of the world<sup>66</sup>. In the decades immediately after the war, many model Tennessee Valley Authorities' (TVAs) mushroomed across the globe; in India, the Damodar Valley Corporation was cast in the frame of the TVA. Simultaneously the Central Waterways, Irrigation and Navigation Commission (CWINC) arose as the central body managing water in India, employing primarily engineers from across the country.

In his seminal study of the reordering of the American West through multipurpose river valley projects and pork-barrel politics, historian Donald Worster remarks that the 'most glaring irrationality engineers faced was in nature itself<sup>67</sup>. Surely no capable earth designer would wilfully leave an area as vast as the American West arid; aridity was '*ipso facto*'<sup>68</sup> a defect, an illness requiring a physician to heal it. To the engineering mind Worster remarks, a rational world would be one where yields were steady, uniform and reliable — deviations would not figure in such a world. Unlike nature that was so prone to vast extremes, an ordered, rational world could be easily controlled. In such a world, rivers too would be transformed into steady, uniform flows; there would be no wastes running to the seas. Stream flows would not be variable and would instead irrigate lands and provide electricity in an orderly, controlled manner. In essence Worster says such a view would cast nature as a function of technology as the corrective: 'All those natural imperfections would

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<sup>65</sup> Donald Worster, *Rivers of Empire: Water, Aridity and the Growth of the American West* (New York and Oxford: Oxford University Press, 1985), 279.

<sup>66</sup> Jamie Linton, *What is Water*, 161.

<sup>67</sup> Donald Worster, *Rivers of Empire*, 154.

<sup>68</sup> Donald Worster, *Rivers of Empire*, 154

have to be set right. Science demanded a nature without flaws.’<sup>69</sup>

Such a corrective fundamentally changed the way nature came to be understood. In order to yield rational, steady results, rivers had to be studied as complete, singular units from source to sea in order to be wholly productive. No longer could they be associated with locality; they had to work as an entire watershed in order to be useful. Thus, ‘conservation’ to most American hydraulic engineers of the late 19<sup>th</sup> and early 20<sup>th</sup> century meant complete technological dominance of rivers to ensure maximum efficiency. As most of these engineers were to realise in due course, such a task could be undertaken only by the state — an entity able to part with its vast resources, assemble a permanent body of expertise and patiently wait for returns. Ironically, the West drew an inspiration for its body of expertise from irrigation experiences of the British Empire in India. In under a century however that inspiration was re-sent back to India in the form of the ever replicable TVA model. For this chapter however, it is important to point out that in their effort to rationalise most efficient flows, engineers and scientists were often enthusiastic about centralization of authority so as to being ‘water development under one head’<sup>70</sup>. Such a move would yield an era of rationality and modernity. Engineers employed reason instrumentally: ‘[R]eason in the service of productivity, economic maximization, and domination, reason not about ultimate ends but about means’<sup>71</sup>.

Engineers thus ordered rivers rationally through territories and geographies to yield sustained, uniform flows. Through the twin logics of productivity and technological domination, rivers were rendered legible across landscapes and

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<sup>69</sup> Donald Worster, *Rivers of Empire*, 154.

<sup>70</sup> Donald Worster, *Rivers of Empire*, 147.

<sup>71</sup> Donald Worster, *Rivers of Empire*, 147.

geographies. Such a rendering made comparisons and models possible. The instrumentality of nature also lent itself well to surveys and other empirical means to fathom the extent of 'resources' available at hand. Nature, especially rivers could thus be read as resources needing the most efficient technological means to exploit them. Such a resourceful reading of rivers formed the basis of many an exploration into riverine frontiers.

Seen in this light, dams are artefacts that are in 'dire need of disassembly', to open more analytical possibilities. Recent scholarship has very eruditely pointed out that dams are representatives of political, transnational capitalist stakes. From the preceding discussion, it is clear that the large dam is premised on a number of ideas stitched together: modern water, expert control, instrumentality of nature, 'national' space. These ideas locked together to form a complex matrix that justified technological intervention and expert control and packed rivers into datasets, with universal expertise. But as the discussions of modernity, modern water and technology have shown; these notions were not stable in themselves. They were contingent on particular social and political contexts. Despite changing political and social contexts, the matrix remained intact. It is only recently, that scholarship and environmental movements have begun to open the matrix up to critique, pushing it from all directions. More importantly however, this matrix became the bedrock on which engineers arranged rationales for rivers as resources, data sets, across geographies, histories and societies. These rationales, in effect drew upon notions of expert control and modern water to craft complex arguments to justify large scale technological interventions on riverine landscapes.

## Chapter II

### Development, Planning and Modern Water

The idea of ‘development’ came to occupy a central place in popular and political imagination in the latter half of the 20<sup>th</sup> century. The idea of development was a European phenomenon which emerged during the colonial era; however, it soon came to be viewed as a universal necessity. Development came to be cast as a national imperative. In the period after the Second World War, development became the platform for technological expertise to travel across geographies. According to Gustavo Esteva,

Never before had a word been universally accepted on the very day of its political coinage. A new perception of one’s own self, and of the other, was suddenly created. Two hundred years of social construction of the historical–political meaning of the term ‘development’ were successfully usurped and transmogrified.<sup>1</sup>

In the 19<sup>th</sup> century, philosophically, development was understood as the improvement of humankind, while practically it was understood by political elites as social engineering of emerging national societies. As recent scholarship has shown, colonialism worked in specific ways to ensure a reordering of the physical and social landscape to aid the ends of colonial capitalism. It was, however, at the end of World War II that development became a universal goal.

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<sup>1</sup>Gustavo Esteva, “Development,” in Wolfgang Sachs (ed), *Development Dictionary: A Guide to Knowledge as Power* (London and New York: Zed Books, 2010, first edition 1991), 2.

In independent India, like in many other post colonial societies, development came to be tied to the process of nation building<sup>2</sup>. Specifically, India, in the form of an independent nation state was constantly invoked as the object of development. Rivers came to be understood and projected as a culmination of ‘head’ and cusecs. By fixing the nation state as the object of development, the contours of the nation state were established whilst simultaneously casting it as an independent, self-sufficient unit. By portraying the nation state as one distinct freestanding unit, India could be represented as an empirical object. Its socio-political and economic processes could be represented as internal functions that were far removed from other socio-political forces outside the system. According to Timothy Mitchell, the ‘strictly “national” identity of a population, an economy, a language, or a culture is an image that has to be continually reinvented’<sup>3</sup> against the wider forces of that shape societies and peoples.

In his study of techno-politics in Egypt, Mitchell further points out that there are two distinct consequences of taking the nation state as a granted object of development: the illusion of the model and of a self-contained unit<sup>4</sup>. The free-standing nation state that is removed from larger global economic and political forces is a functional unit that is comparable across boundaries. While Mitchell dwells on economic features that appear so easily transferrable, I argue that the national character of ‘resources’ lets nature, more so rivers, be compared across boundaries without regard to their geographical, cultural and local differences. Through the

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<sup>2</sup>Benjamin Zachariah, *Developing India: A Social and Intellectual History c. 1930-1950* (New Delhi: Oxford University Press, 2005).

<sup>3</sup>Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley: University of California Press, 2002), 230.

<sup>4</sup> Timothy Mitchell, *Rule of Experts*, 231-33.

narratives of engineers highlighted in the sections that follow, I argue how rivers came to be read as resources without environmental contexts.

This constitution of rivers as resources was organised along engineering tracts. As the previous chapter showed, ideas of modern water, expert control constituted a complex matrix, which itself became the bedrock of these engineering tracts. These tracts, I argue, imbibed ideas of modern water and expert control and unproblematically propagated them, epitomising the self-propelling prophecy of the hydraulic bureaucracy. Arranged along four distinct rationales, they were not chronological or linear but simultaneous and mutually constitutive.

The first rationale fixes the nation state as the object of development through a long history of hydraulic manipulation. A contiguous history of water resource development, I argue, disembeds place and instead anticipates a national space for development. It also gives coherence to the idea of an *ipso facto* post-independence state: one that is far removed from the exigencies of partition and state making.

The second rationale drives indigenous expertise in dam building to increase self reliance. Such expertise would reduce the need to look westwards, it was observed by engineers such as A.N. Khosla and Kanwar Sain. In addition, indigenous expertise, over time, could itself be exported to other developing countries.

The third rationale was a neo-Malthusian argument of over population, underproduction and imminent scarcity. The only way out of such a trap was to maximise the scale of interventions on riverine landscapes i.e. large dams and multipurpose projects. Posed as problems of technology, this rationale underscored



the need to 'scale up' technological interventions and render greater parts of the riverine landscape legible.

Drawing upon the third rationale, the fourth rationale, called for basin-wide development of rivers. Basin-wise development, it was argued was the only way to ensure rivers did not run to 'waste'. In addition, basin-wide development would create modular riverine units that could be linked up in the 'National Water Grid'. In sum, being constituted of and through these rationales, rivers became data sets.

### **Making history: projecting the large dam backwards**

Hydraulic manipulation has a long history in the Indian subcontinent. Irrigation has been practiced by agriculturalists for millennia. This hydraulic history as recalled by engineering tracts, I contend, is no anomaly. The novelty in these narratives however is the recasting of modern irrigation as the logical conclusion to millennia long hydraulic manipulation practices. Having been a product of colonialism, hydraulic manipulation was now established by writing a specific hydrological history. This was done through the projection of irrigation, specifically dams and canals as an age old component of the riverine landscape. It is this recasting of modern irrigation as a logical conclusion to a millennia long project that was aided and not fundamentally pushed by the colonial state that sets up the platform for the radical break that independence offered. The backward projection allows a continuity to be established, thus constituting an unbroken tradition of hydraulic manipulation. These narratives do not overtly engage with colonialism, instead draw upon the World Wars and the Bengal famine of 1943 as the reasons for the ambitiousness of post-independence water resource development. As the snippets below will show,

irrigation, dams and inland navigation are shown to have long histories. In often sweeping histories across thousands of years, these accounts draw upon a variety of sources that all culminate in the same vein of argument: river development is age-old. More so however, in its constant invocation of 'India', it helps fix the nation as a free-standing, self-contained unit that can be a comparable model. Thus, strictly coded along 'national' lines, this age-old history of river development disembeds the locality of place. As R. D. Dhir, the director of Hydrology of the then newly formed Central Water & Power Commission (henceforth CW&PC) in a journal article remarks:

There is much evidence to suggest that irrigation from wells and inundation from swollen rivers during the monsoon have been practiced in India since the earliest times even before the commencement of the Christian era. Later, the Grand Anicut of Madras is known to have been built about 200 A.D. The practice of inundation canals was a feature peculiar to northern Indian from very ancient times. During the Mughal period in 14<sup>th</sup> to 17<sup>th</sup> centuries, irrigation development received the attention of ruling dynasties. In fact, it is these ancient works that provided the framework for the subsequent build up of irrigation systems.<sup>5</sup>

This same paragraph is repeated almost verbatim in the 1959 special number on Central Water and Power Commission of the *Indian Journal of Power and River Valley Development*. This long history of hydraulic manipulation forms a background

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<sup>5</sup> R.D. Dhir, "Utilisation of Water Resources India," *Indian Journal of Power and River Valley Development* 2, No.7 (June 1952), 2-3.

to almost all the articles in the aforementioned special number. Throughout the 1959 special number, histories of water resource development are long and underscore the need to develop water resources in order to produce power for industrial development.

In an article on inland navigation in India, M.L. Sood, the Director of the CW&PC in charge of inland navigation draws upon diverse sources from the Greeks to 'Jatakas' from pre-Buddhist India, 'Old Tamil poets' and Chanakya's *Arthashastra* to underscore his moot point: navigation was highly developed along 'the country's rivers'. Sood contends that the 'great maritime activity of those days could have only followed inland navigation'<sup>6</sup>. This claim is based on the various sculptures of the age that depict the different features of inland craft. Tracing the extant flourishing trade routes on Indian rivers — especially the Ganges and the Indus — Sood marks the development of the railways as the beginning of the decline of inland navigation. Inland navigation, became an important premise and product of river linking. This long history of irrigation and dam technology however 'provided the background for the subsequent building up of irrigation system in this country'<sup>7</sup>. However it is 'mainly during the past 100 years that extensive works have been constructed, extending the benefits of irrigation to vast areas'<sup>8</sup>.

In a tour d'horizon, both Dhir and Sood embed irrigation and flood control interventions as having a more or less contiguous history. More importantly however,

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<sup>6</sup> M.L. Sood, "Inland Navigation in India," *Indian Journal of Power and River Valley Development* 9, Nos. 6 & 7 (June- July 1959, CW&PC Special Number), 45.

<sup>7</sup> R.D. Dhir, "Water Resource Utilisation in India: A Brief Review," *Indian Journal of Power and River Valley Development* 9 Numbers 6 & 7 (June- July 1959, CW&PC Special Number), 50.

<sup>8</sup> Kanwar Sain, "Developing India's Water and Power Resources," *Indian Journal of Power and River Valley Development*, Volume 9 Numbers 6 & 7 (June- July 1959 CW&PC Number), 37a.

the embedding serves as a means to justify further technological interventions. The scale of these interventions, as these engineers painstakingly point out, is national. Enumerating a series of local interventions, with very different social and political contexts, both Dhir and Sood rally their ideas around 'India' as a nation. No matter what their individual differences, the fact that these interventions were conducted in India, as it came to be configured geographically, after colonialism was enough to render them a constituent of national space. In contemporising national place as the object of development, the nation came to be recognised in certain ways. As the previous chapter pointed out, the coming of national space over local place made the nation state into a modular form. This modularity as Mitchell points out, gives it mutability and mobility in that they could be compared across social, political and ecological contexts. Interestingly in these narratives, there wasn't an engagement or even a reference to colonialism as it was experienced in India. Expansive and long histories served as a means to avoid commenting on colonialism.

Daniel Klingensmith in his study of 'nationalist engineering' remarks that engineers such as Kanwar Sain 'did not want to free modern science and technology in India from their colonial connections'<sup>9</sup>. In the eyes of engineers such as Sain, colonialism was not entirely bad insofar as it helped bring modern science and technology to India. In his analysis of the careers of A.N. Khosla and Kanwar Sain, Klingensmith remarks that engineers such as Sain, did not recall the British as selfish or corruptible. Indeed, 'colonialism's only flaw seems to have been that it constituted

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<sup>9</sup> Daniel Klingensmith, *One Valley and a Thousand: Dams Nationalism and Development* (New Delhi: Oxford University Press, 2007), 232.

an insult in that it denied that Indians could fully be partners in the enterprise of modernity'<sup>10</sup>.

As self-avowed nationalists, these engineers understood modernity as a universal truth that was denied to India pre-independence. It is interesting that for these engineers and scientists, science and technology were divested of any vested interest. Modern science was seen as a universal, emancipating category. Indeed modern science and modernity came to be recast as conditions that made greater exploitation of nature possible. According to S.N. Gupta: '[S]cientific, engineering and industrial research directed towards greater understanding and greater control of material surroundings is the keynote of the modern search for progress and power'<sup>11</sup>.

Modernity's unfinished business was complete control of nature — which could only be realised through the nation. As the object of development, the nation came to symbolise coherence. As Mitchell describes, this coherence was external but helped cast the nation in a modular, transfer friendly format. Immediately after independence, the post colonial Indian state was still figuring out its contours. Sunil Khilnani in his book, *The Idea of India*, contends that as the first Prime Minister of 'free' India, Jawaharlal Nehru had the onerous task of keeping India together. Despite his idealization of the past, he brought the country together by appealing to the struggles they had been through together. The common and long history of hydraulic manipulation, I contend, is another attempt at uniting India across its scattered geography. The 'common' and contiguous history of hydraulic

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<sup>10</sup> Daniel Klingensmith, *One Valley and a Thousand*, 233.

<sup>11</sup> S.N. Gupta, "Challenges of Seventies, Eighties, And Central Water & Power Commission," in *Central Water & Power Commission (CWPC) Silver Jubilee Souvenir* (New Delhi: Ministry of Irrigation and Power, Government of India, 1970), 3.

manipulation as led by engineers and experts rewire a political question into a technological one. The solutions, as the engineers painfully point out lie in engineering expertise. More importantly, they hold the idea of India as one cohesive unit in a public way, legitimising it.

In the years between the first and second special numbers of *Indian Journal of Power and River Valley Development* i.e. 1959-1970, however, a lot had changed, politically. India had fought two wars — with China and Pakistan. There was a certain amount of political stability and pronounced progress in the dam building exercise<sup>12</sup>. Parallely, India's riverine landscape had fundamentally changed: Bhakra Nangal, Hirakud, Nagarjunasagar were all up and running. In this time the CW&PC had emerged as the premier design and development organisation for dam projects in India. The idea of India needed to be invoked lesser by this time; the project of development had acquired far more currency and agency. In the second special number on the CW&PC, irrigation and dam development as ancient practices were invoked lesser. Independence came to be constituted as the radical break that provided the necessary impetus to water resource development in India.

