



Dams Induced Displacement and Delusion of Development in India

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Abstract: In the annals of development, large dams have held a dual role. Both praised and criticised for their roles in driving national advancement or displacement and dispossession, respectively. Sources cited include Nehru's renowned 'Temples of the New Age' speech, Rangachari's socio-economic evaluation, Klingensmith's intellectual history, Khagram's transnational analysis, Haines's archival study of citizenship and development, and Vora's account of India's first anti-dam movement. The argument put forth is that the Bhakra-Nangal story goes well beyond a purely technical account of hydropower and irrigation. Global histories of anti-dam resistance, beginning with the 1920s' Mulshi Satyagraha and continuing through the 1980s and 1990s' Narmada Bachao Andolan, are further contextualised within the paper's case study of Bhakra-Nangal and others. It comes to the conclusion that the human costs must be prioritised alongside the engineering achievements for any development account to be considered sufficient. Looking at the long-term history of major dams as development tools shows that they have gone from being promising to leaving a more problematic legacy of displacement, inequality, and disputed ideas of progress, rather than the former. While the Bhakra Nangal Dam was important to India's early development goals, it shows that the benefits were not shared fairly and could not be sustained in the long run. For many, including the displaced and marginalised, new crises emerged as a result of the logic that presented dams as answers to food and energy crises. The potential of dams to alleviate the food crisis through increased irrigation and stable agricultural output was, on one level, their selling point. The result was a rise in agricultural economic disparities depending on geography and social status. Uneven patterns of growth resulted from certain areas enjoying agricultural wealth while others were left out. By creating areas of plenty and others of persistent poverty, the dam did not do away with scarcity so much as simply rearranged it.

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Introduction

Attempting to decipher the political and social imagination that propelled mega-water development projects to success and failure is the focus of the following article. I begin by looking at the heated pro- and anti-dam discussions and the main points made by each side, and then I analyse the dams as powerful political symbols and how they relate to the concept of nation (Klingensmith, 2007, p.2). In addition, the major hydraulic works of the twentieth century are seen as monuments of a certain scientific modernism that ridiculed politics and was merciless to those it wronged (Scott, 2006, pp.6-9). The modular “exportable new deal” model in the United States—the Tennessee Valley Authority (TVA)—and its link to the Indian Damodar Valley Corporation (DVC) are used as examples in this article to prove its ideas. Examining the growth and dissemination of grassroots/transnational fights and mobilisations against large dam projects in nations like as China, India, Brazil, etc., we also see dams as arenas for clashes between alternative forms of development (Khagram, 2004). Human history has a profound impact on river flow, management, uses, and abuses, according to the essay’s central premise.

Among the most illuminating moments in the evolution of development theory was the controversy around the mega-dam projects. Despite being touted as an example for national advancement and prosperity, the location of these dam projects exposes the corrupt nature of the promises and sacrifices made to fulfil them. On the site of a mega-dam, the gap between the “high modernist ideology” that James Scott referred to and the reality that everyday people face becomes more apparent than anywhere else. The state’s ambitious plans are heavily based on a tangible framework, and the citizens quickly come to recognise that their own visions of growth and the state’s may be diametrically opposed. An example of this may be seen in the controversy surrounding the Sardar Sarovar Dam on the Narmada River. This issue has ignited a subaltern resistance movement that extends from grassroots organisations and local communities to international advocacy groups such as Survival International and Oxfam. This essay will also examine the Bhakra Nangal Dam Project, a fascinating case study that sheds light on how the government markets mega-dam projects as a non-partisan technological endeavour that will bring about “progress for everyone.” The goal is to keep the public’s attention away from the hidden costs associated with

these projects. This is exacerbated by the fact that there is no national or international political or intellectual framework to challenge these hegemonic narratives of growth. How could the most venerated emblem of post-colonial nationalism fuel the Green Revolution while also causing 50,000 people to face an insurmountable obstacle as a result of resettlement? This article will make an effort to show how post-colonial developmentalism is fundamentally contradictory since it pits the people who promise progress against those who really struggle for it. Along preexisting lines of social inequity and fragility, the benefits are lauded as national advancement while the costs are viewed as a “necessary sacrifice” for the motherland.

There was a strong correlation between the idea that dams could solve several problems at once and their centrality to development. The development of irrigation infrastructure in Bhakra Nangal allowed for the cultivation of more arable land and the adoption of more labour-intensive farming techniques. In the long run, this was crucial for the nation’s food security since it increased food output, particularly in regions like Punjab and Haryana. Dams are multipurpose assets, and the production of hydroelectric power bolstered their position in supporting industrialisation and rural electrification. Dams were promoted as crucial to economic progress, modernisation, and national integration in the policy discourse, which extensively lauded these advantages. The story is complicated, though, when seen through a social lens, which highlights the expenses associated with such endeavours. Large dams have forced local people to relocate, and oftentimes, there aren’t enough programs in place to help them get back on their feet. Many people lost everything in the Bhakra Nangal disaster: their houses, their livelihoods, and their social networks as they were forced from their property. This displacement is a reflection of the uneven distribution of development’s advantages and costs, which fall on certain groups while affecting larger areas. The ethics of growth, equality, and justice are called into question by these basic concerns. Environmental issues and societal costs both make it difficult to assess dams as development projects. Changes to river ecosystems, underwater forests, and long-term problems like sedimentation are examples of the ecological effects of interventions on a vast scale. These effects cast doubt on the idea that technical fixes can magically fix intricate societal and economic issues without creating new kinds of exposure.

Massive dams came to play an important role in development plans in the early decades following independence, when there was a pressing need to find tangible answers to the problems plaguing the very unsteady agricultural economy. Not only was the Bhakra Nangal Dam an impressive technical feat, but it was also a part of a larger

effort to restructure the connection between water, agriculture, and state authority, making it one of the most noteworthy interventions. Its effects are best grasped in light of the food crisis that influenced governmental agendas at the time. Northwestern India's agricultural landscape was transformed as the Bhakra canal system allowed for more extensive irrigation. There is now a more controlled and reliable source of water available to areas that were previously reliant on unpredictable rainfall. This change allowed for a shift toward more intensive farming practices while simultaneously lowering the chances of crop failure. In order to stabilise agricultural production and enable more methodical planning of cropping patterns, the project greatly expanded the amount of irrigated land, as pointed out by Rangachari (2006). Consistent food shortages and price increases made this stabilisation all the more important. It didn't solve the problem of shortage, but it helped build the agricultural foundation that would be crucial to India's quest for food independence.

Simultaneously, the advent of guaranteed irrigation paved the way for agricultural technology advancements. A steady supply of water was crucial to the spread of fertilisers, improved agricultural practices, and high-yielding crop types. This change was made possible by the Bhakra system, which led to a dramatic rise in agricultural output, especially in the states of Haryana and Punjab. Nevertheless, the change was not uniform. Farmers with larger plots of land and more financial resources reaped the most benefits from canal irrigation, inputs, and loans. Irrigation facilitated agricultural expansion, but it also served to highlight and solidify preexisting socioeconomic stratifications in the rural economy. An other important aspect of the project was the production of hydroelectric electricity. Bhakra installations' ability to generate power aided in the growth of industry and, by extension, the economy as a whole. When other energy options were few and expensive, hydropower was considered a valuable resource. Large dams were frequently rationalised in development studies as a means to facilitate industrialisation and infrastructural development through the provision of inexpensive and renewable electricity (Khagram, 2004). Areas connected to the Bhakra system saw the emergence of small and medium-sized companies and metropolitan hubs as a result of electricity. Agricultural transformation was another area where availability power interacted. To augment canal water and further enhance farming, electrification allowed the use of tube wells and other kinds of mechanical irrigation. Cropping intensity and yield were both enhanced by irrigating using both surface and underground water sources. The unequal distribution of advantages was evident once again. Due of the high initial investment necessary, smaller farmers were unable to

take use of electrically driven technology. In addition, electrification in rural areas was inadequate and unequal since power was mostly allocated to urban and industrial users.

Reconfiguring area economies was one of the many benefits of the Bhakra Nangal project, which went beyond only producing electricity and facilitating irrigation. Building canals, roads, and other related infrastructure boosted connection and made it easier to transport commodities and resources. Markets were able to flourish and hitherto unconnected regions were able to join larger economic networks because of this. According to Rangachari (2006), the project will have secondary impacts such as stimulating local economies, especially during construction, and creating more job opportunities. Although the modifications' long-term effects differed among locations and socioeconomic groupings, they did help bring about some economic dynamism. Controlling the flow of the river has implications for flood control as well. Regulated seasonal variation of water levels in some downstream sites to reduce flooding was a project. This helped stabilise agriculture and lessen the impact of unexpected natural shocks. This was obviously a fast-growing reliance on centralised water management systems, but the control was not absolute. Local interactions with water changed as humanity shifted from natural cycles to artificial systems, and the state became more involved in the day-to-day economic life. The Bhakra Nangal project had an impact on administrative and institutional capacities in addition to the aforementioned material consequences. To complete such a mammoth task, coordination was necessary at multiple governmental layers and a special expertise was needed. A more technocratic approach to development, with a focus on massive infrastructure projects, became the norm as a result of this. Post-Independence dams in India, Klingensmith (2007) suggested, were part of a grand scheme of modernisation that involved the government. The Bhakra was not only a project with economic significance, but it was also a project that helped to strengthen the state's capacity.

