

Framing India's Hydraulic Crises

The Politics of the Modern Large Dam

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For several decades following 1947, the modern large dam in India presented itself as a political conundrum, often voiced in strange, contradictory tones. In an oft-quoted speech in July 1954 Jawaharlal Nehru, India's first prime minister (1947–64), likened the large dam to a “modern temple.” Later, in a less remembered speech before a gathering of engineers and technocrats in 1958, Nehru, as if in contrition, bemoaned the quest for big dams as a “disease of gigantism.”¹

Nehru's contradictory views were, perhaps, understandable for the times. The post-Second World War denouement was unprecedented in several ways. It was a period that left unquestioned the idea of progress, insisted upon the supreme belief in development, inculcated faith in modern technology, and advocated an unwavering confidence in positivist science. How else could one explain the unexpected surprise that greeted civil engineer Dr. K. L. Rao (later minister of irrigation and power, 1963–73) when scouting around for a dam site for the Nagarjunasagar project in the early 1950s in Andhra Pradesh (in south India)? He was troubled by the fact that a police escort was required since the survey zone was then experiencing a communist-led guerilla insurgency, primarily against landlordism. However, as events unfolded, Dr. Rao noted in his autobiography:

Later, I got a letter from the leader of the Communist Party who was underground, that there was no necessity for me to have a police escort and that they would not have harmed me and the other engineers unless we were engaged in building roads to their hide-outs. Engineers dealing with dams and irrigation projects were most welcome. This was similar to what the Communists told Dr. Savage when he went to the river Yangtze in China to see a storage dam site. The Communists sent word to him that he could freely move about without escort as they would not harm engineers engaged in the development of rivers.²

Clearly, the large dam appeared class neutral, if not beyond politics. Such was its apolitical allure that Henry C. Hart, a U.S. academic and

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were transformed into a “succession of water logged morasses” in which “dismal swamps breeding malaria” debilitated the population and the fertility of the soil.

Colonial hydraulic interventions, as it is now widely recognized, oversaw the dismantling and destruction of several unique water traditions in India. This, of course, is not to argue that all “traditional” water practices were ideal, enduring, and environmentally sound. Rather, the emphasis here is to point out that the contemporary model for harnessing water in India amplifies its colonial legacy by continuing to expropriate or eliminate traditional water management skills and technologies. And having thereby relentlessly extinguished other ways, techniques, arrangements, traditions, and cultures for managing and conserving water in India, the large dam is always pursued as the TINA (there is no alternative) option.

Today, globally, according to a recent count, over 45,000 large dams currently sit astride innumerable river valleys, gorges, and “gun-shot” sites.¹⁰ Formerly wild cascading flows are now put to work—running turbines, marching as orderly cusecs in irrigation canals, providing the measured electric hum for industrial machines, and winding their way diligently through drinking water pipes or simply contained as silent volumes in immense reservoirs. The river has been put on tap.

Yet, a dammed river—as I will argue below—profoundly plays out the irreconcilable tensions and intense contradictions between capitalism and nature. Modern large dams, given the experiences in the last sixty years in particular, have been deeply implicated in various processes integral to capitalism such as enclosure, the transferring of hydraulic endowments to powerful constituencies, the intensification of industrial agriculture, the shifting of ecological costs onto marginal communities, and the expropriation and elimination of indigenous water management traditions.

The New Enclosures: When Dams Ate People

In India, disquiet regarding large dams was first expressed over the issue of displacement.¹¹ The multipurpose reservoir, requiring the creation of an artificial lake, drowns vast swathes of existing forests and habitations. Thus, entire villages and settled communities, which fell within the bed of the dam’s reservoir, were forcibly evacuated from their lands and homes. By the 1980s, the number of *oustees* or dam-displaced persons had reached such alarming proportions that the much celebrated *Second Citizens’ Report* (1985) on the growing environ-

mental crises was dedicated “to the dam-displaced people of India.”¹²

Dam-displacement victims were, in fact, doubly dispossessed. On the one hand, all their possible means of livelihood were comprehensively destroyed through submergence, while, on the other, they were systematically denied any meaningful resettlement or rehabilitation. Initially, under the pretence of compensation, the oustees were simply paid paltry cash settlements. In 1984, however, partly following the intense resistance that was building up against the infamous Sardar Sarovar Project over the Narmada River, the official policy on resettlement and rehabilitation was finally compelled to concede the right for a land compensatory package.