The second special number of the *Indian Journal of Power and River Valley Development* coincided with the 25<sup>th</sup> anniversary of the CW&PC. To commemorate the occasion, the CW&PC brought out a Silver Jubilee Souvenir that consisted of 43

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<sup>12</sup> As the party leading the 'freedom' movement, it was perhaps inevitable that the Congress party came to power in the first general elections in 1951. Between 1951 till his death in 1964, Nehru remained India's first and only prime minister. According to political scientists like Rajni Kothari, Nehru at the helm stabilized the Congress as a political party as well as gave it plurality. In addition, Nehru has been credited with being the chief force behind the post colonial Indian state's developmental ideals. See Rajni Kothari, *Politics in India* (New Delhi: Orient Blackswan, 1970).

contributions about the CW&PC and its work in India and abroad. The CW&PC had already gathered momentum as a premier organisation through the many projects it had brought to fruition. The CW&PC came to represent 'progress'. Development of the 'nation' was deeply intertwined with the further development of the CW&PC. As S.K. Jain remarked:

It's (the CW&PC's) development and march towards organisational expansion has been linked up with the development and planning of projects in the country since Independence and thus the stature of the Commission today is a barometer of the progress achieved by the country in the fields of irrigation and power.<sup>13</sup>

This one statement is indicative of the heady times. But it wasn't the only one of its kind. Rapid and sustained development of the power sector came to occupy a seminal place in the engineering imagination. Throughout the special number, there are numerous mentions of the need for a national power grid, development of power for the nation. As M. Hayath, commenting on the intertwined nature of national development and power development said: '[E]lectricity has today become so indispensable that the extent to which a nation has developed its use is more or less a yardstick of its economic development'<sup>14</sup>.

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<sup>13</sup> S.K. Jain, "25 Years of CWPC – A Historical Review," in *Central Water & Power Commission (CWPC) Silver Jubilee Souvenir* (New Delhi: Ministry of Irrigation and Power, Government of India, 1970), 21.

<sup>14</sup> M. Hayath, "Power Development in India," *Indian Journal of Power and River Valley Development* 9, Numbers 6 & 7 (June- July 1959 CW&PC Special Number), 39.

Kanwar Sain summed up the heady times emphatically: '*[K]ey to the production of wealth is the Kilowatt. Underlying the country's capacity to produce anything else is our capacity to produce power.*'<sup>15</sup>

The rest of the special number is peppered with comments such as the one cited above. The development of electric power for irrigation and industrialization came to be a moot point around which arguments for large projects were organised. In their avowed detailing of technological interventions at various levels, these narratives articulated a growing need to scale them up. Further, they underscored the need for strictly expert led interventions. Such a long, strongly technological narrative further strengthened the rationale for technical expertise to manage water. According to H.S. Desai, '[V]iewed purely from technical angle, and given all the goodwill that such cases deserve other angles; it is felt that engineers could and should have the last word on the development of the water resources of the country'<sup>16</sup>.

A long history of hydraulic manipulation helped development acquire a national dimension and scale. Interestingly, as the narratives above show, the development of water resources, the nation and that of the bureaucracy are inextricably linked. As the barometer of development and progress, the development of the technocracy was understood as a deductive fact. This championing of a burgeoning hydraulic bureaucracy, I argue, helped incubate and insulate it from overt political and social questions. A large scale technocracy guiding the project of development was symptomatic of the self belief of engineers, as well as the self-

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<sup>15</sup> Kanwar Sain, "Developing India's Water and Power Resources," 37b. Emphasis added.

<sup>16</sup> H.J. Desai and G.V. Rao, "Role of CW&PC in development of inter-state rivers," in *Central Water & Power Commission (CWPC) Silver Jubilee Souvenir* (New Delhi: Ministry of Irrigation and Power, Government of India 1970), 82.



propelling prophecy of the technocracy itself. This ballooning organisation would then help fight other monsters confronting the development process: need for indigenous expertise, food production and over population. As the sections below will show, these themes played an important role in furthering the cause of water resource development, and hydraulic bureaucracy in post colonial India.

### **Engineering Expertise and Self-Reliance**

Unlike other fields of expertise, engineering became a panoptic enterprise. As mentioned elsewhere, autobiographical sketches of engineers such as Kanwar Sain and K.L. Rao paint a picture of the engineer as a singular category, removed from the practicalities of colonialism. There is little or no mention of colonialism in these narratives. In fact, pre-independence narratives stick to a neat chronology: development of canal irrigation through new projects and refurbishing some old ones; the World Wars and their effects on the world economy and finally India's independence. Often cast as 'nationalist heroes'<sup>17</sup>, engineers were imbued with the capacity and authority to reengineer nature for the 'nation'. In order to build the kind of nation independence sought, there would need to be a greater investment to ensure development would proceed at a planned pace. There was a great emphasis on building indigenous expertise that was exportable; self reliance with regard to technology and technological solutions as the narratives below will show.

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<sup>17</sup> Daniel Klingensmith, *One Valley and a Thousand*.

Engineers such as A.N. Khosla had developed an ‘immense faith in Indian engineers and their initiative, innovation’<sup>18</sup> and therefore lobbied hard to ensure Indian engineering expertise was used in dam construction. While chronicling the indigenous construction of the Bhakra Dam, Khosla stressed the savings that such an effort would mean to the exchequer in addition to the ‘invaluable practical experience for the design and construction of other dams of similar or bigger magnitude’.

I also stressed that if this major dam was entrusted to foreigners, both the engineers and politicians will lose faith in our own capacity to do any thing big, that the second, the third and subsequent dams of this magnitude will perforce have to entrusted for construction to foreigners and that our engineers will never have the opportunity of gaining intimate knowledge and experience in the thousand little facets of design and construction which between them make for success in safe and economic construction.<sup>19</sup>

The eventual construction of the dam by Indian engineers was the most ‘important decision taken by independent India and it worked’<sup>20</sup>. Indigenous dam building expertise came to be regarded as a cost saving yet confidence building measure. This would help Indian engineers rise to the fore as foremost technologists, who could guide the same process elsewhere in the world. This expertise could then be used to help other countries. S.K. Jain poignantly remarks:

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<sup>18</sup> A.N. Khosla, “My Reminiscences of The Central Water Commission,” *Indian Journal of Power and River Valley Development* 20, No. 3 (March 1970, CW&PC Special Number), 111.

<sup>19</sup> A.N. Khosla, “My Reminiscences of The Central Water Commission”, 111.

<sup>20</sup> A.N. Khosla, “My Reminiscences of The Central Water Commission”, 111.

As a sequel to the vast experience gained by the organisation in its studies of progress in these two decades and a half, Indian engineers are now in a position to impart know-how regarding the planning, investigation, design and construction of river valley projects to other developing nations of the world.<sup>21</sup>

Indian dam building expertise came to be imagined as an exportable commodity. Indeed, India played an active part in ‘the developmental work of the Lower Mekong Basin’ as well doing the ground work for projects in Nepal and Bhutan. This expertise promoted self-reliance. Like the exportable expertise of the TVA, India was well on its way in developing its own expertise.

Jain’s statement is interesting for two reasons. Firstly, it captures Indian engineering expertise as enjoying a rise in popularity and skill. Indian participation in the Mekong basin and in Nepal and Bhutan is testament to this technical know-how. Secondly, it helps reconfigure interest in water resource development as distinct from that during colonial times. In his reference to the ‘last two and half decades’, Jain creates a break in the kind of expertise pursued after independence. Both Khosla and Jain view post-independence expertise as distinct from colonial expertise as the former order nature for ‘the nation’ while the latter did so for profit.

This interest in water resource development, however, was not radically different from its colonial precedents. In his detailed study of large dams, Satyajit Singh points out that, post-independence planners in India laid emphasis on the use of ‘stable’ irrigation in the form of storage systems under medium and major projects i.e.

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<sup>21</sup> S.K. Jain, “25 Years of CWPC—A Historical Review,” 18.

dams. Agricultural output was sought to be increased in order to match that of developed countries through modern methods of farming and fertiliser use. While the colonial irrigation policy was concentrated towards revenue generation and resource maximization, post-independence planning was geared towards greater output. Both demanded greater returns on investment. In sum, the post-independence impulse to plan for development, Singh says, can be understood as a continuation of British policies toward irrigation and agriculture.

Despite the striking similarity in the ways in which the British and Indian state understood the instrumentality of nature; their trajectories were very different. While marking a continuity of tradition, there was a need to anticipate an indigenous form of expertise that would promote both self reliance and development<sup>22</sup>. Instead of arranging rivers for profit as colonialism did, indigenous expertise sought to arrange rivers in national interest. Indigenous expertise that was used to building large dam projects would do more than just promote self reliance; it would also be exportable to other developing countries.

### **Problems of Technology: Scarcities and limits**

Population, when unchecked, increases in a geometrical ratio.

Subsistence only increases in an arithmetical ratio. A slight

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<sup>22</sup> A.N. Khosla, "My Reminiscences of The Central Water Commission," 110; and Kanwar Sain, "Central Water & Power Commission: Some reminiscences and stray thoughts," *Indian Journal of Power and River Valley Development* 20, No. 3, (March 1970, CW&PC Special Number), 117-122.

acquaintance with numbers will show the immensity of the first power compared to the second.<sup>23</sup> – Thomas Malthus (1798)

There are two equally important elements in human progress. They are the development of spirit and character on the one hand, and the mastery of the physical world on the other... Without mastery over nature, our earth, as it stands would support but a small fraction of the present population... I submit that hunger and poverty are no longer beyond solution. The mastery over the physical world gives us the key to the problem. The most thickly populated regions on earth can be satisfactorily fed if the most effective known methods are applied. The technical possibilities of feeding the world will probably always run far ahead of the increase in population.<sup>24</sup> – Kanwar Sain (1957)

The fateful year 1947- the year of India's independence brought both responsibilities and opportunities. The country was faced with the basic question: Adequate production of food for the growing millions.<sup>25</sup> – S.N. Gupta (1970)

The food production has to keep pace with the ever increasing requirements of population. The principal remedy for meeting this

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<sup>23</sup> Thomas Malthus, *An Essay on the Principle of Population : An Essay on the Principle of Population, as it Affects the Future Improvement of Society with Remarks on the Speculations of Mr. Godwin, M. Condorcet, and Other Writers* (London, St Paul's Church-Yard: J. Johnson, 1798), 4. <http://www.esp.org/books/Malthus/population/Malthus.pdf> (accessed 20 April 2011).

<sup>24</sup> Kanwar Sain, "The Engineer in the Developing Community," *Indian Journal of Power and River Valley Development* 7, No. 3 (March 1957), 1.

<sup>25</sup> S.N. Gupta, "Challenges of Seventies, Eighties, And Central Water & Power Commission," 1.

increased demand is to steadily extend irrigation facilities.<sup>26</sup> –Kanwar Sain (1959)

At the time the first statement was written, India was being ruled by the British East India Company. By the time subsequent statements were written over a century and a half later, India was a country — one unified territory — and an independent one at that. The concerns of the statements however remain the same: limited resources and an ever increasing population. They are carefully worded alarms about scarcity and impending catastrophe. These alarms can be found in almost every article of the two special numbers on the Central Water & Power Commission as well as other articles of the *Indian Journal of Power and River Valley Development* and the Silver Jubilee Souvenir of the CW& PC. Posed as technological problems rather than political or social, the anticipated solutions were also technological. The solutions were necessarily technical, ensuring maximum utilisation. Often times, the answer was simply put: greater investment in developing ‘water resources’ to ensure that the twin challenges of a rising population and looming food scarcity could be met effectively.

This neo-Malthusian trap anticipated more than just technological problems and solutions. As the arguments below will show, more than the technological solution, it was the scale of the interventions that drove the point home. The rhetoric about looming scarcity and overpopulation served as a hinge to present arguments for large multipurpose projects. Relieving flood, food and irrigation problems, these projects would also ensure the entire basin of the river was under use. This was

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<sup>26</sup> Kanwar Sain, “Developing India’s Water and Power Resources,” 37 a.

unprecedented. Modelled on the TVA, these projects would render rivers into a ledger of flows and returns. As a complete system of inter-related projects, the aim was to ensure rivers were no longer 'wasted' by flowing to the sea. Basin wide development therefore had to be premised on the scarcity trap.

Engineering stalwarts such as A.N. Khosla constantly invoked the projected rate of rise of population at '2%' per annum. When combined with an increase in the standard of living as a result of industrialisation would ensure that the per capita demand for food and water would continue to rise<sup>27</sup>. But with modern technology for 'conservation and utilisation of water resources' making rapid strides; the problems of agriculture and irrigation could be easily met. Thus, if development was not jumpstarted through extensive water resource development, scarcity would no longer just remain a threat. These visions of scarcity are axiomatic in two ways:

- a) The ability of science and engineers to forewarn such a possibility due to the exact nature of their science and scientific method.
- b) The need for planned development to ensure that fragile and unreliable natural resources can be trained into reliable flows and maximum returns.

The need of the hour, therefore, was planned development to yield maximum returns. Without large multi-purpose dam projects to control floods, manufacture electricity and provide water for irrigation, and utilise an 'inexhaustible source of

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<sup>27</sup> A.N. Khosla, "Central Water and Power Commission: April 1945 to April 1970," in *Central Water & Power Commission (CWPC) Silver Jubilee Souvenir* (New Delhi: Ministry of Irrigation and Power, Government of India 1970), 15.

water supply in the form of rainfall', else all that water would go to 'waste'<sup>28</sup>. In this linear, almost mathematical, rendering of development, rivers came to be understood as basins whose development had to be absolute in order to minimise 'wastes'. Indeed, immediate concerns were food and large dams. It was increasingly argued that large multi-purpose projects would hold back enough water for irrigation during the dry season as well as produce enough electricity for irrigation and industrialisation.

As Dhir remarks:

The cessation of war [World War II] brought in more undertakings of an ambitious nature aiming at a satisfactory solution of food shortage. This fact, coupled with the frequent devastating floods that repeatedly brought miseries, disease, loss of life and property especially in the major rivers like the Damodar, Kosi, Mahanadi and Brahmaputra, was responsible for a notable change of policy on the part of the Government of India in helping the provincial Governments in the investigation and construction of major schemes with the purpose of control of floods and utilisation of resources for development of irrigation, power generation, navigation, etc. This has been responsible for the utilisation of water resources for more than one benefit, and the projects are now popularly known as multi-purpose projects.<sup>29</sup>

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<sup>28</sup> A.N.Khosla, "Central Water and Power Commission," 15.

<sup>29</sup> R.D. Dhir, "Water Resource Utilisation in India: A Brief Review," *Indian Journal of Power and River Valley Development* 9 Numbers 6 & 7 (June- July 1959, CW& PC Special Number), 51.



More importantly, however, these projects would meet the pressing needs of the country.

‘Keeping in view the need of the country, priority has been accorded to projects likely to yield additional food at an early date. Large multi-purpose projects have been phased with a view to an early completion of their irrigation aspect’.<sup>30</sup>

There was however, a realisation that hydrology wasn’t at as exact a science as it should be. Through exact measures of stream currents, channel behaviour, sedimentation studies, rivers could be ‘trained’ into the reliable resources. Such exact information was gathered through a ‘network’ of gauging studies across the country so as to get a fair indication of the resources ‘wasted’ by the nation’s rivers as they flowed to the sea — untamed and unproductive. As K.L. Vij while commenting on hydro-electric resources in India emphatically states: ‘[E]ssentially the problem is simple, in that it resolves itself into an examination of the possibilities of utilizing “available water supplies” at the maximum possible head’<sup>31</sup>. It was only through such a thorough examination that entire river basins could be revealed as measures of water resources. As the later sections will show, basin wide development came to occupy a central theme in engineering imagination for rivers.

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<sup>30</sup> R.D. Dhir, “Water Resource Utilisation in India,” 51.

<sup>31</sup> K.L. Vij, “India’s Hydro-Electric Resources and Their Assessment, ” *Indian Journal of Power and River Valley Development* 9 Numbers 6 & 7 (June- July 1959 CW& PC Special Number), 64.

## Planning for basin wise integrated development

Planning came to occupy a central place in the developmental imagination. This was especially true of post colonial India. In fact, planning for independence began nearly a decade before independence in 1938 when the National Planning Committee was founded<sup>32</sup>. Scholars have pointed out that the exercise of planning and five year plans based on the Soviet model was in fact the triumph of the Nehruvian vision for India over the Gandhian one. Others have pointed out that the dichotomy between these two visions is an excellent starting point to analyse the process of planning and development as it transpired in independent India. Klingensmith in his study points to the many machinations that seasoned politicians and highly regarded scientists such as Meghnad Saha had to undertake in order ensure that DVC was brought to fruition<sup>33</sup>.