However, there were many factors other than the dam that could impact the project's outcome. The efficiency of water delivery and canal system maintenance were important to the success of irrigation. The electrification benefits were related to access and costs. Agricultural improvements came about as a result of the combined efforts of credit, input and market support programmes. This was not a one-off solution to development issues, it was a part of a larger set of actions. However, it is obvious on closer analysis that Bhakra Nangal project did handle some of the contemporary problems of the post-Independent era like food production, resource management, etc., but its impact was neither uniform nor problem free. Existing social and economic systems resulted in a

different distribution of benefits derived from it across different groups and regions. The idea of state-led planning of technological solutions and centralised control was also evident in the focus of the development apparatus on large-scale infrastructure. These features make it more difficult to assess dams as a developmental treatment than it otherwise would be. Even in the face of adversity, the Bhakra Nangal Dam was an integral part of the region's infrastructure, helping to provide food, power, and economic growth. But the results are not foolproof, and are not consistent, so the developmental structure has to have some shortcomings. When the focus of attention shifts from short-term benefits to longer term social and environmental effects of these initiatives these contradictions become all the more evident. The impact of the Bhakra Nangal Dam on the status of irrigation, electricity, and the development of the region was a critical factor in shaping the path of development for India after independence; but it was also accompanied by the displacement of people and the restructuring of their societies, which was not insignificant. It was necessary to submerge inhabited landscapes when the river valleys were converted into reservoirs. This involved the displacement of people whose living depended on these. Dammed development involved the restructuring of land and water, permitting agricultural development in some areas and loss in others, so displacement was a key and integral part of this process.

In the construction period of the Bhakra Nangal project, lakhs of people were displaced and in fact, several villages were inundated and a massive population was driven out of their homes. Research indicates that some 30,000 people had to abandon their residences when the reservoir was built. Several of these were subsistence farmers or rural dwellers for whom land and natural resources were a key part of their livelihoods (Rangachari, 2006). The entire relocation process was long and unequal, and uncertainty, delays in compensation and inadequate planning of rehabilitation were common features. From a social standpoint, it is not the displacement itself that is significant, but rather its nature. In these places, land was not merely a product but a medium of cultural and personal continuity, a place of family and social affiliation. Economic dispossession, therefore, was coupled with a disruption of social life as a result of loss of land. Placing families in various locations, often without prior acquaintance, broke apart networks of mutual aid that had long been woven among people living in rural towns. Re-establishing an economic life was often hard for refugees, as the new communities lacked agricultural opportunities and/or irrigation. A new form of marginalisation arose due to the transition from the familiar way of life of a farmer to the unstable economic way of life. Such problems were exacerbated by the poor repair

operations. If they were present, comp plans were typically limited to simplistic economic analyses that failed to reflect the full extent of the harm displaced people had to endure. Not enough money could be used to replace the loss of arable land, community, shared resources such as water and woods. Even the compensation wasn't equally given, for some tenants, sharecroppers and landless labourers were not given while some who had official land titles were favoured. This resulted in partial compensation for some and virtually no compensation for others, and thus in unequal displacement experiences. The trends outlined above are representative of a more systemic issue with large dam development, namely the unequal spread of benefits and risks from dams by geographic and demographic factors. As noted in the preceding section, large dams "accentuate the inequalities in terms of income distribution," so the poorest sections of society are most negatively impacted by dam effects of displacement and disruption. In the case of Bhakra Nangal, the regions which received the power and irrigation facilities (parts of Haryana and Punjab) did not match with the regions where water was flooded and displaced. The physical segregation of development zones of advantage and development zones of sacrifice amplifies the unequal geography of development.

Restructuring of agrarian relations following displacement increased the generation of inequality. When land was limited, people who had lost their land often encountered similar difficulties when they sought to resume farming. Some individuals were forced down the social ladder by the pressure to work for wages or to take up in informal economic activities. Those who were able to keep their irrigated property also reaped the benefits of higher yields and easier access to markets. The division of the social structure was accompanied by the creation of new forms of social stratification and the creation of new hierarchies in the rural society. Relocation resulted in the destruction of cultural/historical landscapes as a social outcome. Long-forgotten villages, their temples, graves and other artifacts of communal memory were covered by water. Such losses are fundamental to comprehending the lived experience of relocation, but they are hard to measure using traditional development indicators. The obvious physical change is not the only one: the symbolic removal of all residues from the past or present is also suggested by the transformation of familiar sites into reservoirs. The Bhakra Nangal case, in which the displaced population expressed their grievances over injustice and resettlement, has been a similar story in the past. The narratives of the Mulshi uprising reveal that farmers viewed the building of the dams as a way of "impoverishing one set of Indians to benefit another," highlighting the distributive injustices that are inherent in dams. If some populations are negatively impacted in

the name of progress or development, this term represents the essence of the dam-led growth conflict. Another factor is the early years of independence's lexicon of dams. The social impacts of such projects were less visible, because their positive nature was symbolised and given moral justification by referring to them as "temples of the new age". The metaphor of the temple may have been fitting for the people who benefited from the development of irrigation, power and the economy. However, for those whose homes and farms were swallowed up by the water, it was a sign of abandonment and loss. Homes turned to places of submersion as the reservoir of plenty became the symbol of need in another place. The duality that this paradigm reveals is a more fundamental issue. A technological development model emphasizes the efficient use of technology and the benefits to the whole sector, rather than equity and fairness concerns, which is evident in the support for large-scale, centralized interventions. The decision-making process was often at higher administrative levels and the communities that would have been most adversely affected by the dam's construction were seldom involved. This lack of participatory decision-making led to the normalisation of relocation as an acceptable cost of development, and to the marginalisation of local voices.

But displacement and inequality were not coincidental; they were one of the rationales behind these enterprises. The tremendous amount of work required to construct the dams required the redistribution of land and resources. This was particularly the case in regions where social inequality was already in place, worsening life for those people. The story of Bhakra Nangal thus became emblematic of a trend of exclusion and/or inclusion as part of progress, often at the same time. A complicated interaction between material advantages and social costs is therefore shown by the dam's impact on landscapes and livelihoods. Although the project helped with some national concerns, such food production and resource management, it also caused some displacement and inequality, thus it can't be called a complete success. The inequalities and conflicts resulting from development are not just expounded on by those who are not directly affected by it, but those who are aware of them.

Positioning Bhakra as a National Imperative

More than the sum of its components, the Bhakra Nangal mega-dam project represented postcolonial India's aspirations. Pt. Jawaharlal Nehru said it best when he said that dams are the "temples of modern India," expressing the patriotic intent of the undertaking. In post-colonial India, the Bhakra Nangal Project served as both a national necessity and a technocratic model for development. The emotional effect of the people's piercing

anguish over separation and strong nationalist feelings provide dimension to all of this. In order to compete on the global stage, India has to develop into a strong, modern nation. During this precarious time, many pleaded for the Nehruvian state to progress for the benefit of the nation and its citizens. Such a project was Bhakra, an idea that had been floating about since before independence but was driven by the determination of a nation just emerging from its nationalist war and ready to make its mark on the world. Bhakra was not only a significant ceremonial event, but also crucial to the continued existence of the agricultural industry in the Punjab, which remained a part of India during Partition. Prior to India's independence, the government gave the western part of Punjab the attention it deserved, but the southern and eastern parts of the province were neglected. The magnitude of this lopsided growth was evident when India received these portions after Partition. Indian farmers lost access to their previously irrigated canals when the Indus basin was divided (Haines, 2021). The envoy from East Punjab was able to get the other states' chief engineers to agree that the refugee situation would provide East Punjab exceptional water rights during a conference in December 1948 (Haines, 2021).

This project was unaffected by any problems because of the region's requirement for irrigation infrastructure. Without a shadow of a doubt, the initiative was the right choice since it served the national interest and solved the real-world issues surrounding refugee settlement in Punjab. In contrast to the project's portrayed image, Khagram describes it as the "large scale, top-down, and technocratic pursuit of economic growth through the intensive exploitation of natural resources." This trend had nearly become hegemonic among postcolonial states and their international backers by the mid-twentieth century, when dams were signs of technical progress and food security, a sign that a state had triumphed over the underdevelopment and shadows of colonialism. According to Khagram, the interests of the powerful coalition of proprietary classes in India were served by this dam-building project (2004). Daniel Haines acknowledges that there were cultural, in addition to political and national, factors in the project's promotion (2021). The construction of dams was portrayed in both popular Hindi cinema and state-produced public information films and brochures as a monumental leap in technological innovation, a source of national pride, and an iconic symbol in the Indian psyche. The story was skilfully upheld by carefully orchestrated marketing and public remarks delivered by the country's prime minister. It is worth mentioning, nevertheless, that Haines makes a valid point about how the removal of elected local authorities in Bilaspur and the dam site itself contributed to the subordination of

democracy to development aims (2021). “When such wishes come into conflict with the larger interests of the country, the latter must prevail” (Haines, 2021), which is why the GOI merged Bilaspur and Himachal Pradesh without consulting the people of Bilaspur. Under the guise of the “greater good” for the nation and the Punjabi people, patriotic language and clever political decisions were used to advance the Bhakra Nangal Dam project, with a focus on Bilaspur. A persistent strategy would have centred on the idea that the project was morally imperative and would improve people’s lives in the region and nation.