Despite this seemingly radical gain, the resettlement and rehabilitation strategy in India continues to act as a new type of enclosure. Armed by the archaic colonial Land Acquisition Act of 1894, the government exercises eminent domain over all land, which can then be seized for anything that is deemed as a “public purpose” requirement. Through such a legal framing, moreover, the dispossessed are also denied any right to either challenge or dispute the government’s definition of what constitutes a public purpose. With their livelihoods thus lost, the oustees are then further compromised.

The implementation of resettlement and rehabilitation programs have invariably tended to address compensation claims by breaking whole communities that previously existed as culturally dense intertwined arrangements into now oversimplified family units. In effect, the deep associations that sustained and secured the viability of various kinds of social groupings (especially that of tribal or *adivasi* communities) are disoriented and rendered instead, by design, into collections of atomized individuals. In other words, the bureaucratic and formal categories deployed to facilitate the economic calculations for resettlement and rehabilitation have led to the forced snapping of deep historical ties, bonds, and cultural linkages that were critical to survival strategies and livelihood means.

Finally, by concentrating all its efforts on estimating economic equivalences to land loss, the resettlement and rehabilitation strategy has ended up ignoring and devaluing an entire range of other subsistence institutions and means such as commonly shared forests, grasslands, streams, tanks, fishing rights, and village commons—a web of natural endowments upon which the landless, the marginal, and the impoverished were heavily reliant.

Clearly, dam-displacement in terms of both the legality of its direct seizure of means of livelihood and in the details of enforced atomization and increasing individual vulnerability amounts to a contemporary version of enclosure. One conservative estimate of the number of people displaced by large dams in India since 1947 is placed at 40 million; with possibly a mere tiny fraction of this huge number of oustees having managed anywhere near meaningful resettlement. Nevertheless, the astounding number of oustees has not in any way deterred large dam enthusiasts from pursuing the Polavaram project in south India, which is expected, by a very conservative count, to displace up to 230,000 people. Not surprisingly, the vast majority of the displaced, once again, will be predominantly tribal or *adivasis* populations.¹³

Benefits and Costs as Political Arithmetic

The large dam is always announced as a techno-economic decision. Typically, therefore, quantification is pursued; which, in the main, boils down to the search for an acceptable cost-benefit ratio for the project. Ideally, the benefits are expected to outnumber the costs. However, the cost-benefit ratio is rarely, if ever, arrived at neatly. In great measure, much of the confusion springs from the contested and political nature of how values and prices are determined.

For India, Satyajit Singh helpfully summed up some of the earliest questioning of the cost-benefit format. In an insightful review of several dam projects, he pointed out that the cost-benefit ratio was invariably a manipulated figure, in which the costs were made to move downwards while the benefits always tended to be overstated.¹⁴ The cost-benefit ratio, not unsurprisingly, has served

hand, and a limited engineering scale (stream flow), on the other. Inevitably the selection of the data sets by the Krishna Water Dispute Tribunal, D'Souza argues, was determined on the basis of political pragmatism and opportunism rather than any pretension to scientific judgement.¹⁶ These studies convincingly suggest that the cost-benefit ratio has been made to operate as a type of "political arithmetic" in which the project was positioned as a neutral technological artifact while all along being directed toward realizing specific political outcomes.

With the subjection of the cost-benefit format to critical scrutiny, therefore, a new definition of the large dam is called for. The large dam is seen as the technical means to realize political outcomes. The dam enables the transfer of a region's hydraulic endowments to already empowered beneficiaries with the costs disproportionately borne by dispossessed oustees and marginal communities.