In his study of the events in the Mahanadi delta around the coming of the Hirakud Dam, D'Souza argues that emergent bureaucratic management had to create acceptance for the TVA idea in India. In doing so, D'Souza briefly mentions the oncoming bureaucratized notion of rivers, specifically looking at the 'production'<sup>34</sup> of a river through a series of technological interventions. By the time independence was achieved in 1947, bureaucratized technological river conservation and training was a well accepted reality in India. However, since irrigation and any scheme of water

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<sup>32</sup> Satyajit Singh, *Taming the Waters: The Political Economy of Large Dams in India* (New Delhi: Oxford University Press, 1997).

<sup>33</sup> Daniel Klingensmith, *One Valley and a thousand*, 109-154.

<sup>34</sup> D Souza argues that the introduction of the Multi Purpose River Valley Development and the subsequent construction of the Hirakud Dam should be understood as the colonial state's attempt at 'producing' the river to craft an altogether new equation for social and economic power i.e. the appropriation and transformation of nature into a means of production. For a more detailed discussion see Rohan D'Souza, "Production of the River," in *Drowned and Dammed*, 182-225.

resource development was part of the Provincial list of the Government of India Act of 1935, a central body like the CWINC could not afford run roughshod over the provinces. While the means through which the CWINC and centrally administered water came to be constituted would be a deviation at this stage, it would suffice to say that by constituting the nation state as the object of development, it was possible to eschew political and social exigencies<sup>35</sup>. Water resource development sought to rearrange rivers into units of basins instead of geographies or people. Such a unit like the larger unit of the nation state was comparable, and internal. Political division of states had to be overcome in order to ensure 'optimum' development of the nation state as a whole.

Constituent individual river basins therefore, divided the nation. Like the larger unit, these smaller units were legible and modular. Rivers then were instrumental in the development project. However, these individual rivers themselves, as singular units, could no longer be treated as individuals; through basin – wise development, they would be units of a whole. Indeed, basins instead of rivers across states were far more pliable to national development not to mention removed from regional factionalism. As a technological solution to the problem of optimum resource utilisation rather than regional sharing, rivers and landscapes could be re-ordered apolitically. As Kanwar Sain clearly charts out a course for the same:

To make effective use of waters for irrigation, navigation, power and other allied purposes, it is necessary that a careful and unified development of the whole basin is planned irrespective of that number

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<sup>35</sup> The next chapter will chronicle this process in an effort to understand how the 'development apparatus' constitutes a specific kind of knowledge while delegitimizing others.

of States or Provincial boundaries that may be involved. It is only for this manner that optimum utilization of resources of the entire watershed can be made and waste of any potential resources of the valley eliminated. If the entire basin is not developed as a unit there is the possibility of confusion arising when each State starts controlling the river from its own point of view.<sup>36</sup>

Sain of course wasn't the lone supporter of a basin based approach. Some of the many voices are those of M.L. Sood, A.N. Khosla and S.K. Jain:

Practically all the river systems of the country run through more than one State. Their balanced development in the interest of navigation and other objects, e.g., irrigation, hydro-electric power and flood control, demands that the entire valley is treated as one unit irrespective of State boundaries.<sup>37</sup>

Modern technology for conservation and utilization of water resources is making rapid strides. With a unified and integrated approach to the development and utilization of surface and ground waters and to problems of agriculture and irrigation, this challenge (of looming resource crunch and a steady population rise) can be met.<sup>38</sup>

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<sup>36</sup> Kanwar Sain, "Developing India's Water and Power Resources," 37b-c.

<sup>37</sup> M.L. Sood, "Inland Navigation in India," 52

<sup>38</sup> Dr. A.N. Khosla, "Central Water and Power Commission," 14.

It has been well recognised that river basin should be considered a single unit for development of water resources.<sup>39</sup>

Repeatedly thus, a basin-wise approach was invoked as the most efficient means to herald development. Marking a radical break from the earlier 'compartmental' approach to one based on unified basins would envisage the development of,

[T]he water and power resources of a region, basin and sub-basin and the transfer and interchange of both water and power between regions, basins and sub-basins in the overall interest of the country and regions concerned.<sup>40</sup>

These arguments shored up well as the basis for a 'National Water Grid' — an idea first proposed by the famous colonial engineer Sir Arthur Cotton in the 19<sup>th</sup> century to ensure navigability and irrigation for all parts of India in addition to being an alternative to the railway network then under development<sup>41</sup>. Parts of that inter-linking project were carried out in the form of the Orissa Irrigation Company and the Madras Irrigation Company — to disastrous consequences. This prompted a roll back on the scheme and the railway expansion pressed on. Its 21<sup>st</sup> century, post independence avatar, saw the idea being promoted as means to ensure the excesses of one river could replenish the lows of another:

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<sup>39</sup>S.K. Jain, "Problems in Irrigation Development in India," in *Central Water & Power Commission (CWPC) Silver Jubilee Souvenir* (New Delhi: Ministry of Irrigation and Power, Government of India, 1970), 181.

<sup>40</sup>Dr. A.N. Khosla, "Central Water and Power Commission," 12.

<sup>41</sup>Daniel Headrick, *The Tentacles of Progress: Technology Transfer in the age of Imperialism, 1850-1940* (New Delhi: Oxford University Press, 1988), 20.

Large areas in Western, Central and Southern India have a very low rainfall while in the Northern and Eastern regions heavy monsoon rains cause extensive floods and large volumes of water flow waste to the sea. The National Water Grid has been conceived for remedying this imbalance to a certain extent by transferring waters from surplus regions to deficit areas by interlinking the various river basins so that transfer of water becomes possible.<sup>42</sup>

Such a national grid would connect the Arabian Sea, the Bay of Bengal and the Ganga-Brahmaputra basin 'through necessary deepening of river channels and construction of dams, reservoirs and navigation locks along the Narmada, Mahanadi, Godavari and the Ganga river systems over the central Amarkantak plateau'<sup>43</sup>. This 'unified and integrated' approach was 'endorsed' by committees set up by the GOI in 1957 and 1967 to review the functioning of the CW& PC<sup>44</sup>. Rivers, as a consequence, came to be assembled as units that could be rationally developed for maximum usage through multi-purpose projects. The natural world came to be arranged as a system of excesses and lows which could be corrected with mathematical precision to yield steady, uniform returns. These units could be compared. Engineers often compared the complete development of these units across geographies; comparing projects in India to those in the US and/or the Soviet Union:

'... projects like this (i.e. interlinking of rivers) have been carried out in Russia, where they have linked up the Volga and the Don rivers,

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<sup>42</sup> Dr. K.L. Rao, *Cusecs Candidate: Memoirs of an Engineer* (New Delhi: Metropolitan Press, 1978), 104.

<sup>43</sup> A.N. Khosla, "Central Water and Power Commission," 12.

<sup>44</sup> A.N. Khosla, "Central Water and Power Commission," 12.

thus establishing through navigation between the Baltic, and the Sea of Azov and the Caspian Sea'<sup>45</sup>.

To the post independence engineering mind, the National Water Grid was not a possibility but a certainty; the question was when it would become reality: '[T]hese policies will have to be implemented sooner or later for the survival and prosperity of our country'<sup>46</sup>. There is another consequence of this approach: the need for an unbiased body to help resolve inter-state water disputes. By eschewing state boundaries in the larger project of basin wise development, inter-state disputes would become problems of the Central Government that needed a technical body to arbitrate as the 'Chief Technical Advisor'<sup>47</sup>. Such an advisor would ensure that 'unbalanced development' of river basins would be corrected by calling on the Commission to 'play an ever-increasing mediatory role for exploitation of the rivers for the overall benefit of the country'<sup>48</sup>:

One of the important functions of the Commission is to act as the advisor to the Government in planning the systematic exploitation of the country's water resources and resolving disputes relating to the division of river waters which flow through more than one state.<sup>49</sup>

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<sup>45</sup> A.N. Khosla, "Our Plans," *Indian Journal of Power and River Valley Development* 1, No. 7 (June 1951), 2.

<sup>46</sup> Dr. K.L. Rao, *Cusecs Candidate*, 100.

<sup>47</sup> S.K. Jain, "25 Years of CWPC— A Historical Review," 20.

<sup>48</sup> S.K. Jain, "25 Years of CWPC— A Historical Review," 20.

<sup>49</sup> M.D. Mithal, "Central Water and Power Commission: Retrospect and Prospect," *Indian Journal of Power and River Valley Development* 9, Nos. 6 & 7 (June-July 1959, CW&PC Special Number), 38a.

As the sole technical arbitrator, the CW&PC would ensure that river resources would not be 'wasted'. More importantly however, such scaled up and planned development of entire river basins would ensure that agriculture and rural life would be benefitted. As Kanwar Sain recalled:

Also at present in large areas of the country only one crop can be grown per year during or after the monsoon rains. With adequate irrigation facilities two crops can generally be grown and in some places even three. With assured irrigation supplies the cultivator has the incentive to improve his method of cultivation, use improved seeds and manure and practice crop rotation. Supply of irrigation can thus change the entire agricultural pattern of large regions for the better of the country.<sup>50</sup>

In addition to changing agricultural patterns it was argued that in a country where over 80 per cent of the population lived in rural areas at the time, the real beneficiary 'should' be the common man<sup>51</sup>. Through the rural electrification programme, it was believed, the 'common man' would now be able to enjoy the benefits of electrification in villages to meet his agricultural, cottage industry and personal needs. This project though was not the Gandhian ideal of village republics but instead a component in the Nehruvian vision of India. Electrified villages, more so farmers, now able to use pump sets to irrigate their fields, would no longer depend on the

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<sup>50</sup> Kanwar Sain, "Developing India's Water and Power Resources," 37b.

<sup>51</sup> Rural electrification became a benchmark of the expanse and success of the power transmission network. See A.P. Seethapathy, "Impact of Rural Electrification on the Common Man," *Indian Journal of Power and River Valley Development* 20, No.3 (March 1970 CW&PC Special Number),141.



‘vagaries of the monsoon’. The pumping facilities would have ‘guaranteed water supply for his cultivation needs’. With inputs of fertilisers to further help crop yield, the farmer would enjoy an exponentially rising yield. At the same time, he would be blessed with decreased use of animal and labour power. Through the twin processes of increased machine and fertiliser use and decreased animal and labour inputs, the farmer would have additional income which could be used to further modernise agricultural practices. Technology thus, would emancipate the farmer and ensure all around economic progress and modernise the village life<sup>52</sup>.

This ‘modernization’ of village life however, had another goal. To increase rural electricity demand. Increased electrification and demand for pumpsets would drive overall demand for electricity in rural areas. According to A.P. Seethapathy, the rural electrification programme reached out to 69,991 villages in March 1969; in March 1951 (when the project began) 3,623 villages were electrified<sup>53</sup>. During the same time, the number of pumpsets went up from 18, 709 in March 1951 to 10, 88, 174 in March 1969. This increase however, would put some pressure on State Electricity Boards to ensure that the pumpsets were connected to the grid.

In his description of high modernism through the example of the Tennessee Valley Authority, James Scott dwells on the various negotiation and bargaining techniques through which David Lilienthal and Andrew Morgan went about creating a market for the electricity that would be generated by the TVA programmes. The rural electrification programme is reminiscent of the TVA programme to increase rural demand. In India, however, the problem was far more magnified — since there was

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<sup>52</sup> A.P. Seethapathy, “Impact of Rural Electrification on the Common Man,” 141.

<sup>53</sup> A.P. Seethapathy, “Impact of Rural Electrification on the Common Man,” 141.

no demand for electricity itself, let alone privately or publicly generated, the task was to actually create demand. In moving beyond its urban milieu, development could now realistically stake claims at being an egalitarian process.

In sum, basin-wise and basin-wide development would ensure that rivers could be developed to the maximum. This could be managed only if the process was arbitrated by the technocracy, which was imagined as being able to eschew political and social boundaries. The National Water Grid would render the riverine landscape entire legible, open for complete development. Scaled up and extensive basin wise development would ensure that agricultural processes would also change. Increased irrigation facilities would change cropping patterns. More importantly however, it would ensure that rural development was jumpstarted, with electrification programmes. In addition, the increased use of pumpsets in agriculture would mean that farmers would be able to employ less manpower and increase productivity.

### **Rivers as datasets**

Rivers, therefore, came to be ordered as calculable, comparable units which when developed optimally would help eradicate poverty and the looming resource crunch. At the same time, by treating river basins as units that could be developed, there were no limits to nature's instrumentality. Long histories of hydraulic manipulation in the subcontinent help anticipate a unique national space for development. The need for planning to ensure this manipulation could achieve all its goals; comparisons to propagate the modularity of this development apparatus and process used to fix the nation state as the object of development. Rivers were therefore manifested as prospective models that could be reproducible; a function of

heads and cusecs. The development apparatus thus acquired 'the character of calculability'<sup>54</sup> that mediated between material realities and the abstractions of science and politics. Numerical indicators came to speak for themselves; tangible enough to mould facts.

As reproducible units across landscapes that were framed and solved technologically, rivers came to be organised in a linear fashion. This linearity set up arguments in favour of dispossession in the name of 'development'. Post 1947, India came to be characterised by gargantuan projects whose epitaph is populated by numerous dispossessed peoples still seeking a place in the mainstream development narrative. In couching arguments for large scale development in numbers and as purely technological processes, other forms of knowledge were delegitimised. Technological impetus came to occupy a centrality in post colonial India. The making of a national place for development through large scale hydraulic manipulation, as the narratives above chronicle, came to be recognised as seminal parts of the process of modernity that India had long been denied. By disempowering local place vis- a-vis national space, the narrative of development was easily tied to the project of nation building.

In the 'development' discourses by engineers, thus, India was presented as the possessor of an economy which was defined in national terms but also responsive to national government policy. As the narratives above show, the national economy tended to be seen as something that came about as a result of 'development' planning and projects; a lack of 'development' was a problem of government neglect.

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<sup>54</sup> Timothy Mitchell, *Rule of Experts*, 92.

The trajectories cited above have helped establish the different rationales of the development narrative as deployed by the technocracy. This narrative however has consequences for the way government is imagined. The notion of development ensconced in the writing above doesn't necessarily assume absolute governmental control. It does however produce analyses in which, elements under state control are determinant, while those lying beyond are secondary. For instance the Indian economy was represented as a reflection of state policy, which reserved an extraordinarily important place for policy and 'development' planning.

The technocracy itself, on the other hand appeared (and represented itself ) as a machine that implemented 'development' programmes whilst being an apolitical agent. Indeed the technocracy came to be seen as a tool that worked towards delivery of social services, agricultural inputs and 'engineering' economic growth. From the snippets above, the image invoked is one of a singular, unitary entity that is tackling an equally coherent enemy. The enemy, in this case nature or population growth etc. could be coded and destroyed in a technical manner. However as a process of social transformation more than anything else, development was constantly confronted with political questions about class, corruption and 'inefficiencies' of the development apparatus. Unable to deliver its promises, the very questions that development had sought to avowedly avoid came to haunt it. Indeed problems of the bureaucracy too were seen as problems of organisation and not political ones. The logic was that the development apparatus, like the ordered and planned economy, would respond to planners and their plans. The state's politics did not form a part of this narrative, except for its renunciation. As Desai in the beginning of the chapter is quoted, politics

was conspicuous by its absence. It is interesting to note how terms such as ‘the people’, ‘the common man’, ‘decision makers’ etc. are used so unproblematically and without qualification. It is assumed that society is more or less an undifferentiated mass that can be moulded by the developmental processes.

In conclusion, India as represented by these narratives was far removed from the very societal processes that were to be solved. The political and structural reasons for poverty and population over-growth came to be recast as technical problems. This recasting set aside questions of politics and society, instead yielding well to the arithmetic of development. Through the prism of the engineers cited above, India came to be imagined as a primarily agrarian economy, which despite its potentialities — both natural and technological — remained underdeveloped. Indeed it was trapped in its archaic conditions, and lacking basic infrastructure to anticipate development was unable to cope with increasing population demands. Interestingly, however, this construction continues to be produced and reproduced, in the face of progressively increasing and detailed evidence, for particular reasons which shall be explored in the next chapter.