Economic Benefits of the Dam

Researching the global debate around dams is strongly advised. A large portion of the population views dams favourably. Among its many purported benefits are the following: the provision of potable water for households and companies, the improvement of navigation and regional development, the generation of hydroelectric power, the mitigation of flood and drought risks, and the efficiency of irrigation. Dissidents, on the other hand, argue that dams cause more harm than good, both to society and the environment. Really, what they do is make economic inequality worse in society. According to Amit K. Biswas, the World Commission on Dams Report (Nov. 2000) deepened the divide that had formed during the 2000 Second World Water Forum in The Hague between proponents and opponents of dams since neither side did their homework. India firmly rejected all 26 recommendations made by WCD, describing them as “not acceptable” and “wholly incompatible with India’s development imperatives.” Although there may be a general rule that applies to dams worldwide, Biswas argues that no universal solution will be suitable for all nations. Further, the book states that dams have been condemned for the large social and environmental costs they impose, but that the lack of sufficient data regarding the actual operations of these projects makes it impossible to ascertain the validity of this “allegation.”

So that we can assess the Bhakra Nangal initiative, let’s start with the basics. The whole total of 245.28 crores is what this dam project is worth. The lowest point of the concrete straight gravity dam is 167.64 meters (740 feet) above ground level, while the highest point is 225.55 meters (550 feet) above river bed. Both the gross and live storage capacities of Gobind Sagar Reservoir are 9,340 MCM and 6,911 MCM, respectively. The Bhakra Nangal Dam, which received this amount of funding, improved six separate areas: irrigation, hydroelectric power, flood moderation, food production, hunger avoidance, and regional economic growth, among other subsidiary and incidental

effects. The project's principal aim and most significant accomplishment was the development of irrigation infrastructure. Large swaths of semi-arid and dry land were previously unable to get potable water, but that all changed when the Gobind Sagar Reservoir was built. A vast network of canals was constructed in Punjab, Haryana, and Rajasthan, extending over an area of about 28.8 lakh hectares. Additionally, irrigation was enhanced across an additional 9 lakh hectares of land that had previously been watered by less dependable systems. By 1963–1964, the total irrigated area of the project had increased to 2.48 million acres. People in the Hisar, Sirsa, and Fatehabad districts of Haryana commonly call the water from the Bhakra canal “the Maru Ganga,” meaning “the Ganga of the desert.” This is where the most noticeable change occurred. The dam made it possible to increase farming intensity from one to two harvests per year in the existing Sirhind canal regions of Punjab, where river flows were previously unpredictable, by creating a secure perpetual supply (Rangachari, 2006). By increasing the water table, which allowed for tube well irrigation to aid canal water, the irrigation system greatly increased the region's agricultural capacity and, in turn, groundwater recharge. Despite not intending to generate hydroelectric power, the project report spanning the years 1939–1942 ultimately opted on the configurations of two powerhouses on the Nangal hydel Channel at Ganguwal and Kotla and one powerhouse at Bhakra Dam. After all the modifications were finished, the project was given a grand installed capacity of 1,480.30 MW. The project had produced 211 billion kWh from commissioning in 1999–2000. Because the Northern Regional grid was chronically low on peaking power, Bhakra provided stability—and a clean energy source—that the region had previously lacked. Additionally, the initiative pushed for widespread electricity in rural regions, which facilitated modernisation of homes, small-scale industries, and tube well irrigation.

Intelligent management of conservation storage resulted in flood mitigation, which was included as an accidental benefit in the project report. Throughout its known history, Sutlej has moderated and caused repeated floods seventeen times between 1967 and 1995. On fifteen of these occasions, the output was maintained below 100,000 cusec (Rangachari, 2006). Without notice, Bhakra was completely submerged by the August 2000 flash flood that had the potential to wreak immense destruction on the plains downstream. Among the most lauded results of the initiative that aided in the agricultural revolution in India are food production, famine prevention, and the Green Revolution. The Green Revolution era saw a steady outperformance of the all-India average in yields per hectare in Punjab and Haryana, as shown by Rangachari in his book (2005). This was most evident in the 1965–66 crop year, when Punjab's wheat

and rice output surged. Due to their prominence in the Public Distribution System, the states of Punjab and Haryana deserve recognition for their position as the centers of centrally produced food grains. According to Rangachari (2006), eleven of the most prolific wheat-growing districts in India in the early 1990s were located in the Bhakra command area: Sangrur, Ferozpur, Faridkot, Amritsar, Patiala, Ludhiana, Bhatinda, Jalandhar, Hisar, and Ganganagar. The region's ability to withstand food shortages was enhanced by the irrigation system. Despite the terrible drought that struck in 2002, the Bhakra command area was able to keep its agricultural stability, in contrast to the pre-Bhakra command territory that was afflicted by terrible famines.

The command area's drinking water supply, industrial development (including Ludhiana, the world's largest bicycle manufacturer, and numerous small-scale industrial units), poverty reduction, women's welfare (thanks to the canal water in the villages), Indians' capacity building and skill enhancement, and the rehabilitation of 6 million refugees from the partition were among the incidental and ancillary benefits. Dharmadhikary et al. conducted a zone analysis of the command area, which provided one of the most thorough evaluations of the Bhakra Nangal Project's results. During the design stage, the command area was divided into three zones: Zone I, which consisted of areas with high rainfall and ongoing irrigation that were given "perennial restricted" irrigation; Zone II, which included areas bordering the Sutlej and had inundation irrigation before being switched to canal irrigation due to the dam; and Zone III, which included really dry, arid tracts where Bhakra offered a whole new irrigation capability. To determine the true effect of the initiative, this state-by-state zonal distribution was crucial. Zone I made up 57% of Punjab's total command area, while Zone II added another 29%. This indicates that 86 percent of the Punjabi portion of the Bhakra command area was either now irrigated or was being irrigated to replace the inundation flows that were reduced downstream by the dam. Zone III encompassed 15 percent of Punjab's Bhakra command area, 86 percent of Haryana's command, and 100 percent of Rajasthan's command.

This is a crucial point to grasp because it has far-reaching consequences; according to Dharmadhikary et al., Punjab reaped very few benefits from the project, while Haryana (particularly Hissar, Sirsa, and Fatehabad, which together make up 75% of Haryana's Bhakra-irrigated area) and Rajasthan reaped the greatest rewards. Punjab=Bhakra=Green Revolution is a set equation in the general psyche, yet this is not the case. It would be a "gross exaggeration" to classify all of Haryana and Punjab as largely semi-arid regions with unclear irrigation before to the Bhakra project, claims

Dharmadhikary et al. Despite losing its most irrigated lands to Pakistan, Punjab still had the greatest share of irrigated planted area in the country in 1949–50, at 35.3% (Dharmadhikary et al., 2005). Another point made by Dharmadhikary et al. is that the Green Revolution couldn't have happened without groundwater, not canal water. After 1965–66, the areas irrigated by tubewells in Punjab and Haryana grew at a far faster rate than the areas watered by canals in the states. According to farmers, the canal waters they receive are relatively restricted and happen at inopportune times for their crops. The village of Mahas in the district of Patiala, Punjab uses 90% tubewells for irrigation and just 10% canals, despite the fact that the groundwater there is salty. Furthermore, according to Dharmadhikary et al., farmers have long griped about the fact that canal deliveries have been falling short of their needs. In contrast, paddy and other crops grown intensively in Punjab and Haryana need an excessive amount of water. The need is met by tapping into groundwater sources; data shows that half a million tubewells were operational in Punjab by 1977–78. While in Haryana this accounts for half of the net irrigated area, the researchers have found that in this case it accounts for just approximately a quarter. So, they say it's not only wrong to blame Bhakra for the Green Revolution's success and ignore groundwater's part; it also gives the impression that the dam is sustainable, which it isn't. During the crises of the 1990s and 2000s, it became evident that farmers were utilising submersible pumps and 20 HP motors to rapidly deplete groundwater, the very resource that had powered the Green Revolution.