The hydraulic transfer is affected by the comprehensive transformation of the river's ecology. That is, the river is put to work by being altered into irrigation cusecs, kilowatts for hydroelectricity, and dead storage for flood control. The consequences of this dramatic overhaul in the river's character has been brilliantly discussed in a recent study by Shripad Dharmadhikary.¹⁷ In *Unravelling Bhakra*, Dharmadhikary provides one of the most original discussions on both the cost-benefit approach and the politics of the hydraulic transfer in India, through a reassessment of the much celebrated Bhakra-Nangal Project. This project, made operational in 1963, comprises several dams, reservoirs, inter-basin transfer linkages, powerhouses, and a massive canal network intended to harness the waters of the Sutlej and Beas Rivers (tributaries to the grand Indus River system).

For Dharmadhikary, the impacts of the Bhakra-Nangal Project cannot be evaluated by a standard cost-benefit examination. The project points to win-lose rather than, as widely claimed, win-win outcomes. For instance, from the very beginning, the water availability for the Bhakra-Nangal Project to irrigate 2.37 million hectares was made possible by cutting off a near equivalent amount of supplies for 2.21 million hectares in the Sutlej Valley Project lying in Pakistan.¹⁸ Perennial canal irrigation, furthermore, was intended to initiate India's embrace of the Green Revolution agricultural strategy. The Green Revolution package was essentially aimed at providing a steroid effect in agriculture. Controlled and abundant irrigation became the means for stimulating a constellation of techniques and technologies that were intended to boost crop yields. This profoundly reworked ownership and land tenure patterns

(through consolidation), introduced new input packages (chemical fertilizers, high yielding varieties, and mechanization), and encouraged crop monocultures.

However, the gains from the increased yields, mostly in cereal production, have been clouded by environmental costs. Dharmadhikary notes that waterlogging, salinization, and the deleterious effects on the

marine food webs, destruction of unique salt water ecological habitats, and an inestimable loss in biodiversity.²¹

Hydraulic transfers enabled by multipurpose reservoirs have, however, undergone a further twist in recent years in India. Increasingly, large dams or multipurpose river valley development projects are now redirecting river water for urban and industrial consumption. The brewing conflict over the apportionment of the waters of the *Narmada* River is one such clear instance. Originally intended to “benefit” 29 million people across 8,215 villages and 135 towns in the drought-prone areas of Saurashtra, Kutch, north Gujarat, and Panchmahal, the Gujarat Water Infrastructure Limited has piped the much-awaited flows, instead, to the city of Gandhinagar and oversupplied it to industries in Kutch.²² In the state of Orissa (in eastern India), in November 2007, some 30,000 farmers gathered at the reservoir of the Hirakud Dam (Sambalpur district). Upon surrounding the reservoir they demanded that the government ensure that the waters be committed for irrigation rather than being directed toward industry. Despite the subsequent police action of arrests and beatings the farmers remained firm in their resolve. In fact, ten days after the protest, they reassembled to erect a sixteen-foot-long wall above an underground pipe that had been laid by Vedanta Aluminum to move water from the reservoir to its smelter. The wall has been named the Chasi Rekha (farmers’ demarcator) and has become a major rallying symbol for the farmers to assert their claims over the reservoir.²³

The level of strife and conflict caused by the hydraulic transfer has, in fact, reached alarming political proportions on the Indian subcontinent.²⁴ At the heart of this is the large dam, which is increasingly viewed as the most extreme physical manifestation of the pursuit of supply-side hydrology. In short, since 1947, governments in India, building on a destructive colonial legacy and twentieth-century modernist ideology, have aggressively sought to ascertain and meet water demands through either big-engineering projects or intensive extraction technologies rather than concentrating on localized conservation efforts or on strengthening indigenous water knowledge traditions. Supply-side hydrology has meant that initiatives to ameliorate perceived shortages have been met either by the construction of dams and diversions or by encouraging groundwater mining through electric and diesel pumps.²⁵ Thus, water management in India is now dominantly controlled by centralized water bureaucracies, contractors, private en-

and that this is critical to ecosystem function and native biodiversity. Not surprisingly, therefore, by alienating the river from its natural-flow regime and pushing for extreme water extraction, supply-side hydrol-