## Chapter III

### Development, alternatives and sustenance

*'Accuracy is always a question of where one stands.'*

- Timothy Mitchell<sup>1</sup>

The preceding chapters chronicled how the technocracy was premised on ideas of modern water and technology as well as how engineers established rationales to arrange rivers as resources across geographies, histories and societies. Essentially, these narratives put forward arguments for a technical bureaucracy leading the planning and development of water resources in India i.e. a hydrocracy. In sum, these narratives contextualised rivers in vacuum, constantly making a case for great technological control. Despite being built on contingent notions, these narratives belie a certain degree of self-assuredness and confidence. This chapter is divided into two sections. The first section concentrates on the grey areas that appear in the narrative of engineers and technocrats despite the impressive and expansive claims. It will highlight how the bureaucracy is not always able to substantiate its many claims. More importantly it will show how claims of accuracy are in fact, estimates that have been highlighted and critiqued by the environmental movement. In addition, it will also show how that these tracts are not internally coherent in themselves. There were just as many questions raised internally as there were externally. These grey areas however, are not engaged with. The second section uses the concepts of the anti-politics

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<sup>1</sup> Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (Berkeley: University of California Press, 2002), 92.

machine and governmentality, in trying to explain how the technocracy achieves stability as well as mutate in times of crisis. The second section thus will be more analytical, drawing upon Partha Chatterjee, James Ferguson and the post-development school to open up the analytical space. In brief, this chapter will begin with alternatives and questions that puncture the seemingly coherent narrative. The second section then opens up analytical possibilities to explain how and why development and the development apparatus are still able to survive.

## Section I

### Making Guesstimates

Engineers such as A.N. Khosla laid out elaborate plans to link up rivers and oceans and 'utilise' water resources completely. However, there was an increasing awareness that there wasn't enough data to base all the plans. As K.L. Vij remarked:

When the position regarding the resources of the country began to be reconsidered after the attainment of Independence in August 1947, it became apparent that there was very little data to enable an accurate estimate of the power potential to the country. Even selection of schemes for immediate detailed investigations had to be done on an 'ad hoc' basis<sup>2</sup>.

Thus, by its own estimation, the CWC and its predecessors had no hard data about river flows or riverine systems to fall back upon while making plans for

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<sup>2</sup> K.L. Vij, "India's Hydro-Electric Resources and Their Assessment," *Indian Journal of Power and River Valley Development* 9, Nos.6 & 7(June- July 1959 CW&PC Number), 64. Emphasis in original.

development. Using A.N. Khosla's 'pioneering' formula to calculate stream flows (based on certain assumptions), the total annual flow through in India was estimated at 1673 km<sup>3</sup>. In 1960 the CW& PC estimated that annual flow was actually 1881 km<sup>3</sup>. It was however in 1987-88 that whilst compiling their publication 'Water Resources of India' that the CWC,

[R]ealised that the [previous] assessment studies made on the basis of observed river flows needed some correction since over the years ground water extraction had increased to a significant extent and the observed river flows were corrected for the additional evapotranspiration that was occurring due to the use of ground water.<sup>3</sup>

A reassessment was carried out in 1989, which estimated annual flows to be 1989 km<sup>3</sup>. Although the number may not appear very different from the number of the 1960s, M.S. Reddy (Member, Water Planning CWC) warned that there were 'significant variations in the case of some individual basins'<sup>4</sup>.

Indeed, the massive plans for river development that were formulated in the 1950s and 1960s were based very little on observed field data. It was only in 1958 that the erstwhile Ministry of Irrigation and Power (now the Ministry of Water Resources) set up a number of gauge and discharge observation stations on the Ganges and its tributaries to assess the flow; similar stations were started on Krishna and Godavari rivers following the recommendations of the Krishna Godavari

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<sup>3</sup>Central Water Commission, *Reassessment of Water Resources of India* (New Delhi: Government of India, December 1999, first published in March 1993), 10.

<sup>4</sup>Central Water Commission, foreword to *Reassessment of Water Resources of India* (New Delhi: Government of India, December 1999 first published in March 1993).



Commission in 1962<sup>5</sup>. In the case of the Krishna basin, at the time of the reassessment study, flow data was available from 1971-72 to 1984-5 — a period of 14 years which was considered sufficient. Interestingly enough the flow data for the Krishna basin has varied significantly, by the CWC's own admission. The table below shows the various assessments to estimate the annual average runoff of the Krishna River.

**Table I: Various assessments for average annual runoff of the Krishna River<sup>6</sup>**

Assessment type	Year	Estimated annual runoff in Mm <sup>3</sup>
First Irrigation Commission	1901-2	84,863
Khosla's Formula	1949	44,923
Technical Committee for the optimum utilisation of Krishna and Godavari (waters based on A.N. Khosla's formula)	1953	46,872
CW& PC survey	1960	57,764
Krishna Godavari Commission	1962	62,784
Krishna Water Disputes Tribunal	1973	67,790

The estimate of the Krishna Water Disputes Tribunal was used as the basis for adjudication of waters amongst the riparian states along the Krishna. The Tribunal divided and distributed the river on the basis of estimated flows. K.L. Rao in *Cusecs Candidate*, expressed deep anxieties about the Tribunal award pointing out that 'on

<sup>5</sup> Central Water Commission, *Reassessment of Water Resources of India*, 10.

<sup>6</sup> Central Water Commission, *Reassessment of Water resources Potential of India*, 25

the river at various points' had begun only after the announcement of the award in December 1973<sup>7</sup>. Rao also observed that the tribunal's assessment was higher than the previous one. However, he pointed out the actual correct assessment 'of the water available based on empirical data will be reached only after 20-30 years'<sup>8</sup>. Till then, assessing the annual flow of the river will be 'a matter of conjecture'<sup>9</sup>.

The case of the Krishna is not isolated. Flows have not always matched estimates. For instance in the case of the Narmada river in western India, as the Narmada Bachao Andolan (NBA) has pointed flows have never matched estimates. The Sardar Sarovar Project was planned in the 1960s and 1970s bearing in mind an estimate flow of 27 million acre-feet with 75% dependability<sup>10</sup>, yet by the CWC's own admission, in 1990, after 42 years of flow data then available, flows (at 75 per cent dependability) past the dam were 22.7 million acre-feet<sup>11</sup>. Just like the Bureau of Reclamation in the United States, the CWC continues to lobby for a higher dam keeping in mind the former instead of the more realistic stream flow. The lack of reliable information has seldom been a deterrent to dam development. If anything, data about river flow in fact was one of the smaller considerations; due social and political situations need to be considered by the development apparatus. The report of the Five Member Report Group set up by the Ministry of Water Resources to discuss

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<sup>7</sup> K.L. Rao, *Cusecs Candidate: Memoirs of an Engineer* (New Delhi: Metropolitan Press, 1979), 153.

<sup>8</sup> K.L. Rao, *Cusecs Candidate: Memoirs of an Engineer*, 153.

<sup>9</sup> K.L. Rao, *Cusecs Candidate: Memoirs of an Engineer*, 153.

<sup>10</sup> Patrick McCully, *Silenced Rivers: The Ecology and Politics of Large Dams* (London: Zed Books, 2001, enlarged and updated edition), 106.

<sup>11</sup> Patrick McCully, *Silenced Rivers*, 106; Central Water Commission, *Reassessment of Water Resources of India* (New Delhi: Government of India, December 1999 first published in March 1993),

various issues related to the Sardar Sarovar Dam, the CWC in a note submitted to the Narmada Control Authority in 1991 acknowledged that:

[O]bserved data whether from 1948-49 to 1969-70 or from 1948-49 to 1987-88 give only a 75 per cent dependable annual yield of around 23 MAF[Million Acre Feet]<sup>12</sup>, and that it is only the addition of the ‘hindcast’<sup>13</sup> data from 1891-92 to 1947-48 that increase that number. Even so the combination of ‘hindcast’ data for 1891-92 to 1947-48 and the observed data from 1948 to 1988 gives a 75 per cent dependable yield of only 24.8 MAF<sup>14</sup>.

However since the development of the Narmada valley was premised on a figure of 27.8 MAF, the CWC justified the same using two arguments. Firstly, it introduced the concept of ‘probability of exceedance [sic]’<sup>15</sup> which gave a figure of 27.9 to 31.1 MAF based on observed data from 1948-49 to 1987-88, as against the annual yield of 22.9 MAF at 75 per cent depend-ability in the conventional sense. The second, by its own admission is:

Hydrology as a discipline, is different from most of the engineering disciplines. Natural phenomena, with which hydrology is concerned,

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<sup>12</sup> One-acre-foot equals the amount of water which would flood one acre to a depth of one foot— 21.6 cubic kilometers

<sup>13</sup> Hindcasting is a method of testing or validating a mathematical model (in this case a hydrological model) by running it for a past time period.

<sup>14</sup> Jayant Patil et al., “Report of the Five Member Group Set Up by the Ministry of Water Resources to Discuss Various Issues Relating to the Sardar Sarovar Project” (New Delhi: Ministry of Water Resources, 21 April 1994),7. <http://www.ielrc.org/content/c9402.pdf> (accessed 21 April 2011).

<sup>15</sup> Exceedance, to put it loosely, is the probability that a certain value is going to be exceeded. Exceedance probability is used frequently in calculating the behaviour of bodies of water as it helps predict the probability that flooding might occur. Thus, it assists in the designs of bridges, dams and swers. The CWC has worked out a table of an expected range of annual yield at 90 per cent probability of exceedance. See Central Water Commission, *Reassessment of Water resources Potential of India*.

though have underlying physical processes, are complex and not amenable, to deterministic approach: They do not lend themselves to rigorous analysis not offer unique solutions as are possible in engineering mechanics. *Since water resource development activity cannot be delayed for want of data of adequate quality and quantity, best judgement has to be resorted to.* In the field of hydrology one has to devise methods to suit the data available and come out with solutions. Accepting a solution in turn needs judgement with due consideration to sociological, economic and political situations<sup>16</sup>.

In other words, the dams on the Narmada and many other Indian rivers (since the CWC used estimates while making plans which were not always corroborated with actual data) were built and continue to be built to store water, distribute and generate power from water that will probably never reliably flow down the river. The failure of these dams, as the anti-dam movement has pointed out, is in some ways, inherent. But such was the imperative of development that contingent and estimated information is better than no information at all. The lack of information would reflect on the contingent nature of expertise being employed to master the environment. As the preceding paragraphs have shown though, numbers could be yielded favourably, provided the right parameters were used. Inevitably, these parameters were technical, thus rendering the questioning illegible. As the paragraph cited from the CWC itself points, in framing the question as a technical one, changing parameters by bringing in

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<sup>16</sup> J. Patil et al., "Report of the Five Member Group Set Up by the Ministry of Water Resources to Discuss Various Issues Relating to the Sardar Sarovar Project," 7.Emphasis added.

concepts such as ‘exceedance’ the attempt is to abstract from the question of efficacy, instead changing it to one of accounting and implementation.

This phenomenon is not unique just to India either. Development on the Colorado River in western USA was based on estimates over a short period of time when the world had witnessed a ‘wet spell’. In 1922, the Colorado River Compact divided up the rights to the Colorado River’s water between the upper and lower riparian states and Mexico, laying the groundwork for the many dams along the Colorado. The Compact assumed, on the basis of 18 years of stream flow measurements that the annual flow of the river averaged 17.5 million acre-feet<sup>17</sup>. According to Patrick McCully, by the 1950s, however, it was apparent that the first two decades of the 20<sup>th</sup> century ‘had been exceptionally wet in the US Southwest’; from 1930- 1952, the Colorado’s average flow was only 11.7 million acre-feet<sup>18</sup>. But accepting this figure, he points out, would have halted the many plans for dam development across the American Southwest. In fact when it was lobbying Congress for funds to build its multi-dam Colorado River Storage Project in the early 1950s the Bureau of Reclamation<sup>19</sup> (BuRec) held up the 17.5 Million acre-feet figure as being ‘*conservative* [emphasis original]’. Thus,

‘[R]ather than scale back its ambitions, however, BuRec simply ignored the new data. BuRec did not admit to the Colorado’s ‘deficit’

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<sup>18</sup> Patrick McCully, *Silenced Rivers*, 106.

<sup>19</sup> The Bureau of Reclamation (BuRec, formerly the United States Reclamation Service) is an agency under the U.S. Department of Interior. It oversees water resource management, operation of numerous water diversion, delivery, storage and hydroelectric power generation projects it built throughout the western United States.

until 1965, when it conceded that the flow was likely to be around 15 million acre-feet<sup>20</sup>.

The numbers, therefore, did not always stack up when it came to large dam projects. But the SSP continues to be built. The political allure of dams and the dam development apparatus will be explored later. What is interesting to note however, is the language of questioning; more specifically, its posture, as a technical question. In order to be a viable question that the technocracy would engage with, the question itself is constituted in the same language of MAFs and flow figures. The example of Narmada showed that even when technical questions are asked, they can just as well be invalidated through creative accounting on the part of the technocracy. A question postured technically, I contend, is less likely to gain public currency and therefore remain out of public<sup>21</sup> view. Thus, on the one hand a technically posed question can be just as easily disengaged with as a non technical one. On the other hand, a technical question is not always accessible to the many publics that anti-dam movements aim to sensitise. The questions then, just like the problem itself, remain knotted up. This knotting up has consequences for the popularity of dams and the continued presence of the development apparatus, as later sections will show. As a strictly technical question thus, like the problem itself, it remains out of access to the public.

If anything, the large dam march has only continued. While the reasons for the continued allure of dams and development projects will be explored later, it is important to point out that questions like the problems themselves were framed

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<sup>20</sup> Patrick McCully, *Silenced Rivers*, 106.

<sup>21</sup> Public here is not used as monolithic and generalizing term. Instead it is used as a term to label the plurality of peoples and public that a dam might reach out to.

technically. In effect, to be viable questions, they had to be technical. However, once posed as technical questions (i.e. in the same language as the development apparatus), they could be dismissed through denial and/or creative account as the case of Narmada showed. More importantly however, this process renders the larger questions about development that the anti-dam and environmental movement have raised, outside the ambit of public view. As technical questions, they seem vacuous and not always able to gain currency vis-a-vis the larger political question about development.

### **Internal Questions**

The singular narrative of development might not seem to have any internal inconsistencies. Based on the excerpts from engineers in the previous chapters and sections, it would not be uncharacteristic to assume coherence. The present section seeks to bring to light questions plaguing the development apparatus and development, *ab initio*. At a time when the idea of development enjoyed much currency, these questions challenged the relevance of development as well as systemic issues such as transparency and efficacy. These questions seek to critically engage with the seemingly linear and unequivocal acceptance of development. Through these questions, a very different understanding of development and its meanings comes to the fore.

M.V. Karantha, the Chief Electrical Inspector of the erstwhile Madras Presidency was an early critic. His indictment of development policy in the March 1952 issue of *The Indian Journal of Power and River Valley Development*, was no

doubt unusual for its time. In his article, he charged that his colleagues built for themselves and for Western observers rather than for India's villagers. He observed that in India, like in other parts of Asia, 'it has been the small tail of urban population that has been wagging the body, the rural population'<sup>22</sup>. In order to realise the true embodiments of democracy, he asked engineers to realise that engineers should utilise their education and training 'not only for own self-advancement but also for the benefit of the common man if democracy is to be real and to survive'. According to Karantha, the common man is the single most important denominator for gauging the efficacy of engineering processes and technology. He said,

[I]f we Indian Engineers are to be praised for what we have done and what we are going to do for our country, obviously the praise has to be for what we have done and what we are going to do for these majority people, the common man.<sup>23</sup>

Unlike some of his peers, Karantha was deeply skeptical about the need to look westwards for technical and educational assistance. He remarked that, '[O]ur economic and industrial problems are peculiarly our own'<sup>24</sup> and therefore the solution too has to be relevant to the unique local conditions. He was particularly critical of western models that are prescriptively and sometimes uncritically imported to India. To quote Karantha at length:

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<sup>22</sup> M.V.Karantha, "The Engineer and the Country," *Indian Journal of Power and River Valley Development* 3, No. 4 (March 1952), 11.

<sup>23</sup> M.V. Karantha, "The Engineer and the Country," 11.

<sup>24</sup> M.V. Karantha, "The Engineer and the Country," 16.



[O]nly if we realise that in the field of technology the problem of India is indeed very different from that of the Western countries whose practice we have been blindly adopting. Ours is a country in which the population has now grown beyond any easily manageable limit. Even our annual increase of population is as much as that of the entire population of some of the smaller nations of Europe. Our resources though not bad are like the property of a middle class man which has got to be divided amongst his dozen children. There is too little to go around to all to enable us to act as if we are engineers living in America. We have no great outside markets for manufactured goods from which we can enrich ourselves for us to act as if we were the rich British or Swiss engineers. It will be a tremendous task to increase our prosperity yearly even to the extent our population is increasing yearly. It is exceedingly stupid and suicidal for a poor man to imitate a rich man. For a similar reason, it is suicidal for us to imitate our poor country the methods which the rich and prosperous Western countries have adopted. We have no tangible proof whatsoever that we can ever catch up with them for very many decades to come<sup>25</sup>.