Additionally, Dharmadhikary et al. refute the prevalent narrative that portrays India as a food importer and a beggar, arguing that the mega-dam projects alleviated this plight by boosting food output nationwide. Food self-sufficiency = Punjab and Haryana = Bhakra is the most popular equation they use in public perception. The only way for India to solve its food shortage, according to this, is to build massive dams. As a rebuttal, they say that the food production component of the project was given little attention throughout its construction, and that the Bhakra Project did not include precise projections of the potential gains in agricultural output. One valid criticism is that the Bhakra-Nangal Dam began to irrigate water in 1953–1954, long after the US Agricultural Trade Development and Assistance Act (PL 480) had been passed in 1954. The import of PL 480 began in 1956–57 and lasted for another fifteen years, all the way until 1972, in India.

It is instructive that, despite the project's boasts of freeing India from food dependence, food grain imports and deficits remained elevated during its 18 years of existence. Here it is worth noting that imports are just one indicator of food insecurity

or self-sufficiency. One such metric is food costs. Both of these, however, mostly apply to those who get their food from stores. It is not possible to achieve self-sufficiency only because there are no imports (Dharmadhikary et al., 2005). A decade after the Bhakra canals opened, in 1966 and 1968, a package of HYV seeds, chemical fertilisers, and groundwater extraction was introduced. Some claim that this was the catalyst for the true breakthrough in food production. Even while the Green Revolution couldn't have happened without the Bhakra-Nangal project's irrigation infrastructure, that infrastructure couldn't have brought about food self-sufficiency on its own.

Ecological Costs Paid by the Region

Dharmadhikary et al. make a compelling case that the Green Revolution model's success led to a systemic problem in Punjab and Haryana's agriculture. The Johl Committee, which was established by the Punjab government, came at this conclusion. There are other interconnected aspects to the situation, but the most pressing is the decline in water table levels, as this is a non-renewable resource that is being depleted at an alarming rate, making it impossible to replenish the irrigation systems in Punjab and Haryana. The Johl Committee expressed concern over the soil degradation caused by chemical fertilisers and intensive monoculture, stating that the soils in Punjab and Haryana have transformed into a "laboratory culture" that needs increasing amounts of these fertilisers, micronutrients, pesticides, and insecticides to yield the same amount of wheat and rice (Dharmadhikary et al., 2005). In areas where drainage was insufficient, the ecological toll of canal irrigation became evident through waterlogging and salinisation. The region becomes more susceptible to floods, which has disastrous effects on trees, roads, buildings, and infrastructure in addition to crops. According to Rangachari, the problems of waterlogging and salinisation are being handled and are often exaggerated; however, Dharmadhikary et al. respectfully disagree. The condition is characterised as worrying, according to Shri Vinay Kumar, Vice Chancellor of CCS Agricultural University, Hisar. A potential impact of up to 70% was seen on approximately 14% of the total irrigated area. Having said that, the facts and statistics that were accessible were vague. Their accounts come from places like Badopal in Dist. Fatehabad, Haryana, where the problem first appeared in 1978 and per the local patwari, the water would just stand in the fields. As a result, approximately 75% of the land had been negatively impacted by waterlogging, and 25% of the population was financially affected.

The result was a dramatic increase in farmer suicides and indebtedness in the areas that were portrayed as India's breadbasket by the late 1990s. "Economically disastrous,

socially untenable and politically unsustainable” were the words used by the Johl Committee to describe this potential systemic catastrophe. The ecological dangers were known about in the 1970s, thus this was not unexpected. Due to minimum support prices, subsidised power for tube wells, and price supports, crop diversification became economically illogical, allowing the wheat-rice system to persist. According to Dharmadhikary et al., it is important to recognise that the dam laid the groundwork for this system, which in turn caused the catastrophe. It is well-documented that the Bhakra Reservoir lost a total capacity of 15.02% between 1958 and 2000 as a result of silt deposition amounting to 1,482.24 MCM. This is a significant issue that has to be addressed. Siltation has happened in both active and dead storage, which goes against the initial predictions and might have undetermined long-term effects for the project. Another issue that is unmentioned in official reports is the hydrological alteration of Zone II downstream, which occurred when the inundation irrigation system that relied on the Satluj’s natural floods to feed farmland without investing in infrastructure was removed. Even if those Zone II lands kept receiving irrigation, the old system could have been maintained without the need for cash, chemicals, or worries about waterlogging. As a modification whose long-term ecological implications have not been evaluated, its replacement by canal irrigation—which Rangachari’s zone analysis labels as a “benefit”—is a more fair description.

The massive reservoirs built as part of the project have had an effect on aquatic ecosystems as well as terrestrial ones, causing floods that has wiped out once-rich biodiversity hotspots. Even though there is a lack of thorough study comparing the condition before and after the effort, Dharmadhikary et al. were able to resolve main problems. Importantly, thousands of people had to be relocated because of the project (more on that later) and some 178.75 sq. km. of bought land was significantly submerged. According to Dharmadhikary et al. (2005), 5,750 hectares (ha) of the whole area was submerged forest land. And in an attempt to usher in the Blue Revolution, the encouragement of foreign fish species has led to the extinction of Mahseer, a traditional fish species of the Sutlej ecosystem. The research shows that 32 species of fish are near threatened, 20 species are vulnerable, 12 species are endangered, and 2 species are severely endangered due to this irreversible ecological degradation (Dharmadhikary et al., 2005). Along with this, the construction of the dam turned fishing become a lucrative industry. Although there is no evidence available previous to the completion of the dam that proves it, the Bhakra Beas Management Board (BBMB) has highlighted pisciculture as an environmental advantage of the project. The researchers really recorded: The

reservoir/submergence area now has a very different species composition, with less desirable fish accounting for most of the production. The Mahseer is almost completely missing, according to the Punjab Biodiversity SAP. Sukhdev Sharma, who has been with Govind Sagar's Fisheries Federation since 1977, informed us of the same thing while we were in Bilaspur. Mahseer, Gidd, and Mir Carp were the most sought-after species before the reservoir, he claimed. According to Dharmadhikary et al. (2005), the mahseer saw a significant decrease and is now very rare since the reservoir was built (p. 195). According to Dharmadhikary et al. (2005), the presence of a large reservoir has altered the local microclimate, which in turn has several negative effects on human health. For example, there has been an uptick in malaria cases, more fog in the area around the water, which has led to an uptick in respiratory illnesses and accidents, and an increase in cases of gastroenteritis, enteric fever, and viral hepatitis as a result of a lack of drinkable water.

Accounting for the Evaded Social Costs

The Bhakra-Nangal project was pushed as a national undertaking, and the locals were urged to part with their land in the spirit of nationalism and for the better good of both the region and the country. Despite the project's moral and positive marketing, it ended in displacing thousands of people and leaving them without a means of rehabilitation. Irrigation and electricity ministries controlled the domestic atmosphere at the time, and there was no welcoming institutional framework that addressed the complaints of the project's oustees. The domestic environment only started to take the needs and plight of displaced people seriously in the 1970s, when transnational ties between environmental movements in India and international organisations began to take shape. An important landmark was the establishment of India's National Committee on Environmental Planning and Coordination at the 1972 United Nations Stockholm Conference. Following this, the establishment of a federal Department of Environment in 1980 provided a bureaucratic counterweight to the dam policymakers who had previously held influence, and critics gained institutional support with Prime Minister Indira Gandhi's 1977 order mandating EIAs for all large-scale irrigation projects (Khagram, 2004). Thus, the Bhakra-Nangal Project's story about displaced people would be very different from the Sardar Sarovar Dam's and the Narmada bhachao Andolan's narratives, which are both substantially supported. Here we will take Bilaspur as an example and look at this in depth.

Bilaspur was established in 1663 as a princely state; it was formerly known as Kahlur. Many different faiths and cultures coexisted in what is now known as Old

Bilaspur Town (OBT), but that all changed while the Bhakra-Nangal Dam was being built. The area was home to prosperous landowners and a thriving economy based on the trades of pottery and blacksmithing practiced by the landless. A major figure in the promotion of Bilaspuran art and culture was the Raja of Bilaspur. Nevertheless, over 31,191 acres of land had to be acquired for the Bhakra-Nangal Dam project. Of this total, 10,676 acres were privately owned, while the rest belonged to the government. A total of 376 communities, 10,000 acres of farmland, and 20,000 acres of woodland were all buried when the dam was built. How much land was inundated was the determining factor in the compensation. All transactions were settled in cash up to a height of 1,280 feet. Between 1,280 and 1,700 feet, one may be eligible to acquire money or property. Those who preferred monetary compensation stayed in Himachal Pradesh, while those who preferred land were allocated parcels in Hisar district, over 200 miles away from their ancestral homeland. The districts of Sirsa, Hisar, and Fatehabad in Haryana were among the most impacted, with around 11,777 households receiving rehabilitation. Other districts in Himachal Pradesh, including Bilaspur, Nalagrah, and Una, as well as Ropar in Punjab, also had afflicted families. According to Mishra (2019, pp. 7-8).

By imposing its will on the region, the federal government treated the locals like subjects and quelled any opposition that would have slowed down the dam project. The general populace had little idea what land was worth, so they took the government's compensation at face value. Mishra discovered that compensation amounts varied from 250 per acre for uncultivable property to 1,000 per acre for agricultural land after filing an RTI. The landless, in contrast, were paid a total of just 200. The area under OBT does not have any records of compensation rates per unit area since there is a lack of documentation. According to Mishra, the healing measures that were agreed upon by the king of the old Bilaspur princely state and the Punjabi government on July 7, 1948, have never been implemented. As Mishra so eloquently describes, most of the town's houses were joint families registered in the name of the male head, therefore each family was allocated a piece of land between 800 and 1800 sq. ft. during rehabilitation from OBT to NBT, regardless of the size of their family. A number of states, including Punjab, Haryana, and Rajasthan, are benefited by the dam, he continues, but the people who lost their homes and land do not have enough space to live and raise children. Even more precarious is the fact that the government has done nothing to alleviate their plight or offer them opportunity to earn a living. Mishra (2019, p. 12) describes the new Bilaspur town (NBT) as a "unplanned and haphazardly developed town" due to the fact that it has grown from its original 929 family residents to 3,226. After giving up their

houses for the nation's growth, the oustees experience a deep feeling of being neglected and betrayed by the nation.

In addition to bringing attention to the difficulties encountered during restoration, Mishra notes that the settlers of Hisar, who were 200 kilometres far from their ancestral homeland, were extremely vulnerable. Their request to be resettled in Fatehabad district was denied, forcing these family to settle for Hisar, which had low-quality land. The evicted people toiled on the forested property for a very long time and are still fighting a losing battle to get their lives back on track. The original villagers' interests clashed with their own, and they were forcibly evicted from their plots. The local authority then falsely accused the evicted individuals. Locals have harassed the oustees by insultingly dubbing them "bilaspuriyas," and they have been politically unable to do anything about the tremendous marginalisation and abuse they have endured. A huge and irreparable loss of social and cultural capital for the oustees, compounded by psychological anguish from being separated from their original country, kin, and culture, occurs with social trauma and marginalisation. In light of the government's claims, it is critical to determine who benefited and who lost out on the Bhakra-nangal Dam project; in this case, the displaced people do not qualify. As Mishra puts it, the inhabitants' "standard of living much worse than before the displacement" and the "basic civic amenities and livelihood severely endan-gered" (Mishra, 2019, p. 14) are the results of the Bhakra Dam's "pathetic" impact. For his study, he used a SANDRP (South Asia Network on Dams, Rivers and People) publication. Because they depend on the same two springs that supply water to Bilaspur town, 350 villages along the Gobind Sagar riverbed are critically short in potable water, as shown in the report. There is a severe lack of water in the area, especially in the summer, because the springs and lake have dried up.

The focus of most resettlement projects has been on physically relocating impacted and displaced people rather than on their economic and social development. As a result, the rehabilitation and resettlement programs are no longer as effective, and the resettlers face a higher risk of poverty (Mishra, 2019, p. 15). Despite the dam's exceptional performance for years, it is profoundly upsetting that the Bhakra people, who were evacuated in 1970, were not provided with power and were even made to pay for it. Because there were no roads in the villages, BBMB said, there were also no power poles to link the houses. They also claimed that this energy source constituted a "unfair burden" on the project. Here is simply a brief outline of the essential promises that were never honoured, despite the fact that the oustees handed up their homes, customs, land, and roots to make place for the Bhakra-Nangal Dam Project. According to Raina et al.,

who classify these individuals as “victims of development,” forced displacement is one of several types of dispossession, including the loss of land and agricultural practice. As a result, people’s respect and dignity are eroded, and a “snapping of cultural, ethical and philosophical roots” occurs. Similar to what the Bilaspur oustees are going through, a poem written by a Thai girl named Yaowarak Srikampha goes something like this: “Don’t the Minority have a heart? They are trying to get us to agree to their plan by saying that we should give up our freedom for the greater good of the nation. The minority, nevertheless, surely has some compassion. They adore their hometown, don’t you think? In a 1997 study, Raina et al. Even though science and technology have come a long way in the 21st century, there is still no definitive answer as to the true costs and advantages of massive water development projects, and dams continue to be contentious topics. Opponents of large dam projects highlight the devastating effects that dams have on society, local cultures, and the environment, while supporters of these projects claim that the benefits of dams, such as increased water availability for irrigation and drinking, reduced vulnerability to floods and droughts, improved power generation and navigation, and overall regional development, more than justify the costs. Since these programs mostly benefit the wealthy, they claim that they worsen economic inequality (Biswas, 2006). Large dams are erected not for their purported advantages but because the wealthy are willing to part with large sums of money, according to Roy (2006). A disproportionate number of impoverished and marginalised people are uprooted by these projects and see their woods and land inundated. As an example, in India, 60% of the displaced people are Dalits and Adivasis, as a result of dam construction (Biswas, 2006). Their “ethnic otherness” facilitates the marginalisation of their issues and the devastation of their cultural practices and artefacts. Their deaths are considered a temporary setback in a democratic society (Roy, 2006, p.59-60).

Additionally, large dam projects have far-reaching consequences for the ecosystem. Many plant and animal species lose their habitats as a result of deforestation, and changes in hydrology have an impact on biodiversity and species populations (for example, by blocking fish migration pathways). Dams generate artificial lakes, which may be a haven for mosquitoes and other diseases like dengue and malaria. The tropical forests and vegetation submerged under dam reservoirs emit methane and carbon dioxide as they rot and decay in slack waters, often surpassing emissions from thermal power plants, despite hydropower projects’ claims of being clean energy sources (Klingensmith, 2007, pp.10-19). The World Commission on Dams states that underperformance is a significant concern when building major dams. In addition to the problem of silt sedimentation at

reservoir bottoms, which reduces the dams' lifespan, large dams usually don't generate enough water or power. According to Klingensmith (2007), these meticulous details can lead to significant cost overruns. Actually, the logics behind TVA and DVC, two examples of multi-purpose river projects, are fundamentally contradictory. It is vital to juggle many interests. An excellent illustration of this is the constant requirement to release water from reservoirs for agricultural use and flood control, despite the fact that high reservoir levels are required for hydropower generation and transportation (Klingensmith, 2007, p.10-19). In 2000, the World Commission on Dams (WCD) conducted a study that concluded the costs of the massive dams constructed in the 1900s were "avoidable and un-necessary." These and other drawbacks were considered before arriving at this result. According to Biswas (2006), the debate over big dam projects is today characterised by extreme dogmatism and lack of progress. On both sides of mega dam debates, you'll often see representatives from groups with a vested interest in the outcome. In reality, he contends that ex-post facto assessments, which take place after a certain amount of time has passed since a huge dam has been operational, are the only appropriate method for weighing the pros and cons of such projects. Also, there isn't a "one size fits all" answer to the issue of supplying enough water and electricity to everyone.

The TVA and DVC

The Tennessee Valley Authority (TVA) emerged from Franklin Roosevelt's "Hundred Days" in 1933 and served as a multi-functional entity that oversaw land reclamation, power generating, and flood control in the American South. Its apparent success led many to believe it might serve as a mobile New Deal, a paradigm for global reconstruction based on modules, that could help economically struggling and technologically backward areas. As one of the first major development laws passed by an independent India, the Damodar Valley Corporation (DVC) came into being in 1948. The advertising campaign dubbed it a "TVA on the Damodar" and acknowledged its major inspiration from the model. Inspired by the Tennessee model, many Indian planners and scientists, like Meghnad Saha, believed that the "modernity which had evolved painfully in the West could be reproduced in a matter of decades in the decolonising world" (Klingensmith, 2007, pp.37-40).

An ideology of technocratic, apolitical management, according to which a global economic boom might be achieved by the expert-led reorganisation of nature, negating the necessity for a social revolution, was the driving force behind these undertakings. But both organisations failed miserably over the years compared to its early promises;

the DVC is generally considered a letdown by modern observers, while the TVA devolved into a power company with an exceptionally bad track record when it came to environmental protection and a mountain of debt. Constant interference by political factions and animosity between regional state administrations hampered the DVC's execution, which ultimately resulted in the completion of just four of the eight dams originally intended. While David Lilienthal lauded the TVA as a modular success in his bestseller *TVA: Democracy on the March*, the truth is that it was more of a "simulacrum"—an idealised representation of an apolitical technocracy that was never really in existence. (Klingensmith, 2007, pp.3-10).