The need to create models based on western knowledge will be disastrous according to him. Instead of building according to western standards, there is a need to take into account 'the fact that there are 350 million people and 5, 60,000 villages whose standards have to be improved in one day, the impossibility of our ever being

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<sup>25</sup> M.V. Karantha, "The Engineer and the Country," 18.

able to achieve the standards of some of the Western countries we want to imitate here and now, will become obvious'<sup>26</sup>. Development may best be realised through a better understanding of local conditions instead of trying to create, manage and transport models across landscapes. Understandably, he was extremely anxious about centralised bureaucracy:

It seems to be that there is often, for people in our country, a fascination for collecting more power for themselves and to believe that others can never be trusted to do things so efficiently. But more the centralization the less the touch with local conditions which alone are capable of being turned to advantage by way of cheapness and quickness of action, so essential for our country. Engineers sitting far away do not find it easy to tackle endless local problem of varied types. So they insist on standardization, however costly it be. They have also better chances of salaries and promotion, the more the services are centralised. But it is the common man that finally pays for all the costliness, delays and misunderstanding of local problems. Nor is over-centralisation the way to train our people in democracy<sup>27</sup>.

Karantha thus offered a nuanced critique of development as early as 1952; barely a year after the First Five Year Plan was implemented. In his article, where he catalogued the roles and duties of different kinds of engineers; he surprisingly steered clear of hydraulic engineers. In his article however, his anxieties about the extant development model also opened up space for alternatives. In a more focused critique,

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<sup>26</sup> M.V. Karantha, "The Engineer and the Country," 16.

<sup>27</sup> M.V. Karantha, "The Engineer and the Country," 20.

engineer Ram Kishore examined the financial aspects of irrigation works, asking questions of transparency, efficiency etc. rather than paraphrase his arguments, they have been reproduced almost in full, so the reader can read first hand, how detailed and farsighted this critique was.

A large number of irrigation works and other development projects are under consideration, investigation or construction in India. Some of them have been completed. Figures of actual cost in the case of completed projects, and of estimated cost in the case of other projects are usually available with ease, though often very late; but figures of anticipated net profits and other figures for the comparison of different projects are usually not available to the public. They are worked out in Government offices but are not usually published, apparently in order to avoid or reduce criticism.

All estimates and forecasts are in their very nature approximate and liable to prove more or less wrong, or incorrect when the project has been built and developed, more specially when the time of construction and development is long. We all make estimates and forecasts, and it is very important to do so, even if they prove a hundred percent out in the end; only we should try and make our estimates as correct as possible, and also invite suggestions and criticism. All printed literature about Government Projects should be made available to the public, sufficiently in advance of their being sanctioned so that non-government engineers, and others can offer

suitable criticism. This is very important in a democratic country, even though it will to some extent increase work in Government offices. It will most probably do a great deal of good. In the absence of correct information criticism, where made, is usually based on wrong information and does more harm than good.<sup>28</sup>

Through the essay thus, the author exhorts the need for greater transparency in the decision making process with regards to dams. More importantly, the article highlights the inadequacy of actual data when decisions are made and therefore champions a critical engagement with the planning process. In its acknowledgement of data insufficiency and guesstimates, it argues for a more reflexive process of planning and development. Both Karantha and Kishore however point to the centralizing tendency of development processes. And both are extremely unconvinced of the need for such centralizing. If anything, the excerpts point to a more involved, 'democratic' process of planning and development.

Despite a publication span of over forty years, the *Indian Journal of Power and River Valley Development* carried only these two articles on this issue. Critical engagement with the development process seems to have become a progressively unimportant activity. If anything, the voices arguing for more investment in hydropower projects had only increased.

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<sup>28</sup> Ram Kishore, "Financial Aspects of Irrigation Works," *Indian Journal of Power and River Valley Development* 2, No. 5(April 1952), 29-30.

## Section II

### **The undying allure of the large dam**

By the turn of the century, the grand narratives of 'development' had been consistently questioned. The 1970s and 1980s saw the rise of environmental movements across India, specifically those concerned with use of local resources for larger national development. The seeds of Indian environmental movements had been sown through the *Chipko* movement in the 1970s which aimed at saving Himalayan forests from destruction. What made *Chipko* distinctive was that a community rallied in defending its rights over local natural resources. *Chipko* became a forerunner as well as the direct inspiration for a series of popular movements in defence of community rights to natural resources.

Resistance to dam building has a long tradition in India, the first being in 1927 against the Mulshi Dam located in western India, in the erstwhile Bombay Presidency (about 20 kms south-west of Pune). The struggle was a great landmark in the history of involuntary displacement in India. The project, owned by the Tatas was commissioned in 1920. The most celebrated anti-dam protest in India, however, is the *Narmada Bachao Andolan* (NBA) which began as a fight for information about the Narmada Valley Development Projects but developed as a fight for just rehabilitation for the millions of people to be ousted by the projects. The movement had spillover effects, leading to the withdrawal of the Rathong Chu project in Sikkim in 1997 and the Bedthi project in 1998. The Tehri Dam as well as Koel Karo projects were evaluated anew thanks to the rising tide of the anti-dam movement across India.

Through the 1980s and 1990s however, there was an almost parallel movement across the globe, especially in 'developing' countries where involvement of developmental agencies such as the World Bank came to be questioned. In effect, the anti-dam movement acquired an institutionalised and transnational character. As a consequence, the World Bank, especially, was forced to reduce its involvement in big dam projects and adopted various new policies on resettlement, environmental assessment, indigenous peoples and information disclosure<sup>29</sup>. It influenced various other multilateral and bilateral agencies to adopt similar policies of World Bank. In the case of the NBA, the World Bank was pushed to constitute an independent review committee, the Morse Commission. The first independent review of any of the Bank funded projects, the Morse Report indicted the Bank on many counts and tacitly endorsed all the main concerns raised by the NBA. The World Bank was then further pushed to finally withdraw from the project.

Like the NBA, there was a movement opposing the Tehri Dam in the Garhwal Himalayas. First conceived in 1961, construction began in 1978, but finally ended in 2006. Besieged by problems from the start; Soviet technical and financial assistance also stopped in the aftermath of the Cold War. Initially, the Anti-Tehri Dam Struggle Committee enjoyed the support of all local political parties in its demand for the scrapping of the dam. However, over time, the consensus was fractured and the dam construction progressed at a slow pace. According to McCully, the freeze on

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<sup>29</sup> Sanjeev Khagram, *Dams and Development: Transnational Struggles for Water and Power* (Ithaca, NY: Cornell University Press, 2004), 181-90.

government and commercial investment in old Tehri Town due to its impending submergence eventually caused many local residents to give up their opposition.<sup>30</sup>

Despite the questions however, development has continued to find its publics. If figures are anything to go by expenditure on irrigation and flood control increased by nearly 43 times from Rs 459.77 crores in the First Plan to Rs. 11,909.13 crores in the Seventh Plan (1985-90). This expenditure has by no means halted; from April 1991 to March 2007, over Rs 1,42,000 crores were spent on major and medium irrigation Projects in order to increase canal irrigated areas. That investment however did not yield any results, if anything, a reduction in irrigated area in the magnitude of 2.44 million hectares was observed in the same period<sup>31</sup>. Losses from irrigation projects however, unfailingly increased. The losses amounted to Rs. 4.84 crores in 1955-6, escalating to Rs. 56.59 crores in 1967-8. A number that has since only increased. The Sixth Finance Commission in its report commented that aggregate loss on irrigation projects, including interest charges, as projected during the Fifth Plan period (1974-8). However, failing returns from irrigation are not a new phenomenon. Satyajit Singh points out, failing returns, as pointed out by the Irrigation Commission of 1972, were discernable since the 1940s. The best sites for dams had already been tapped by then and a reduction in returns was only natural<sup>32</sup>. In 1951, there were 301

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<sup>30</sup> Patrick McCully, *Silenced Rivers*, 300.

<sup>31</sup> Himanshu Thakkar, "Rs 100,000 crores spent, but no additional benefits: No addition to Canal Irrigated areas for 12 years," *Dams Development and People* 5, Nos. 8-9 (September-October, 2007), 1-7.

<sup>32</sup> Satyajit Singh, *Taming the Waters*, p 102.

large dams in India. 3,858 new dams were added to the riverine landscape, between 1951 and 2000<sup>33</sup>.

What then explains the ways in which water resource development still continues to find currency? I contend that the reasons water resource development and dams continue to enjoy popularity is because the development apparatus generates its own particular knowledge. To put it very simply, I argue that the CWC generated its own form of discourse simultaneously constructing a particular kind of object of knowledge and a structure of knowledge around that object. In their failure large dam projects help further state and bureaucratic power. The avowed denial of politics is helps suspend its effects rather than disengage politics completely.

#### **Planning: leaving political residue**

According to Homi K. Bhabha, development relies on a perpetual recognition as disavowal of difference, a feature inherent to discrimination<sup>34</sup>. Scholars such as Bent Flyvbjerg<sup>35</sup> have analysed development projects and decision making process', with a special focus on vested interests and hidden agendas. Such an explanation, assumes a simple decision-making process with rational and calculating actors with enough power to enforce their will on, or even brainwash, their fellow citizens. Scholars such as Peter Hall have shown that this assumption is not confirmed by case

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<sup>33</sup> Central Water Commission, *National Dam Register* (New Delhi: Government of India, 2009), 15.

<sup>34</sup> Homi K. Bhabha, "Introduction: narrating the nation," in H Bhabha (ed), *Nation and Narration*, (New York: Keegan Paul and Routledge, 1990), 1-8.

<sup>35</sup> Bent Flyvbjerg, "Five misunderstandings about case-study research," in Clive Seale et al., *Qualitative Research Practice*, (New Delhi: Sage Publications Incorporated, 2007), 390-404.



studies of bureaucratic or government decision-making processes<sup>36</sup>. Decision-making in public planning is seldom a process entailing rational actors who deal with singular sets of goals, options, consequences, alternatives; who conduct a cost benefit analysis of each alternative, finally choosing the best available option. If anything, the planning process is plagued by uncertainties about future conditions. In his study, Hall emphasises the role of changing values in society for the creation of 'planning disasters', specifically identifying three main spheres of uncertainty<sup>37</sup>. The first is uncertainty about what he calls the 'relevant planning environment', i.e. the future demand for the deliverables of the project, or about future costs and benefits. The second is uncertainty about decisions in related decision areas, for example events or processes which might affect the demand for or utility of the project in question. The third uncertainty is about future value judgments: hegemonic values in society change, and may simultaneously affect the planning process and/or the decision making process as well as the public opinion criteria that determine the success or failure of a project. Projects that once made sense in one era may not make sense under other circumstances. In some senses, Hall argues, 'shifts in values provide the final explanation of everything else'<sup>38</sup>.

In his analysis of development planning in India, Partha Chatterjee concerns himself with how the technical discipline of planning became an exercise of power. He argues that planning was not only a part of the anticipation of political power by the Congress, it was 'an anticipation of the concrete forms in which that power would

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<sup>36</sup> Peter Hall, *Great Planning Disasters* (London: Weidenfeld and Nicolson, 1980), 187- 249.

<sup>37</sup> Peter Hall, *Great Planning Disasters*, 1-13.

<sup>38</sup> Peter Hall, *Great Planning Disasters*, 10.

be exercised within a national state<sup>39</sup>. Secondly, he says, planning incorporated a ‘body of experts’<sup>40</sup> whose technical and scientific evaluation of alternatives helped resolve political debate. Nehru himself, writing in 1944-5, found the experiences of the Planning Committee as ‘particularly soothing and gratifying’ and a pleasant contrast to the ‘squabbles and conflicts of politics’<sup>41</sup>. This constitution of this expert body came at a time when Gandhian and Nehruvian visions of development were battling for supremacy in the public sphere — the debate was centred on the need for industrialization. The debate itself was resolved politically, ‘by successfully constituting planning as a domain outside “the squabbles and conflicts of politics”’. Indeed by the early 1940s, planning had emerged as an ‘institutional modality by which the state would determine the material allocation of productive resources within the nation: a modality of political power constituted outside the immediate political process itself’<sup>42</sup>. The anti-colonial movement developed an economic critique of colonialism, arguing that the British were an impediment in the development of India: ‘[C]olonial rule had become a historical fetter that had to be removed before the nation could proceed to develop’. This economic critique was thus a foundation on which the new nation state could be cast as the sole represented as the ‘only legitimate form for the development of the nation’.

Indeed Chatterjee argues that a development ideology was ‘a constituent part of the self-definition of the post-colonial state’<sup>43</sup>. This self definition however, also

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<sup>39</sup> Partha Chatterjee, “Development Planning and the Indian State,” in Partha Chatterjee (ed.), *State and Politics in India* (New Delhi: Oxford University Press, 1997), 274.

<sup>40</sup> Partha Chatterjee, “Development Planning and the Indian State,” 274. Emphasis in original.

<sup>41</sup> Jawaharlal Nehru, *Jawaharlal Nehru’s Speeches*, vol. 2 (New Delhi, 1954, ), as quoted in Partha Chatterjee, “Development Planning and the Indian State,” 274.

<sup>42</sup> Partha Chatterjee, “Development Planning and the Indian State,” 276.

<sup>43</sup> Partha Chatterjee, “Development Planning and the Indian State,” 277.

eschewed the inherent complexities in state making processes. The state was connected to the people nation through two connections: through the procedural forms of representative government as well as the programmes of economic development that it directed. But these two processes could easily have contradictory implications in that:

[W]hat the people were able to express through the representative mechanisms of the political process as their will was not necessarily importantly what was good for their economic well-being; what the state thought important for the economic development of the nation was not necessarily what would be ratified through the representative mechanisms.<sup>44</sup>

This contradiction was inherent in the way in which development was cast as the end of a long historical mission. In order to be taken up by the nation state however, this chaotic mission enmeshed in a 'long' history had to be rendered necessarily linear, directed as a stage-wise goal achievement strategy. It also implied that in order to be complete and comprehensive, conscious choices had to be made between short term and long term goals as well as alternatives. To put it differently, development was premised 'upon a *rational* consciousness and will, and in so far as 'development' was thought of as a process affecting the whole of society, it was also premised upon *one* consciousness and will — that of the whole'<sup>45</sup>. In a schema reminiscent of Rousseau's General Will, particular interests had to be subsumed in and be consistent with the whole general interest. Chatterjee, recalls Hegel's logic that

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<sup>44</sup> Partha Chatterjee, "Development Planning and the Indian State", p 277.

<sup>45</sup> Partha Chatterjee, "Development Planning and the Indian State", p 277. Emphasis in original.

universal rationality of the state can be expressed at two institutional levels: the bureaucracy as the universal class and the monarch as the immediately consistent will of the state. While the latter condition was satisfied through the adoption of the republican form of government that vested sovereign will in the head of state, it was the former condition that caused problems. In its transition from colonial to post colonial rule, the new state chose to retain the basic structure of the administrative and armed forces virtually unaltered. But these very structures were the cause of India's underdevelopment, as they fed the colonial economy and therefore were at odds with the goals of 'independence'. In institutional continuation these structures raised questions of legitimacy for the new state. The economic critique of colonialism as cited above paved a way out of this conundrum. A purely economic critique helped bypass questions of institutional continuity as well as establish legitimacy. 'This legitimacy... had to flow from the nationalist criticism of colonialism as an alien and unrepresentative power that was exploitative in character and from the historical necessity of an independent state that would promote national development'<sup>46</sup>.

Chatterjee contends that the Indian state's approach to development policy as bureaucratic function was outside the normal processes of representative politics. In effect, planning was 'the domain of the rational determination and pursuit' of universal goals, 'a bureaucratic function, to be operated at a level above the particular interests of civil society, and institutionalised as such as a domain of policy-making outside the normal processes of representative politics and of execution through a developmental administration'<sup>47</sup>. According to Chatterjee, this rational determination

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<sup>46</sup> Partha Chatterjee, "Development Planning and the Indian State," 279.

<sup>47</sup> Partha Chatterjee, "Development Planning and the Indian State," 279.

and pursuit of universal goals requires a definitive self-deception that is indeed possible to fully know everything about the objects of planning:

Planning, as the concrete embodiment of the rational consciousness of a state promoting economic development, can proceed only by promoting economic the objects of planning as the objects of knowledge. It must *know* the physical resources whose allocation is to be planned, it must *know* the economic agents who act upon these resources, *know* their needs, capacities, and propensities, *know* what constitutes the signals according to which they act, *know* how they respond to those signals... The state as a planning authority can promote the universal goal of development by harnessing within a single interconnected whole the discrete subjects of power in society. It does this by turning those subjects of power into the objects of a single body of knowledge.<sup>48</sup>

This is where, Chatterjee contends, the self-deception occurs. In casting development as a purely technological enterprise, the state is ignored as a site in 'which the subjects of power in society interact, ally and contend with one another in the political process'<sup>49</sup>. Therefore, while development planning in India was constituted as a field elevated above the particular interests in society, planning authorities themselves 'are objects for a configuration of power in which others are subjects'<sup>50</sup>. This is indeed the paradox which a science of 'planning' cannot unravel

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<sup>48</sup> Partha Chatterjee, "Development Planning and the Indian State," 281.