Nation, Modernity and Mobilizations

The 20th-century dam rush was symbolic of the modern nation state's obsession with social engineering, the idea that society exists independently of the state and political sphere and can be controlled and changed for the better (Scott, 2006, pp.6-7). The Enlightenment's ideals of individual progress and a flawless universe provided the foundation for this view. Aside from producing hydropower, the TVA and DVC were ambitious undertakings with grand ambitions to improve the lives of millions of people and set new standards for regional planning and development under the auspices of a public authority and a technical intelligentsia. The Trans-Ohio Valley Authority (TVA) was an all-encompassing development project that sought to construct dams as well as schools and hospitals, preserve topsoil, and educate people in modern agriculture, personal cleanliness, and sanitation, among other things. Its goal was to revive a stagnant, post-Depression society and make it more progressive (Scott, 2006, p.23). "Raising people to real citizenship" was a goal of President Roosevelt's (Scott, 2004, p.21). Arthur C. Morgan, the first chairwoman of TVA, even proposed an overly prescriptive code of ethics for TVA personnel, one that forbade vices like gambling and sloppy sexual behaviour (Scott, 2006, p.24). His successor, David Lilienthal, viewed TVA and similar river valley projects as means to further what he termed "grassroots democracy." In reality, what he meant was a form of participatory autocracy—a tight relationship and interchange between locals and professionals (Scott, 2006, p.26). A "new India in the making" was another intended emblem of the DVC. Historically referred to be the "sorrow of Bengal," the goal was to turn the river basin into a place of optimism and promise. The Nehruvian state's power plant and irrigation system were meant to serve the "ruhr valley of India," a place known for its coal towns and heavy industries, and serve as its foundry (Klingensmith, 2007, p.7).

It is possible to emphasise two outcomes of the high-modernist reasoning that supported programs like TVA and DVC. First, politics is inevitably devalued or banished as a result. Expert solutions that are objectively constructed are believed to be obstructed by political ideals and interests (Scott, 2006, p.7). The modernist development rhetoric largely ignores politics in favour of focusing on technical competence and corruption when discussing development, ignoring the more fundamental concerns of definition and intended beneficiaries. Since the social relationships that result from this approach to governance invariably involve the exercise of power by a small number of social actors (such as the Developmental State, private corporations, international development agencies, etc.) over the poor and underdeveloped, it is deeply anti-democratic (Klingensmith, 2004). Take the case of the TVA. Local power holders, such as the influential lobbying organization of wealthy farmers known as the American Farm Bureau Association (AFBA), had already taken over the agency within a decade of its inception. The resulting soil conservation payments and monopolisation of fertiliser supply by large farmers had far-reaching effects for TVA's goal of social change in rural areas (Scott, 2006, p.29). The prime minister's office, the irrigation and power ministry, and the state governments of Bihar, Bengal, and Jharkhand are all involved in the DVC, where there is a lot of clandestine political wrangling (Klingensmith, 2007, pp.39-40).

Second, the victims of high modernist logic's interventions are treated with complete indifference and brutality. With a focus on the future, everything that has come before—customs and traditions, any social and economic system that has been historically and spontaneously established by the people, and even people's lives—are seen as necessary sacrifices for the sake of nationalistic progress (Roy, 2006, p.60). The TVA's David Morgan warned that "inconveniences and relocations" were possible, but urged people to be understanding and patient while a monumental undertaking took form (Scott, 2006). Between 1952 and 1959, 1.5 lakh persons were displaced as a result of the DVC projects, according to government estimates; their rehabilitation and locations are mostly unknown (Klingensmith, 2007, p.40). Much has been written on the "strange neglect" of the dam refugees by the Developmental state (Klingensmith, 2007, p.1). Officially, the Indian government does not know how many people have been displaced from their homes as a result of hydropower projects since the nation gained its independence (Roy, 2006). Worldwide, the number of people displaced by dams is estimated to be between 40 million and 80 million, with a margin of error equal to Canada's population. Given that dams are products of utilitarian public policy that relies on thorough quantitative analysis of costs and benefits, the absence

of accurate and dependable displacement numbers comes as a surprise. Dams are more than just functional infrastructure; they are also powerful political symbols, according to Klingensmith (2007), which is why they are often shielded from public scrutiny and responsibility. (pages 2-3) They represent the contemporary state, national empowerment, the conquest of nature, and development. Their critical evaluation is diverted by its symbolic force. Paradoxically, the liberal internationalism inherent in the transnational flow of information, skill, and ideology was reconciled with the nationalism imprinted on it in the framework of DVC (Klingensmith, 2007, pp.2-3).

According to Scott (2006), the goals of high-modernist initiatives do not align with what is commonly understood as modernity. This is a significant conundrum. Efficiently managing an eco-social area is like directing a tornado. Things are always changing in today's society, and top-down attempts to control and regulate people's lives almost never work. Even though they are both still in operation today, TVA and the DVC are essentially (thermal) electricity generation companies. On top of that, individuals will fight these kinds of initiatives, and the reasons why are complicated and case-specific. Freedom of speech and assembly, press freedom, elections, an independent judiciary, etc. are all examples of representative institutions that Scott (2006) stresses the importance of (p.17). Adapting modernist plans to local opinion is essential in a democratic context. The efficacy of international campaigns against mega-dam projects is conditional on domestic and grassroots social mobilisation, as well as the level of societal democratisation, says Khagram (2004). This explains why transnational campaigns in India, like the Narmada Bachao Andolan, have been more successful than in other developing nations like China, Indonesia, Lesotho, South Africa, etc., where democratisation is low and grassroots mobilisation is poor. page 20

Khagram (2004) The construction of big dams slowed in the 1990s and 2000s for a number of reasons. Factors such as the 1973 and 1979 oil crises, the global recession of the 1980s, the growing debt of numerous developing nations, donor fatigue among international lenders, and a shift in strategy toward privatisation reduced the amount of public and international funds that could be allocated to these projects (p.9). However, this list does not end with just economic and technical factors. The ever-changing global political economy of growth made large dams an impractical proposition from the start. The emergence of several non-governmental organisations (NGOs), grassroots groups, and social movements led to a shift in thinking about development, which in turn led to the institutionalisation of standards for gender justice, human rights, and the environment. Even before India's independence, there were protests against mega-

dam projects. According to Vora (2009), large-scale protests like the NBA may trace their roots back to the anti-dam struggle of the local people in Maharashtra in 1921 and 1922, known as Mulshi Satyagraha. The movement opposed the Tatas' proposed dam construction using Satyagraha, the first step in a peaceful resistance to imperialism and economic expansion. The memories of the Mulshi satyagraha inspired major anti-dam efforts in the 1970s and 1990s, including as the Silent Valley in Kerala, Tehri in Uttarakhand, and NBA in Gujarat, Maharashtra, and Madhya Pradesh. sections 1–8

Baviskar (2019) offers an analysis of how the story of anti-dam politics in modern India has evolved. The ecologically sustainable and socially just model of development that the anti-dam social movements fought for in the 1990s is now being fought in courtrooms (e.g., cases with the National Green tribunals) and emerging environmental bureaucracies, as opposed to the grassroots struggles that were common in the 1990s. Additionally, these shifts have taken place with growing cultural nationalism and economic liberalisation, which has limited the room for a dramatic shift in the dominant conceptions of progress.

Pandit Jawaharlal Nehru, India's first prime minister, used the phrase "temples of modern India" to describe dams in his 1963 inauguration speech at Bhakhra Nangal. The idea that "big dams as undemocratic" has been advanced by Arundhati Roy and others (Roy, 1999). These divergent opinions and accounts of massive dams in India serve as the basis for arguments between those who support and those who oppose the development of dams. Although dam building and lobbying had started in the 1940s, it reached its height from the 1950s through the 1970s.

Many emerging and least developed nations were enticed by the promise of "what development looks like" and the perception that wealthier nations were racing to build massive dams. But when these initiatives began to launch, they roused the populace or the common people; with modernity for the countries came a wave of homelessness for the impoverished. People all around the world who were impacted by these massive construction projects for the sake of nature expressed their anger through demonstrations since they were forced to abandon their communities, their means of subsistence, the environment, and their poverty as a result of these initiatives. From the 1970s through the 1980s, there was a steady increase in these types of demonstrations and opposition, prompting authorities to either put a stop to these projects or figure out how to help the people who had been displaced.

Now let's look at the Orissan Hirakud Dam as an example. A man-made structure that spans the Mahanadi Delta and is surrounded by embankments and canals. The

British seized Orissa from the Marathas, marking the beginning of its history under colonial administration. They were especially captivated by the water question. Because agriculture was the backbone of colonial India's economy, floods were considered as its worst enemy. The approach that was implemented was to construct embankments and canals to isolate the land from the floodwaters. The colonisers' objective, however, caused difficulties for the Orissan peasants whose livelihood was reliant on such floods (D'Souza, 2006). Consequently, the colonisers' symbol of progress turned into a bane for the oppressed peasants. A common thread running through the political platforms of many Indian politicians from the era of colonial rule to the era immediately following independence is the need to manage water resources in order to reduce the frequency and severity of floods and to stimulate industrialisation. The Hirakud Dam, a large man-made structure in Orissa, was formed in independent India from a network of smaller canals and embankments. The dam did open up a lot of possibilities, such as electricity, irrigation, and flood control, but it also brought certain drawbacks. It is possible to see the advantages and disadvantages of the Dam in Orissa and globally through the lens of targeting a specific demographic. The disadvantaged will bear the burden while the well-off reap the rewards. As a result, this paper lays out a boring argument on the pros and cons of large dams, using the Hirakud Dam as an example with worldwide transnational advertising and protests as support and opposition.

Politics of Water in Colonial Orissa

In both colonial and postcolonial India, the water dilemma has remained front and centre. On a national, state, and even regional scale, it is still divisive. The flood control regime serves as the starting point for the water question, which is where water politics come into play. People in Orissa used to think about floods as models of soil fertility and sources of silt before the colonial acquisition of the region. Although peasants did have management strategies, it did not mean that farms were not lost owing to excessive water levels. From hilly terrain to lowlands, the agricultural land's size and geography followed the terrain to the plains. According to D'Souza (2006), farmers would move their crops to higher ground when water levels reached lower areas of the land. It helped them keep their lives in check and ensured that they could continue to live. Before the British came to Orissa, the Marathas and Mughals were the rulers. As a tactic, the Mughals and the Marathas both offered the peasants exemptions from paying taxes on the crops that were washed away in the floods. The key to maintaining a friendly relationship between the peasants and the monarchs was understanding and being

flexible. According to D'Souza (2006), the Mughal-Maratha system of agricultural management relied on a non-capitalist order that upheld social forms. When things were tough, this arrangement allowed the peasants, particularly the poorer ones, to rest a bit.

Agricultural grounds were not only submerged by the floodwaters, but they were also rekindled as they departed. After a flood, the peasants would reap the benefits of the soil's increased nutritional and productive capacity thanks to the red silt that had been absorbed by the water. The peasants used floods as a kind of fertiliser. This organic manure was vital to peasant life since it increased crop yields and improved crop quality. This system is referred to as the "flood dependent agrarian regime" by Rohan D'Souza (2006). He also notes how the colonial hands constructed this narrative of Orissa's transformation from flood reliant to flood vulnerable. Revenue collection was the primary objective of the British when they occupied Orissa. They utterly bombed at keeping a steady stream of funds going into the colonial deposits because of the annual floods. Accordingly, they started by accusing the Mughals and Maratha administration of failing to keep accurate records and subjecting the people to the brutal floods. They twisted the conversation by calling the hydraulic activity of water something other than what it actually is: a vulnerability (D'Souza, 2006). Instead of learning about the flood-friendly ecosystems that farmers had created to control the water and reap its benefits, they manipulated the discourse. Because of this, canals and embankments were built to manage the flow of water. Disrupted the land's supply of silt and mud, cut off the land's ability to receive natural irrigation, and forced hundreds of people to leave their homes.

It was noted that the frequency of floods increased when the embankments were constructed in the Mahanadi delta. Prior to the overflow, the peasants who were aware of the predicted flood time had no idea how much water would be discharged from the embankments. Conversely, land assumed an economic shape. Formal and strict methods were imposed on the peasants, and they were also subjected to regular tax extraction. The British needed a new way of looking at Orissa's environment in order to set up this tax collecting system. By characterising the deltaic flooding as a natural disaster rather than a hydraulic process, they distanced the land from the unavoidable unpredictability caused by repeated hydraulic activities (D'Souza, 2006). What D'Souza (2006) terms as the "calamity of seasons" is actually the result of the capitalisation of farmland. The early attempts at controlling sources of water for the benefit of humans, which ultimately led to the extinction of the human race, are detailed in this section, which relies heavily on Rohan D'Souza's claims of the colonial

water history of Orissa. I go on to analyse the situation in India after its independence in the parts that follow.

Hirakud: Big Dams in Post-Colonial India

One of three dams constructed on the Mahanadi River—the others being at Naraj and Tikarpada—the Hirakud Dam is located in Orissa and is a part of the development of the Mahanadi basin. During the building of the dam, the main objective was to control the flow of the Mahanadi River in order to avoid flooding, enhance living conditions, generate electricity, make navigation easier, and eradicate diseases, starvation, and malnutrition. On March 15, 1946, Sir Hawthorne Lewis, the governor of Orissa, deposited the foundation stone of the dam. After receiving a report in 1947, construction commenced in 1948. Prime Minister Jawaharlal Nehru formally opened it on 13 January 1957 after it was completed in 1956 (Nayak, 2013). During this time, building dams was thought of as the same as building nations. Some individuals had to lose their jobs since this nation-building effort was apparently in the public interest. Being led by Nehru's modernist vision and speaking the "language of big," the newly independent India was maturing into a mature country. Dams, industries, roadways, and government buildings are all examples of enormous constructions. Initiated nationwide mega-dam projects include the Bhakhra Nangal in Punjab, the Hirakud Dam in Orissa, the Kosi River project in Bihar, and the Tungbhadra project in Tamil Nadu and Andhra Pradesh (Nayak, 2013). In a nation that had only recently achieved its freedom, this language was determining what meant progress and modernity. Accordingly, in 1948, Jawaharlal Nehru stated to the people who would be displaced by the Hirakud project, "If you are to suffer, you should suffer in the interest of the country."

Being five km long, the main dam was one of the longest river dams in the world. The concrete dam extended 1.2 km in length, while the earthen dam spanned 3.8 km. Vast 743 square km comprised the reservoir. It comprised the undivided districts of Sambalpur and Raigarh in addition to what is today the Indian state of Chhattisgarh. Spanning 3373.83 km in all, the canal network was extensive. Two important canals ran parallel to the river on its right bank; the bigger of the two, the Bargarh, linked the Bargarh, Sambalpur, and Sonapur districts. According to Meher (2011), the Sason canal was located on the other side. This network of embankments and canals is located in Deltaic Orissa on the eastern side. Located in the Mahanadi River's delta, these rivers originate in Chhattisgarh, meander across Orissa, and eventually empty into the ocean after splitting into smaller ones. Several rivers, including the Kathajodi,

Kuakhai, Devi, Brahmani, and Baitarnai, are part of a low-lying area that is prone to flooding. The alluvial soil that rivers deposited in Eastern Orissa, also called deltaic Orissa, was beneficial. The flat terrain made it easy to build canals that could carry water long distances, and the nutrient-rich soil made it perfect for cultivation (Baboo, 2009). While Eastern Orissa benefited from the water development measures, Western Orissa lagged behind, leading to regional inequality that will be discussed more in the section that follows.

Eastern and Western Orissa: A Case of Regional Water Disparity

As far as earthen dams go, Hirakud Dam is the longest on Earth. Orissa is now home to seven major irrigation projects and countless of smaller ones. Water disputes have broken out between the states of Chhattisgarh, Jharkhand, Andhra Pradesh, and Orissa. Within Orissa, there have been disagreements between districts over this matter. As a component of the Hirakud Dam, a network of canals was constructed along the shore in the eastern section of the state. Orissa is divided between plains and hills due to its physical position. In contrast to the hilly terrain of Western Orissa, the Eastern region is mostly flat. As a result of the hill-plain split, the inhabitants of Orissa state are now divided into two socioeconomic classes: the haves and the have-nots (Baboo, 2009). The construction of the Hirakud dam served to further divide Orissa's two major cultural regions, the Western and Eastern regions. Sambalpur, in western Orissa, rose to prominence as a result of its proximity to the bank. Similar to the other major city of Cuttack in Eastern Orissa, it grew as a commercial and agricultural hub. Nearly forty-three villages in hilly and wooded Eastern Orissa were allegedly uprooted in order to make way for the dam building, according to Balgovind Baboo (2009). Even higher into the hillier region were these people moved. Those living on the eastern side of Orissa were the ones to reap the advantages of the Sambalpur canal, while those in the western part of the state were left out. There has been little improvement to the mining and road infrastructure in Western Orissa. It was devoid of any infrastructure, including railroads and bridges. Meanwhile, being dependent on hydraulic flooding meant that it was always at risk of drought.

People in the Sambalpur area of Orissa expressed their anger in 1945 through a protest due to the region's obvious water imbalance. The displacement of entire communities, the devastation of their way of life, the loss of arable land, and other forms of dispossession were all points of contention. It was thought that the development efforts in Western Orissa were secondary to the primary goal of constructing the

Hirakud Dam, which was to safeguard the city of Cuttack from the devastating Mahanadi floods. The western part of Orissa was left in the dark while all the major offices, transport hubs and schools sprung up on the eastern side (Baboo, 2009). This kind of unequal development approach prompted several enquiries into the methods used to selectively construct mega-dam projects in order to generate capitalist gains while relegating a significant portion of the people to the fringes. Even the canal system was not spared from the water wars that raged between Western and Eastern Orissa. The primary canal of Bargarh is the subject of a water dispute, as described by Rajkishor Meher (2011). There were three sections to the canal: the top, middle, and bottom. Now, there were disagreements about the distribution of water for agricultural irrigation inside and between the various sections of the canal division. Farmers in the upper and intermediate reach villages have also lost and fought over how much water they may limit in the downstream section of the canal so that they can cultivate more seasonal crops. This makes one wonder if the benefits of massive dams were completely free or if there was a price that people had to pay.