<sup>49</sup> Partha Chatterjee, "Development Planning and the Indian State," 282.

<sup>50</sup> Partha Chatterjee, "Development Planning and the Indian State," 282.

from within its own disciplinary boundaries, 'the very subjects of social power which the rational consciousness of the planner seeks to convert into objects of its knowledge by attributing to them discrete capacities and propensities can turn the planning authority itself into an object of their power'<sup>51</sup>. Thus, in talking about the state, attention must be given to both these domains — of rational planning as situated outside of the state and of social power exercised and contested outside within that process — as its constituent fields, situating them in relation to one another.

The political process, from the perspective of planning is an externality, whose strategic possibilities must be objectified and known as parameters. But since omniscience is impossible, planners attempt to secure adequate information and produce a 'general result in which everybody would be better off'. And yet, in their best efforts to procure adequate information, they 'leave behind an unestimated [sic] residue, which works imperceptibly and often perversely to upset the implementation of plans. This residue, as the irreducible, negative and ever-present 'beyond' of planning, is what we may call, in its most general sense, politics.'<sup>52</sup>

According to some scholars, expert knowledge takes 'what is essentially a political problem, removing it from the realm of political discourse, and recasting it in the neutral language of science'<sup>53</sup>. Such a conception, Tania Li argues, encloses expertise as self-referencing, where a closed and secured 'technical matrix' has been established. Resistance, or failure to achieve the programme's stated aims, she says, comes to be 'construed as further proof of the need to reinforce and extend the power

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<sup>51</sup> Partha Chatterjee, "Development Planning and the Indian State," 282.

<sup>52</sup> Partha Chatterjee, "Development Planning and the Indian State," 282.

<sup>53</sup> Hubert L. Dreyfus and Paul Rabinow (eds), *Michel Foucault: Beyond Structuralism and Hermeneutics* (Brighton: Harvester Press, 1982), 196 as quoted in Tania Murray Li, "Governmentality," *Anthropologica* 49, No. 2 (2007), 277.

of the experts'. Thus, in such a schema, there is a conflict of implementation, rather than a true conflict of interpretations about the ultimate worth or meaning of efficiency, productivity, or normalization<sup>54</sup>.

### **Governmental rationality**

According to Li, '[W]hen power operates at a distance, people are not necessarily aware of how their conduct is being conducted or why, so the question of consent does not arise'<sup>55</sup>. Power in the Foucauldian schema is thus exercised in general through the production of knowledge and through the restructuring of fields of possible fields of action. In this view, thus, power is not merely the capacity to coerce, but is present where individuals act in a voluntary manner in a field of action that is structured in specific ways or where a discourse provides only certain ways of structuring social reality<sup>56</sup>. Morgan Brigg in his essay 'Post-development, Foucault and the Colonisation Metaphor', argues for the 'relevance of Foucault's relational conceptualization of power and recognition that "development" is synthetically bound with biopower, which operates by bringing forth and promoting, rather than repressing, the forces and energies of human subjects'<sup>57</sup>.

In order to improve populations the state requires the exercise of what Foucault identified as a distinct, governmental rationality i.e. governmentality which refers to a way of thinking about government as the 'right manner of disposing things'

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<sup>54</sup> Hubert L., Dreyfus and Paul Rabinow (eds), *Michel Foucault: Beyond Structuralism and Hermeneutics* (Brighton: Harvester Press, 1982), 196 as quoted in Tania Murray Li, "Governmentality," *Anthropologica* 49, No.2 (2007), 275.

<sup>55</sup> Tania Murray Li, "Governmentality," 277.

<sup>56</sup> Morgan Brigg, "Post-development, Foucault and the Colonisation Metaphor," *Third World Quarterly* 23, No. 3(2002), 421-36.

<sup>57</sup> Morgan Brigg, "Post-development, Foucault and the Colonisation Metaphor," 422.

in pursuit not of one dogmatic goal but a 'whole series of specific finalities' to be achieved through 'multiform tactics'<sup>58</sup>. This governmental rationality is concerned with

[M]en in their relations, their links, their imbrication with...wealth, resources, means of subsistence, the territory with all its specific qualities, climate, irrigation, fertility, et cetera; men in their relation to...customs, habits, ways of acting and thinking, et cetera; and lastly, men in their relation to...accidents and misfortunes such as famine, epidemics, death, et cetera<sup>59</sup>.

An intervention by experts is needed to then adjust them favourably. Governmentality thus points to calculations and technics that would enable the achievement of optimal results. According to Nickolas Rose, this points a technique insomuch as 'thought becomes governmental to the extent that it becomes technical,' attaching itself to technologies for bringing improved states into being<sup>60</sup>. Thought and technique, thus, together comprise the ensemble of 'institutions, procedures, analyses and reflections, the calculations and tactics' through which governmental interventions are devised, and conduct conducted<sup>61</sup>. However, as Li points out, an explicit, calculated program of intervention is not invented out of nowhere; it 'is traversed by the will to govern, but it is not the product of a singular intention or

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<sup>58</sup> Michel Foucault, "Governmentality" in Graham Burchell, Colin Gordon and Peter Miller (eds.), *The Foucault Effect: Studies in Governmentality* (Chicago: University of Chicago Press, 1991), 95.

<sup>59</sup> Michel Foucault, "Governmentality," 93.

<sup>60</sup> Nickolas Rose, *Powers of Freedom: Reframing Political Thought* (Cambridge: Cambridge University Press, 1999), 5. See also Tania Murray Li, "Governmentality," 276.

<sup>61</sup> Michel Foucault, "Governmentality," 102.



will<sup>62</sup>. It is in fact, situated within and drawing upon, a heterogeneous assemblage or *dispositif* that combines ‘forms of practical knowledge, with modes of perception, practices of calculation, vocabularies, types of authority, forms of judgement, architectural forms, human capacities, non-human objects and devices, inscriptions, techniques and so forth’<sup>63</sup>.

According to Morgan Brigg, the *dispositif* is both a ‘thoroughly heterogeneous ensemble’ of discursive and material elements such as ‘discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions’, and so on- *and* the ‘system of relations...established between these elements’<sup>64</sup>. According to Brigg, this conceptualization is appropriate to the development project because from the late 1940s a range of institutions, funding and resource flows, philosophical propositions about the possibilities and desirability of social change modeled on the West, professional development practitioners, scientific efforts, and government and non-government organizations dedicated to development, all begin to emerge<sup>65</sup>. Brigg goes on to remark that although its elements may not have tight interdependent relations, and while the *dispositif* may generate contradictory effects, it is also able to achieve an overall strategic function. Such a conceptualization thus allows for a

[R]ecognition of both the good intentions of agents and wide range of both positive and negative outcomes generated through development

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<sup>62</sup> Tania Murray Li, “Governmentality,” 276.

<sup>62</sup> Michel Foucault, “Governmentality,” 102.

<sup>63</sup> Nickolas Rose, *Powers of Freedom*, 52.

<sup>64</sup> Morgan Brigg, “Post-development, Foucault and the Colonisation Metaphor,” 426-7.

<sup>65</sup> Morgan Brigg, “Post-development, Foucault and the Colonisation Metaphor,” 427.

while still providing a basis to understand an operation of power which had an effect on the developing world i.e. allowing the flows of power to validate a position other than development is 'bad'. Brigg further argues that the manner in which overall governing effects occur through a *dispositif* can be understood as a macro- level operation of the mechanism of 'normalisation'.

In sum, governmentality can be understood more as an assemblage, moving beyond a monolithic state as the repository of all power. Rather than envisage power as a thing stored in the bureaucratic apparatus and the top echelons of the ruling regime from which it spreads outwards across the nation, and downwards into the lives of the populace, the analytic of governmentality asks 'how different locales are constituted as authoritative and powerful, how different agents are assembled with specific powers, and how different domains are constituted as governable and administrable'<sup>66</sup>. Thus power can be seen to move through the range of institutions that make up the developmental state. According to Foucault, power came to 'statized' thus:

It is certain that in contemporary societies the state is not simply one of the forms of specific situations of the exercise of power- even if it is the most important- but that in a certain way all other forms of power relation must refer to it. But this is not because they are derived from it; it is rather because power relations have come more and more under state control has not taken the same form in pedagogical, judicial,

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<sup>66</sup> Mitchell Dean, *Governmentality: Power and Rule in Modern Society* (London: Sage, 1999), 29 as quoted in Tania Murray Li, "Governmentality," 276.

economic, or family systems). In referring here to the restricted sense of the word *government*, one could say that power relations have been progressively governmentalized, that is to say, elaborated, rationalised, and centralised in the form, or under auspices of, state institutions<sup>67</sup>.

Governmental interventions demand analyses because they have effects. According to Li, although they 'seldom reform the world according to plan, but they do change things'<sup>68</sup>. She adds that they can be resisted only through spaces and positions within power. The analytic of governmentality, she says, 'draws our attention to the ways in which subjects are differently formed and differently positioned in relation to governmental programs (as experts, as targets), with particular capacities for action and critique'<sup>69</sup>. Governmental power, thus, is not homogenous or totalizing. Highly institutionalised practices such as planning, 'operate by attempting to transform contestation over what constitutes improvement, and how the costs and benefits of improvement should be distributed, into technical questions of efficiency and sustain ability'. Yet, as recent scholarship has shown this transformation is not always successful<sup>70</sup>.

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<sup>67</sup> Michel Foucault, "Afterword: The Subject and Power" in Hubert. L. Dreyfus and Paul Rabinow (eds), *Michel Foucault: Beyond Structuralism and Hermeneutics* (Brighton: Harvester Press, 1982), 224.

<sup>68</sup> Tania Murray Li, "Governmentality," 279.

<sup>69</sup> Tania Murray Li, "Governmentality," 276.

<sup>70</sup> James Ferguson, *The Anti-Politics Machine: Development, Depoliticization and Power in Lesotho* (Minneapolis, London: University of Minnesota Press, 1994). Also see Tania Murray Li, *The Will to Improve: Governmentality, Development and the Practice of Politics*, (Durham: Duke University Press, 2007).

## Understanding effects

James Ferguson in *The Anti-Politics Machine* presents a Foucauldian critique of the development apparatus, pointing out that ‘there is no easy congruence between the “objective interests” of the various parties involved and the stream of events which emerge’<sup>71</sup>. Further, he points out that Government services are seldom just services; ‘instead of conceiving this phrase as a reference to a simple to a “government” whose purpose is to serve, it may be at least as appropriate to think of “services” which serve govern’<sup>72</sup>. Indeed Ferguson argues that what maybe most important about a development project ‘is not so much what it fails to do but what it does do’ i.e. its side effects. As Foucault suggests, while dwelling on the failure of the prison,

[O]ne should reverse the problem and ask oneself what is served by the failure of the prison; what is the use of these different phenomena that are continually being criticised; the maintenance of delinquency, the encouragement of recidivism, the transformation of the occasional offender into a habitual delinquent, the organization of a closed milieu of delinquency.<sup>73</sup>

Political effects thus may be realised through the ‘failure’ of a project; effects that may seem invisible at the surface. Failure thus may open ways to understand the deployment of the development apparatus better, specifically ‘to speak of a kind of

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<sup>71</sup> James Ferguson, *The Anti-Politics Machine*, 14.

<sup>72</sup> James Ferguson, *The Anti-Politics Machine*, 253.

<sup>73</sup> Michel Foucault, *Discipline and Punish: The Birth of the Prison* (New York: Harper and Row, 1979), 272.

logic or intelligibility to what happens when the “development” apparatus is deployed— a logic that transcends the question of planners’ intentions’<sup>74</sup>. The side effects of a development project might thus be seen better as ‘instrument-effects’ [i.e.] ‘effects that are at one and the same instruments of what ‘turns out’ to be an exercise of power’<sup>75</sup>.

As the previous chapter has shown, for the engineers and planners who sought large dams, the aims were clear: boosting agriculture, reducing poverty. If anything, the expansion of government i.e. politics was seen as a process antithetical to development. A sentiment that was very overtly visible in some of the claims made by them to lobby instead for an apolitical, technical body that would be best suited for the onerous project of development. In effect Ferguson suggests that if development projects are considered as instruments for the expansion and entrenchment of state power, then the promise of development becomes an entry point for a very different kind of intervention.

The development apparatus, in a sense then is not a mechanism for heralding development as much as a means to reinforce and expand state bureaucratic power. The intervention thus launched may do very little to alleviate under-development and poverty; if anything it may have more concrete invisible effects than those intended. However, it must be emphasised that these invisible effects may not (indeed they seldom are) be a part of planners’ intentions, ‘but resultant systems have an intelligibility of their own’<sup>76</sup>. Though it might be easy to smell a conspiracy here, it is

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<sup>74</sup> James Ferguson, *The Anti-Politics Machine*, 255.

<sup>75</sup> James Ferguson, *The Anti-Politics Machine*, 255.

<sup>76</sup> James Ferguson, *The Anti-Politics Machine*, 256.

important to point out that, in most cases, the invisible effects of development projects are reflective of how things work out. But it is precisely because things work out they way they do i.e. development projects can help accomplish important strategic tasks ‘behind the backs of the most sincere participants’ that it becomes obvious why ‘projects should end up being replicated again and again’<sup>77</sup>. The framing of development as a strictly technical problem and avowedly leaving politics out and instead offering ‘technical’ solutions, questions of population, food scarcity were de-politicised. Plans for development i.e. these technical solutions as employed by the bureaucratic apparatus were extremely detailed and visible. It is this simultaneous visibility, detail and de-politicization that Ferguson says can make a development project ‘end up performing extremely sensitive political operations involving the entrenchment and expansion of institutional state power almost invisibly, under cover of a neutral, technical mission to which no one can object’<sup>78</sup>. Thus the depoliticization of development goes hand in hand with the expansion of bureaucratic state power. As Ferguson remarks, the instrument effect, ‘is two-fold: alongside the institutional effect of expanding bureaucratic state power is the conceptual or ideological effect of depoliticising both poverty and the state’<sup>79</sup>.

To state the obvious, development, as described by engineers thus is seldom as unproblematic or linear. In organising development as a technical problem, narratives cited in the previous chapter underscore this implication: development served as the plank on which increasing bureaucratic state power legitimised itself; ‘problems’ were

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<sup>77</sup> James Ferguson, *The Anti-Politics Machine*, 256.

<sup>78</sup> James Ferguson, *The Anti-Politics Machine*, 256.

<sup>79</sup> James Ferguson, *The Anti-Politics Machine*, 256.

stated in particular ways so bureaucracy could counter them through new programmes. In promoting an expert driven development project across geographies and societies that inevitably fails, development agencies further 'etatization'. Ferguson's detailed analysis of the anti-politics machine draws upon Foucault's neologism of governmentality, concluding that the effects of the anti-politics machine can be seen as a means to reconceptualise '[T]he state' as a 'way of tying together, multiplying, and coordinating, power relations, a kind of knotting or congealing of power'<sup>80</sup>.

Li on the other hand believes that the 'co-existence of multiple programs, uncoordinated and possibly contradictory; the expectations generated by programs of improvement, especially when they are institutionalised as entitlements or rights; and the inevitable gap between what programs promise, and what they achieve' is a source of potential insight. Indeed she points out that the possibility of a challenge is one of the risks that planners must consider in their calculations; 'politics is not external to government, it is constitutive of it'<sup>81</sup>. Indeed as Li points out, the exercise of power carries with it multiple possibilities, 'including the possibility of opening up a governmental strategy to critique, and the incitement to act'. Importantly,

[T]he relation of power to its others is not simply a contest of ideas- it is embodied in practices. Thus our exploration of practices cannot stop at those that follow from the prevailing rationality of government, the self-referencing, systematized, sanitized world of plans and documents.

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<sup>80</sup> James Ferguson, *The Anti-Politics Machine*, 273.

<sup>81</sup> Tania Murray Li, "Governmentality," 277.

No space, person or social configuration is a tabula rasa, a clean slate awaiting inscription<sup>82</sup>.

Governmental strategies however operate a distance — a distance that is both ‘constitutional,’ as diverse forms of authority are invoked, and spatial, linking experts at distant sites<sup>83</sup>. According to Rose, it is the rendering of the space to be governed as technical i.e. ‘as an intelligible field with specifiable limits and particular characteristics...whose component parts are linked together in some more or less systematic manner by forces, attractions and coexistences’<sup>84</sup>. Li adds that the practices that constitute an arena of intervention and render it technical are crucial to the formulation and implementation of a governmental program. These are the concerns of the present MPhil project. Insightfully she adds that there are other sets of practices that merit equal concern — ‘informal practices of compromise and accommodation, everyday resistance or outright refusal’ —arguing for an ethnographic study of government. Such a study would be attentive to the practices that form in, around, through or against the plan<sup>85</sup>. The ‘subterranean practices of government’ could help map out spaces of compromise. Such a compromise would entail forms of tacit agreement when rules are broken, the failure to gather information that contradicts the premises upon which an intervention is planned, or the construction of data to demonstrate unerring ‘success’<sup>86</sup>. In conclusion, Li remarks that the effects of governmental interventions and their reception by target

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<sup>82</sup> Nickolas Rose, *Powers of Freedom*, 50 as quoted in Tania Murray Li, “Governmentality,” p 279.

<sup>83</sup> Tania Murray Li, “Governmentality,” 279.

<sup>84</sup> Tania Murray Li, “Governmentality,” 279.

<sup>85</sup> Tania Murray Li, “Compromising Power: Development, Culture and Rule in Indonesia,” *Cultural Anthropology* 14, No. 3 (1999), 1-28.

<sup>86</sup> Pat O'Malley, “Indigenous Governance,” *Economy and Society* 25, No. 3, 311.



populations, need to be teased out from, and situated in relation to, the multiple forces configuring the sets of relations with which government is engaged<sup>87</sup>.

Through the detailed discussion on governmentality and the anti-politics machine, an attempt has been made to offer conceptual tools that could explain the allure of development and the sustenance of the development apparatus. Specifically the attempt has been to understand the enframing of water and water resource development through expertise (and its constant deployment) as a means to study governmental interventions. Simply put, I read the CWC as an anti-politics machine that actively seeks to create an object of knowledge whilst also creating a structure of knowledge around the object. The object of knowledge in this case is water resource development through development of large dams. This section then, seeks to offer a vantage point to better understand the CWC's continued fascination for and ability to build large dams.

Through the two sections, this chapter has sought to underline a few themes — the fact that development processes were not as uncritically accepted as 'devspeak'<sup>88</sup> as the engineered quoted and examined in the previous chapters. Indeed development has faced many questions, both by engineers themselves as well as by the environmental movement. Its unfailing progress however was analysed by the next section. Drawing upon Michel Foucault, James Ferguson and Tania Murray Li amongst others, the first section of this chapter sought to cast development and the development apparatus in new light, arguing that the failures of these dam projects

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<sup>87</sup> Tania Murray Li, "Governmentality," 279.

<sup>88</sup> 'Devspeak' is a colloquial term that is used to explain the particular language used by development professionals especially jargon unique to development.

might in fact open up new spaces for analysis. The stable, singular narrative of development, as shown by this chapter, is more imagined than real. The imagination however has stuck. Section two then, recasts the questions of section one in a new light. Instead of asking questions about efficacy and alternatives, it seeks to explain failures as 'effects'. Thus, the questions become a means to understand the developmental apparatus differently — by pointing to the everyday practices of compromise and negotiation i.e. an ethnographic study of the apparatus. Although these practices themselves are outside the ambit of the MPhil, the questions from section one, outline the possible entry points to study these practices. The questions then, posed by internal and external sources, open myriad analytical possibilities

## Conclusions

This MPhil began with the hypothesis that there is a need to investigate the water bureaucracy in India, beyond evaluations of the 'iron-triangle'. In the process, three different aspects of the hydrocracy have been explored: the organisation of expertise, interventions for water control and as knowledge regimes.

Large dams symbolise water control as well as different types of political capital and moral authority. Control of water has always been based on cultural constructions of water. At the same time the notion of control of water carries in itself values or ideologies<sup>1</sup>. As walls of concrete and steel, dams are more than mere disruptions in the riverine landscape. They are unique technological artefacts; stamps of human technological superiority over nature. Large dams however, have been analysed and critiqued in detail from various angles. Despite their seemingly apolitical nature, large dams are wired politically. Investigating the process of their assembly reveals a whole gamut of ideas — modern water, expert control and national space — that are stitched together to yield a hydraulic bureaucracy.

Ideas about water as an ahistorical, asocial form that was amenable to expert and technical control (i.e. 'modern water') formed a template through which the hydrocracy was able to carry out large scale technological interventions. Engineering narratives drew upon this template to envision interventions on riverine landscapes of a hitherto unknown scale and form. Rivers came to be described in vacuum, devoid of historical, ecological and social contexts.

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<sup>1</sup> Terje Tvedt and Eva Jacobsson (eds), *A History of Water: Volume I: Water Control and River Biographies* (I. B. Tauris, 2006), xx.

As discussed earlier, Anthony Giddens contends that pre modern narratives understood time and place in context of one another. Beginning with modernity, the time-space distancing effectively flattened time and space into distinct entities capable of being measured through instruments. The standardization of time and time-keeping practices helped rewrite the world fundamentally. This distancing thus emptied time of its societal and ecological contexts whilst concomitantly emptying place of its cultural markers. In doing so modernity generated manifold possibilities for breaking constraints of the 'local'. Modernity also cast nature instrumentally. Nature in its instrumentality increasingly became a technical subject; particularly acquiescent to large scale technological interventions. Nature became a 'standing-reserve' (in the Heideggerian sense) that could be engineered for profit. In manipulating nature, technologies do not merely discipline it; they order imaginations about nature. Unpacking technologies reveals their historical, social and political underpinnings; effects. The ordering of nature as a problem of technology rather than a reflection of its societal contexts was seminal to the later project of 'development'.

In India, modernity and colonialism share an indelible link. Colonialism fundamentally altered the extant hydraulic principle, bringing permanence to structures for hydraulic manipulation that was previously unknown. According to scholars such as Rohan D'Souza this 'hydraulic modernity' separated land and water into separate entities in order to further the cause of the colonial regime. The dichotomy of 'land as property' and 'rivers as resources' was pushed by the colonial and post colonial states through a centralised water bureaucracy. Thus, dams transformed 'local' rivers into a 'national' resource that could be engineered for national development.

The idea of nationalism, in its anti-colonial struggle constituted a distinct 'national space' that was able to situate people across societal and political contexts. The 'nation' as a category was crafted and normalised by nationalism. More importantly however, the coming of a unique, bound national space as distinct (and superior) to local place was important for the project of development. Far removed from the contingencies and dynamics of locality, development as was thought of and realised in the post World War II era was premised on 'national' scales. In the case of water resource development, 'modern' water lent itself well to the ideology and process of expert led development. As an asocial, ahistorical quantity, modern water through a particular writing of the 'hydrological cycle' served as a framework for situating interventions as distinctly 'technical'— without fear of producing any radical socio-ecological disruptions. Large dams therefore are not merely technological artefacts; they are ideologically constituted and politically wired by ideas of modern water and expert control.

Engineering narratives offer yet another entry point to study the hydrocracy. These technocratic arguments in their avowedly apolitical location order nature, and regulate flows in distinct and encompassing ways. In post colonial India large scale technological interventions came to be seen as precursors to the 'development'. The making of a national place for development through large scale hydraulic manipulation, came to be recognised as central to achieving the modernity that colonialism had denied India. In engineering tracts, a long history of hydraulic manipulation disembeds the local and anticipates a national scale for water resource development. In doing so, it fixes the nation as the site and object of development. At

a time when the post colonial state was still finding ways to legitimise itself, these narratives, in their constant invocation of a contiguous 'India', gave the state much needed stability. More importantly however, while fixing the nation as the site of development, there was a coupling: development could only be achieved if it was expert led. The hydrocracy presented itself as the most important benchmark of the 'nation's' progress. A burgeoning and complex hydrocracy was therefore indicative of the state of development processes in India. These narratives reflect a sense of pride and purpose about the engineering enterprise and the possibilities it holds for the nascent state.

In order to ensure that the engineering enterprise was fully able to contribute to a robust and developed India, there was a call for developing indigenous expertise. Such expertise was meant to inspire self respect in the engineers of the country about their ability to carry out the large scale developmental projects. It would, simultaneously reduce the need for foreign expertise. As Indians, these engineers were well versed in local conditions and contexts. In addition, engineers were seen as being natural leaders owing to their technical training. In a country where overpopulation and resource scarcity was a real and looming threat, only large scale technological interventions could ensure optimum usage of resources. Rivers in this schema were resources meant to be utilised to the 'last drop' if India were to have any hope of avoiding a resource crunch that would further put the development process back. Tapped from source to mouth, rivers would not flow as much populate man made lakes; the tail of one reservoir would be the beginning of another. Navigability of rivers would be far more reliable, boosting trade and exchange.

The phenomenal scale of interventions planned would push for maximum usage of rivers. Engineers further pushed for a national water grid — to link all the major and medium sized rivers in India into one grid. Overflows from one river would feed others, stabilising flows and standardising them. As a closed system this grid would also give impetus to power sector development, as there would be reliable flows for hydropower generation. This grid however, was premised on basin-wide and basin-wise development.

River basins were units that needed to be developed from source to mouth. Fully developed units would then make a whole. Integrated basin wise development was the only means to ensure that no rivers went ‘waste’ to the sea and India could be insulated from the vagaries of the monsoon. Reliable flows would also allow for sustained returns from agriculture. No longer dependent on the weather, agricultural practices and production patterns would therefore undergo a fundamental overhaul. In effect, rivers became data sets, devoid of social, political and ecological contexts. River development could be modelled and transposed onto situations and landscapes different from the ones in which the rivers flowed. River development therefore was reflective of the status of development of India. More importantly, in its scaled up and basin wide version, river development was modular, transposable and complete.

Despite their self-assuredness, these claims only *appeared* complete and coherent. As an inexact science by engineers’ admission, hydrology was more or less a game of making calculated estimates. If anything, it was only after plans for large scale river development were galvanised across India did actual measuring of stream flow begin to take place. By their own admission, engineers justified these schemes on ad-hoc

estimates. While there was also a show of strength in these narratives of the engineering community presenting itself as one unit. Voices of dissent were nonetheless audible from the onset. These voices constantly asked for a more reflexive, inclusive and engaged process of development.

These voices however drowned quickly in the din of development, not by concerted choice as much as design. In its wiring, the hydrocracy could not afford to engage with critique. The idea of modern water is at the core of the hydrocracy, nurturing its intents and actions on riverine landscapes. Despite its repeated and public failures, the hydrocracy has survived. A distinctive governmental rationality undergirds the hydrocracy, giving it buoyancy. Through a complex set of machinations, the hydrocracy is able to project itself as a comprehensive, cogent, accurate and self assured unit, despite its failures. If anything, failure spurs the hydrocracy to justify greater scales of interventions. These failures, therefore, offer a vantage point to see how hydrocracies uphold themselves.



## Appendix I

### Leading up to the CWC: The Coming of the Big Dam

In Eastern India, the coming of colonialism fundamentally altered the agricultural rhythm and landscape, transforming agriculture from a 'flood-dependent' agrarian regime into a 'flood-vulnerable' landscape<sup>1</sup>; one that is dependent on the construction and maintenance of a network of canals, weirs and dams. As Rohan D'Souza, while dwelling upon the possible connections between colonialism and the hydraulic crisis of the Mahanadi Delta in Eastern India remarks,

[T]he Company's attempt to transit from an occupying army to that of a governing administration in the region inevitably entangled it in the protracted task of attempting to radically overhaul the previous social and property relations and realign it in sync with the new calculus of rule.<sup>2</sup>

In other words, it was incumbent upon the East India Company to reorder the entire pre-colonial and social landscape to render it legible to the new imperatives of the colonial project<sup>3</sup>. The lack of a reliable social base which could anchor its rule as well as the enmeshed nature of property in pre-colonial society and polity made extraction of agrarian surpluses difficult, one that was ingeniously overcome by the idea of flood control. Through the promotion of embankments, floods increasingly became an aberration on the landscape whilst also furthering a much more rigid and

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1 Rohan D'Souza, *Drowned and Dammed: Colonial Capitalism and Food Control in Eastern India* (New Delhi: Oxford University Press, 2006), 2.

2 Rohan D'Souza, "Colonialism, 'Capitalism and Nature: Debating and Origins of Mahanadi Delta's Hydraulic Crisis (1803-1928)," *Economic and Political Weekly* 37, No. 1 (March 2002), 1264.

3 Rohan D'Souza, "Colonialism, 'Capitalism and Nature,'" 1264.

exclusive property regime. Focusing on Eastern India, specifically the Mahanadi delta, D'Souza argues that successive failures of colonial efforts of flood control only seemed to fuel extensions and elaborations of the colonial agenda of hydraulic control. Thus, the failures, he argues, served as catalysts, propelling the onward march of the colonial mission of remaking the delta in the image of a capitalist commodity, with the concomitant re-organization of social, political and economic relations in the area. Regulating the river waters of the delta was part of the empire's task of disciplining its subjects.

While chronicling these events, D'Souza argues that emergent bureaucratic management had to create acceptance for the TVA idea in India. In doing so, D'Souza briefly mentions the oncoming bureaucratized notion of rivers, specifically looking at the 'production'<sup>4</sup> of a river through a series of technological interventions. Satyajit Singh in his analysis of the political economy of large dams in India dwells on the dovetailing of technology and imperialism- the development of Portland cement that could be used for dam, development of equipment that substantially reduced the cost of damming rivers led to the overall interest and sustained impetus to big hydropower in British India. According to Singh, the availability of this technology was a 'logical continuation of their emphasis on civil engineering works, where the sub-systems were developed, while the main system was ignored'<sup>5</sup>. The adoption of large dam

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<sup>4</sup> Rohan D Souza argues that the introduction of the MPRVD and the subsequent construction of the Hirakud Dam in should be understood as the colonial state's attempt at 'producing' the river to craft an altogether new equation for social and economic power i.e. the appropriation and transformation of nature into a means of production. For a more detailed discussion see Rohan D'Souza. 'Production of the River', in *Drowned and Dammed: Colonial Capitalism and Food Control in Eastern India* (New Delhi: Oxford University Press, 2006), 182-225.

<sup>5</sup> Satyajit Singh, *Taming the Waters: The Political Economy of Large Dams in India* (New Delhi: Oxford University Press, 1997), 49.

technology, according to Singh, provided the final break between traditional irrigation science and military-civil engineering.

The seeds of the global model for Multi Purpose River Valley Development (henceforth MPRVD) were first sown in the United States in the early 1930s with the establishment of the Tennessee Valley Authority (TVA) and the subsequent construction of a series of dams on the Tennessee River and its tributaries. By the latter half of the 1930s, the TVA's experience with comprehensive river regulation acquired what James Scott has termed, the 'module' of higher modernism- a pre-packaged project that was considered deployable in other regions of the world<sup>6</sup>. In subsequent years, the TVA dispatched its 'engineers, agronomists, economists, regional planners and scores of scientific and technical staff' with a herculean mission- 'replicating MPRVD in different river basins'<sup>7</sup>. It has been pointed out that the TVA emerged at a time of great machinations- global political realignments place the US in centre stage while New Deal policies as a response to the Great Depression, as well as the demand for public power drove the MPRVD/TVA home in the US.<sup>8</sup>

In his analysis of the Damodar Valley Corporation (DVC), Daniel Klingensmith traces the journey of the DVC, beginning with the early debates, which provided global legitimacy for large dams on an unprecedented scale in political and technocratic arenas. Contrasting the combined political and technocratic vision of the original TVA project with the guiding idea of the Indian DVC, Klingensmith, emphasises the discrepancy between synoptic visions and fragmented

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<sup>6</sup> James Scott. "High Modernist Social Engineering: The Case of the Tennessee Valley Authority," Lloyd.I. Rudolph and John Kurt Jocabson (eds) in *Experiencing the State* (Oxford University Press: New Delhi, 2006), 3-52.

<sup>7</sup> Rohan D'Souza, *Drowned and Dammed*, 184.

<sup>8</sup> Rohan D'Souza, *Drowned and Dammed*, p 186.

implementations, not only in these two but also in most large dam projects, arguing that technocratic projects on such a scale may be impossible. Klingensmith points out that through David Lilienthal, one of TVA's directors and a dominant voice to spell out its meaning, the TVA expressed the leading role of the US in the post-war world. In *Democracy on the March*, Lilienthal identified the 'TVA idea' of promoting production, consumption and growth with patriotism, anti-colonialism and humanism. This was an energy intensive economy marching towards highly developed industrial production, led by a democratic nation which had freed itself from colonial bonds. This was also an economy that was actively exporting the 'TVA idea' to the 'developing' world.

The TVA came to be seen as a model that had to be replicated across the developing world, specifically in India in this case, in order to truly 'develop'. The TVA model finds mention in a lot of official communiqués at this time, especially whilst the question of river valley development was being explored. Eventually, the DVC modelled on the TVA predated the independent India. It also heralded the arrival of the big dam era through the creation of central authorities that managed these projects. The TVA experience was sought to be recreated through the generation and propagation of river valley authorities across the country. As shall be showcased later, this enthusiasm was seen most prominently in the rising technocrats of modern India<sup>9</sup>. Beginning with the DVC, there were many river authorities that were imagined, and some created. This ingestion of the TVA model though was partial and at times, inextricably tied to the larger project of 'development'. As Klingensmith

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<sup>9</sup> Sudhir Sen, "We Need More River Valley Authorities: TVA-I Shows the Way," *Indian Journal of Power and River Valley Development* 3, No. 3 (March 1953), 57-64 & 141.

points out, Indian technocrats and scientists preferred not to import the entire package of the TVA ideology into India but instead selectively imbibed to Lilienthal's ideas. Not only were the natural conditions different, institutional frame of the model was also based on an extremely selective reading. The period of the rise of the TVA model also saw the fall of the British Empire. The rise of one idea and the eclipse of another great one is no mere coincidence. According to Douza, ' when placed against the backdrop of colonial anxieties about empire in the period, this hurried drive for a certain type of centralization and the reckless manner in which MPRVD projects were planned, assessed, and approved suggests the emergence of an altogether different blueprint for influence in the region'.<sup>10</sup> In effect, the coming of the MPRVD signaled a change in the calculus of rule: one that was born out of the complex relationship between Indian capital and the colonial government. Chronicling the events at the time, D'Souza remarks that as early as 1937, the Congress Working Committee of the Indian National Congress (henceforth INC) had established a committee of experts to take the up the questions of MPRVD and industrialization in India. The subject of Indian industrialization had already stirred up strong emotions<sup>11</sup>. According to D'Souza, the constitution of such a body was itself a significant expression of the INC's growing awareness of the urgency to elaborate an economic agenda for the national government. The battle lines, however, were far from clearly drawn, with the political and economic agendas of the above groupings overlapping as often as they are irreconcilably poised against each other in certain arenas.

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<sup>10</sup> Rohan D'Souza, *Drowned and Dammed*, 195.

<sup>11</sup> Daniel Klingensmith, *One Valley and a Thousand: Dams, Development and Nationalism* (New Delhi : Oxford University Press, 2007).

The broadening base of the anti-colonial struggle through the years, forced the colonial government to try and enlist support of the Indian business class, to neutralise them or prevent them, or prevent them from joining the nationalist camp. Indian capitalists, after a sustained period of participation in the anti-colonial struggle, were increasingly alarmed by what they perceived to be a strong drift towards left-wing populism by the leadership of the Congress party. Despite these fears, however, Indian capital still perceived the INC's mass mobilization capabilities as vital towards sustaining pressure on the colonial government to ensure protection to Indian industry, create infrastructure through public investment, and regulate capital, commodity, and labour markets for indigenous business expansion.<sup>12</sup> Meanwhile the Second World War created conditions favourable for the Indian economy- war time production demand encouraging domestic production and expansion industrial activity and employment opportunities. The coming of the Quit India Movement in 1942 precipitated the Bevin- Cripps proposals- Prime Minister Churchill's 'sudden brainwave' of a plan to sidetrack the political crisis in India by implementing a policy of social and economic reform. The proposals themselves suggested that the GOI provide mass welfare measures in India as a strategic manoeuvre to uncouple popular loyalties from the elite leadership of the INC. though the Bevin-Cripps proposals were much ridiculed by the GOI, an immediate off-shoot of their campaign was an increasing awareness amongst official circles that formulating an appropriate public works policy with an emphasis on employment generating schemes such as anti-erosion works, road and building construction would be critical towards addressing

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<sup>12</sup> Claude Markovits, *Indian Business and Nationalist Politics, 1931-1939* (Cambridge 1985) as quoted in Rohan D'Souza, *Drowned and Dammed*, 195.

the imperatives of the new political context. Not unexpectedly, therefore, the idea of MPRVD found quick and ready appeal in this period as a means of generating employment for a great number of labourers in construction activity.<sup>13</sup>

However, the enthusiasm for the MPVRD was reigned by the tricky question of provincial autonomy and inter-provincial coordination. The Government of India Act of 1935 enlisted all schemes dealing with water which included projects for its storage and for power generation was an item in list II of the Seventh Schedule i.e. all works pertaining to water management and allied activities fall under the purview of provincial control. The Act of 1935 virtually debarred the central government from assuming executive authority over provincial subjects or from intervening in inter-provincial matters. Even the Inter-Provincial Council which under Section 135 of the Act could investigate or discuss matters relevant to the provinces was a purely advisory body with no executive power.<sup>14</sup> Provincial autonomy thus, came to be seen as the most significant obstacle in the path of development. As Keith C. Roy, summed up,

[A]lmost the entire field of development lies in the Provincial sphere, e.g. education, agriculture, canals, drainage, embankments, water-power, communications... But post-war development on so ambitious a scale is now contemplated involves strong Central direction, control and coordination in a field which is almost entirely provincial.<sup>15</sup>

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<sup>13</sup> Rohan D'Souza, *Drowned and Dammed*, 182-225.

<sup>14</sup> Rohan D'Souza, *Drowned and Dammed*, 188-89

<sup>15</sup> Keith C. Roy, private secretary to the H.M. Finance, Routine Note, 17 October 1944 in *The Central Waterways and Irrigation Commission*, GOI, FD, PB, File no. 6(1) P/45 (National Archives of India), 18-19.

Simultaneous with the recovery of subjects from the provincial list, the coming of the MPRVD also ushered an unprecedented scale of administrative, legal, and executive intervention. B.R Ambedkar then Member of Labour (1942-6) in the Viceroy's Executive Council, the department responsible for irrigation and hydroelectric power, after surveying the formidable list of obstacles confronting the execution of MPRVD projects arrived at three issues, which, in his opinion, warranted speedy resolution:

- a) To develop a new instrument of executive authority for the regional control and management of projects on rivers flowing through more than one state.
- b) To evolve a definite development approach of water and hydroelectric power resources of inter-state rivers.
- c) To evolve an administrative set-up with a pool of technical experts to development a national irrigation policy and render technical and other services to the provinces.<sup>16</sup>

Thus in the eclipse years of the empire, through 1944-45, the GOI steadfastly took to the task of establishing the centre's superiority over the provinces. But the GOI had to be cautious not to totally run rough shod over regional sentiments whilst also trying to mobilise the latter through dialogue. This balancing act however was seldom successful, with many in the bureaucratic and political wings, often dropped all pretences of such a dialogue. For instance BCA Cook, Secretary, Planning and Development, in an internal communication, underlined that the GOI's impatience

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<sup>16</sup> S. Thorat, *Ambedkar's Contribution to Water Resources Development* (Delhi 1993), 22, as quoted in Rohan D'Souza, *Drowned and Dammed*, 188.



was chiefly motivated by the desire to recover the 'field of development' from the provinces by quickly instituting mechanisms such as supra-regional authorities for the task.

[The] Labour Department have the support of the Planning and Development Department in the proposal to constitute a Central Irrigation and Waterways Advisory Board...*The object is to take over as much responsibility as possible in respect of waterways control.*<sup>17</sup>

Cook however also added that since waterways was a provincial subject, if there was a failure to develop waterways of importance, 'it does not necessarily follow that such failures are to be made good by the Central agency and at the Central cost'<sup>18</sup>. He also stated that, 'the proposals of Labour Department which are supported by the Planning and Development Department constitute an incursion into the provincial field; and Finance Department can only agree to such an incursion being made if it is of a temporary nature and its financial effects are known and limited'<sup>19</sup>. While noting that central liability it was also necessary to define extent, thus the need to secure the approval of the provinces. Without prior consultation with the provinces, Cook feared that '...any Board so constituted would not receive a full measure of support from the provinces, and its proposals, however ably conceived, would not be accepted by the provinces who are responsible for their implementation without a liberal priming of Central finance'.<sup>20</sup> Cook also pointed out that while the Finance

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<sup>17</sup> BCA Cook, Department for Planning and Development, Note, 3 October 1944 in *The Central Waterways and Irrigation Commission*, GOI, FD, PB, File no. 6(1) P/45 (National Archives of India), 11. Emphasis added.

<sup>18</sup> BCA Cook, *The Central Waterways and Irrigation Commission*, 11.

<sup>19</sup> BCA Cook, *The Central Waterways and Irrigation Commission*, 11.

<sup>20</sup> BCA Cook, *The Central Waterways and Irrigation Commission*, 11.

Department would not object to Central assistance during the reconstruction period, ‘..it could not agree to the Board being started in such a way as to render the giving of Central assistance almost inevitable in all cases’.<sup>21</sup> The following day, Prior sent out another note in which, he ‘with the necessary research that I [Prior] have set in hand’<sup>22</sup>, would show the fallacy of Cook’s views. According to Prior, ‘... the constitution does not impose on the Centre so rigid a restriction which, adopted would in my [Prior’s] view most seriously interfere with reconstruction’.<sup>23</sup>

The possibility of a backlash from the provinces still remained a real fear for the central authorities, prompting them to belabor over a language of reconciliation and ambivalence. For instance, as quoted by D’Souza, the viceroy, in one of the very first letters on the subject of the Damodar Valley Corporation implied that the Central Irrigation and Water Advisory Board (CIWAB) sought to ‘advise’ to the provinces on matters connected with drainage and river control. To pre-empt possible doubt, he also added that even in the event of an authority being bested in a supra-regional corporation, the centre would merely ‘consider becoming partners with the Provinces in the enterprise’<sup>24</sup>. Citing section 150(2) of the constitution, which, according to Prior, stated that,

[t]he Federation may make grants for any purposes of India (or some part of India) notwithstanding that the purpose is not one with respect to which the Federal Legislature may make laws. The fact that the

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<sup>21</sup> BCA Cook, *The Central Waterways and Irrigation Commission*, 11-12.

<sup>22</sup> H.C.Prior, secretary to the Government of India, to all provincial governments, Note, 4 October 1944 in *The Central Waterways and Irrigation Commission*, GOI, FD, PB, File no. 6(1) P/45 (National Archives of India), 13.

<sup>23</sup> H.C.Prior, *The Central Waterways and Irrigation Commission*, 13.

<sup>24</sup> S. Thorat, *Ambedkar’s Contribution to Water Resources Development* (Delhi 1993), Appendix II(3), p 166 as quoted in Rohan D’Souza, *Drowned and Dammed*, 189.

Provincial Legislature is under the present constitution the only authority that can make laws governing waterways and Irrigation, is therefore no ground for arguing that under the constitution it is decided that all expenditure in connection with waterways should be borne by provincial revenues. It seems to me abundantly clear why the Constitution made the provision in Section 150 (2). It is impossible to evaluate exactly or even approximately that the benefits of particular operations may be to the Centre, the provinces or the Individual. I take the illustration of waterways as it is in my mind but the matter is one of general principle. It is impossible in the case of waterways of evaluate exactly that benefits is going to overcome to provincial and federal revenues from a scheme controlling the water of a river and providing either for hydroelectric power, irrigation, navigation, flood control or water for industry.<sup>25</sup>

In no uncertain terms thus Prior seems to be clearly laying out terms that as long as the project in question 'benefits' India (without necessarily articulating what those benefits might be) , it can be initiated by the Centre. Already one can see the large category of the nation is being used to understand what and how 'development' might be ingested in due course of time. In a rather long seven page note, V Narhari Rao, Secretary Finance, retorted,

Mr Prior's proposals and arguments suggest that he is completely ignorant of the fact that the allocation of sources of revenue between the Centre and the Provinces made by the Government of India Act

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<sup>25</sup> H.C.Prior, *The Central Waterways and Irrigation Commission*, 13.

1935 is the result of an exhaustive examination by Parliamentary and other important committees which full took into account the fact that the allocation inexistence before 1935 was almost completely rigid and that while the Provinces had an almost inexhaustible field of social development, they rarely had means adequate for full development of their social needs... It is with a view to rectifying these defects that the distribution of sources of revenue was altered and incorporated in the present Government of India Act.<sup>26</sup>

He added,

But the framers of the Government of India Act of 1935 certainly did not anticipate accelerated planning and development on the scale now envisaged by the Government of India nor make the requisite provisions for it in the scheme, e.g., education, agriculture, medical and public health, irrigation, canals, drainage, embankments, water power, communications, i.e. roads, bridges and ferries, waterways, development of industries and mineral development to regulation and development under central control if the Centre so legislates.... But post war development on so ambitious and comprehensive a scale as is now contemplated involves strong direction, control and co-ordination in a field which is almost entirely anomalous from the point of view of all- India planning. In a recent note, Sir Francis Wylie has also rightly doubted whether – “given the existing constitutional arrangements in

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<sup>26</sup> From V. Narhari Rao, Secretary Finance, Note, 17 October 1944 in *The Central Waterways and Irrigation Commission*, GOI, FD, PB, File no. 6(1) P/45 (National Archives of India), 3.

the country- any workable planning for co-ordinating post-war reconstruction as between the Central Government and the British Indian Provinces on the one hand, and the Indian States on other is possible at all". nevertheless it is agree by all that a plan of some kind must be devised even under the existing constitution, but this will be possible only if all the Provincial Governments and the more important States are awakened to a full sense of responsibility from every point of view and to realise the importance of planned economic development of the country as a whole and in order to attain this objective, the necessity for co-ordinated planning.<sup>27</sup>

Commenting on 'Mr. Prior's interpretation of Section 150(2) of the Government of India Act'<sup>28</sup>, Rao quoted Viscount Halifax in the latter's speech in the House of Lords on July 8, 1935 where Viscount Halifax enunciated that,

The purpose of those amendments is a comparatively simple one: it is to correct a situation that has been found to be one of some little inconvenience \* \* \* \* It has therefore been thought desirable somewhat to redraft these provisions in order to make them more elastic; to enable the Centre to make grants, for example, that might arise to charitable purposes in some part of India and so on. The amendment is to give rather more elasticity for purposes that would be

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<sup>27</sup> V. Narhari Rao, *The Central Waterways and Irrigation Commission*, 4-5.

<sup>28</sup> V. Narhari Rao, *The Central Waterways and Irrigation Commission*, 5.

generally deemed acceptable both to the Federation and the Provinces.<sup>29</sup>

Thus, according to Rao, the Section allowed the Centre to make a grant from Central revenues for a specific purpose and not make permanent deviations from the allocation of responsibilities.<sup>30</sup> Rao further pointed out that it would have been better if the request for the Board had come from the states themselves. Rao's parting shot however was particularly scathing,

It seems to me that Mr. Prior is rather making a mountain out of a molehill. The question is not so much what we have the power to do as to what we feel we ought to do and the limits to which we feel that we should do.<sup>31</sup>

The dissent however seemed to fall on deaf ears, as Keith Roy remarked,

[O]n reconstruction I am inclined to think that it is not necessary for us to press the Planning and Labour Departments to consult the Provinces regarding the setting up of this Board at this stage. Although this course would have been more proper, it is quite obvious that there will be plenty of investigation and co-ordination work for a Board of this sort, even though all the Provinces may not make use of it.<sup>32</sup>

There were no comments or engagement with Rao's comments. The Board had to be constituted. There was no stopping the MPRVD; despite the dissenters, in

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<sup>29</sup> V. Narhari Rao, *The Central Waterways and Irrigation Commission*, 5-6.

<sup>30</sup> V. Narhari Rao, *The Central Waterways and Irrigation Commission*, 6.

<sup>31</sup> V. Narhari Rao, *The Central Waterways and Irrigation Commission*, 8.

<sup>32</sup> Keith C. Roy, secretary to the H.M. Finance, Routine Note, 19 October 1944 in *The Central Waterways and Irrigation Commission*, GOI, FD, PB, File no. 6(1) P/45 (National Archives of India), 9.

December 1944 H.C. Prior, Secretary Labour sent out a letter, informing the provinces of the centre's proposal to create another federal agency viz. the Central Waterways Irrigation and Navigation Commission (CWINC). The CWINC, would be headquartered in Delhi and its chief concerns were: a) Irrigation, b) river control c) conservation and control of flood water d) hydroelectric development e) soil conservation f) tidal problems g) navigation. In order to drive home the urgent need for regional cooperation, Prior even enclosed the extracts of J.S. Ransmeir's glowing account of the TVA, which enunciated the immense economic advantages that could follow from coordinated planning over river control.<sup>33</sup> The letter however did not go down well with the provinces; Madras and Bengal were the two strong dissenters while the other nine provinces supported the proposal. That having being voiced however, the Labour Department still went ahead and set up the CWINC, since majority of provinces had agreed.<sup>34</sup>

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<sup>33</sup> H.C.Prior, secretary to the Government of India, to all provincial governments, 8 December 1944 in *Post War Irrigation: Question of a Regional Approach to River Basins and the Role of the Government of India in Promoting It Where More than One Province is Concerned*, GOI, FD, PB, File no. 6(2) P/45 (National Archives of India), 15.

<sup>34</sup> H.C.Prior, *Post War Irrigation: Question of a Regional Approach to River Basins and the Role of the Government of India in Promoting It Where More than One Province is Concerned*, 15.

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