Costs and Benefits: A Debate Between Proponents and Opponents

Many people view dams as representations of progress because of their multifaceted utility. However, they frequently bring up grave problems that the ousted people are facing. Proponents and opponents of the large dams engage in a cost-benefit analysis as a result. The basic promise of dams is an abundance of electricity and water. They help with infrastructure, economic growth, producing hydropower, managing floods, and irrigating crops with water from a network of canals. Many people throughout the world believe that large dams may help with social and economic development, alleviate poverty, improve rural areas, and end food insecurity (Nayak, 2013). Dams are important for nation-building, and Pandit Nehru saw a connection between humans and them. A nation is considered modern-developed if it is associated with the nations that built dams. Dams like this, says Khagram (2004), gave rise to a powerful alliance of property owners. The wealthy farmers benefited from irrigation, the manufacturers from electricity, and the highly educated and respected public officers and engineers from status. The advocates of large dams, as pointed out by Rajendra Vora (2009), boast about how these projects have boosted national wealth and created jobs. On the other hand, some say that these initiatives will unfairly enrich one group of Indians at the expense of another. Every such project is pushed by the state under the garb of public interest and it demands sacrifice on the part of a particular section of the population.

Large dams as agents of change and development is a narrative that Daniel Klingensmith (2007) has called “Big is Beautiful”. The allocation of advantages from large dams is one contentious issue that has persisted throughout history. In response, it is important to note that this advantage has invariably come at the expense of some. The issue, according to Nelson Mandela, is not the dams but rather the townships’ lack of light, water, and sanitation, as well as the residents’ starvation (Rangachari, 2006). Worldwide, those who are opposed to large dams raise the same concerns about cultural loss, environmental damage, and livelihood loss. A case study on the Hirakud dam illustrates the hardships endured by the evicted. More than 200 settlements were drowned and 22,000 people were forcibly removed, as shown in it. Approximately 4,000 households were not eligible for compensation, and only a small fraction of them were relocated by the state (Baboo, 2009). When building started in 1948 in India, the country’s Land Acquisition Act was in effect, allowing for the forced relocation of local residents without any compensation or rehabilitation plans. The livelihood was significantly affected. People from indigenous and tribal communities were left out in the cold because they lacked the accurate land documents necessary to get compensation. The same thing happened to religious leaders and priests: they had their donated lands appropriated without offering any kind of recompense. Host communities and displaced peoples were at odds in the places these people relocated. Problems with health include parasite and vector-borne infections, children missing school, mothers having to work longer hours, and males drinking too much were all reported (Nayak, 2013).

One big problem was people losing touch with who they were; in the settled villages, everyone knew the sarpanch and could get all their paperwork in order to get government benefits, but in the resettled and newly displaced villages, nobody knew anyone and nobody could help them get a caste or residential certificate. As an example, consider the Teleliabhahal resettlement site in Jharsuguda district, where fifteen people were found to be living below the poverty line due to a lack of access to clean water and electricity (Dansana, 2021). The frequency of floods has risen, leading to droughts in Western Orissa, even after large dams were constructed to manage floods. Analysing the international advocacy in the last part reveals a similar argument in the case of the campaign against these huge dam projects.

Big Dams and Transnational Advocacy

As a result of the criticisms levelled at the huge dam construction projects, a transnational advocacy network emerged, which helped establish the World Commission on Dams

and its remit to assess the development efficacy of the dams. Two distinct plans for dam-based development have been put forward. The top-bottom and bottom-top methods respectively. Optimal social and environmental sustainability is the goal of the latter. As a result, several global organisations have been established, such as the International Commission on major Dams, whose aim is to gather data, coordinate efforts, and share expertise in the field of major dam construction (Khagram, 2004). Public and commercial entities are able to engage in dialogue about the complexities and effects of proposed developments through the release of environmental impact assessment reports. Worldwide, dam construction started in the 1940s; it wasn't until the oil crisis of 1973–1979 that the global economy felt the effects and the pace of dam construction halted. It all started in the industrialised world, but the emerging and least developed world quickly caught on to the construction frenzy and built massive dams. Within the framework of global lobbying, I offer four examples from various nations, excluding the Hirakud Dam instance from India. When faced with the economic crisis, Brazil opted for the top-down, technocratic strategy. The authoritarian bureaucracy that came to power in Brazil following the 1964 coup solidified the country's statist and capitalist paradigm of intense growth, according to Khagram (2004). Displacement of five thousand households occurred as a result of the Xingu River Basin project. Protests and subsequent suppression were common responses to public outcry over controversial projects like Itaipu Dam. Legislation aimed at protecting indigenous communities was drafted following the Geneva Conventions. As a result, the government was compelled to pass environmental protection legislation.

Human rights and environmental protection were two areas where Indonesian NGOs were active. Additionally, they orchestrated demonstrations, which the dictatorial government crushed. Democracy has taken place in South Africa, in contrast to Indonesia, although domestic popular mobilisation has been weaker. As a result of transnational advocacy, organisations pushed on institutions like the World Bank to withhold loans in order to safeguard the interests of their people. As a result, countries like China, which lives under the shadow of dictatorship, have seen a huge push for large dam projects, which were brutally crushed even when they received criticism. Many nations have experienced this, including China, India, and Brazil. Protesters in Kerala wanted Prime Minister Indira Gandhi to investigate the Silent Valley project's potential negative effects on the environment and local communities. Following mounting public outcry and official reports, the government shelved the proposal and took measures to preserve the land (Khagram, 2004). Through these events, we can see the varied

ways in which transnational advocacy, in the form of non-governmental organisations (NGOs) and other agencies, has helped nations avoid the problems that come with mega-developmental projects. We can also see how different nations' experiences with social mobilisation have been shaped by the link between democracy and the freedom to protest and speak out. The post-colonial era saw the construction of large dams in India as synonymous with the nation's growth, and this association has persisted to this day (Roy, 1999). Prime Minister Jawaharlal Nehru's renowned promotion of large dams as the "Temples of Modern India" after independence became a cornerstone of Indian nationalism and was subsequently included in school curricula (Nehru, 1954; Roy, 1999). Nehru (1954) praised the Bhakra Nangal dam and other large-scale infrastructure projects as great undertakings that represented the resolve, fortitude, and might of a nation.

According to Roy (1999), the dominant development paradigm in the nation constantly touts dams as a means to alleviate poverty and famine. According to federal and state officials, these projects are consistently justified by citing the "national interest," which states that the country's economic growth depends on maximising irrigation and power generation (Baviskar, 1995; Khagram). The result is an ideology that promotes progress as something that everyone should strive for, while justifying the uprooting of local populations as an honourable and vital sacrifice for the greater good of the "nation" (Baviskar, 1995). Opposing or questioning the efficacy of major dams is frequently viewed as a highly subversive act, bordering on sedition, because to the strong association between nationalism and their development (Roy, 1999). The peasants of the Narmada Valley, for example, who stood in water up to their chests for days in protest of the Sardar Sarovar Dam, are sometimes characterised as "anti national" and "anti development" when they oppose the projects' forced relocation (Roy, 1999). To preserve their independence and avoid being labelled as anti-nationalist plotters by the government, grassroots movements opposing the dams have had to deliberately refuse foreign assistance (Khagram). Opposition to national dam projects has been met with brutal persecution on a regular basis by the state, which views dissenters as dangers to national security. The government of Gujarat used the Official Secrets Act to restrict 12 Narmada Valley villages in an effort to suppress growing opposition to the Sardar Sarovar Project (Khagram; Paranjpye, 1990). This granted the government broad rights to restrict freedom of expression, limit access to information, and arrest anyone who opposed the dam project on the pretext that they endangered the nation's security (Khagram).

Protesters and activists who were peaceful were subjected to tear gas, lathi charges, and a large number of arrests (Baviskar, 1995; Khagram). Extreme police brutality has been used by the state to force villagers to flee their homes (Baviskar, 1995). Protesters, especially women, have been subjected to physical violence, including having their clothing torn off and pulled by their hair, while activists have been beaten severely, tortured while in police custody, and incarcerated on false accusations (Baviskar, 1995). As a result of their dissent, writers and intellectuals have also been subject to legal retaliation. Attempts to “pollute the stream of justice” and undermine the dignity of the Supreme Court were alleged by the Gujarat Government in their petition demanding criminal action and contempt of court proceedings against author Arundhati Roy, following her 1999 essay criticising the Sardar Sarovar Dam and its human costs (Roy, 1999).

Ignoring Collective Cost of Development

Concerning massive development projects like the Narmada River Valley dams, Khagram claims that state officials and planners have traditionally adhered to a technocratic, top-down approach. Despite the many social, environmental, and cultural costs to local residents, this vision has persistently prioritised economic success. When calculating the advantages and expenses of a project, the huge human and environmental costs are sometimes overlooked. Environmental destruction, such as the flooding of whole forests, the devastation of estuaries, the loss of species, and enormous waterlogging, is grossly underreported in the official budgets of these projects (Roy, 1999). Furthermore, indigenous Adivasis and Dalits, whose whole way of life is irretrievably uprooted, suffer particularly severe social and cultural harm, which development equations fail to account for (Hussain, 2008). Irrigation and power generation (Khagram) were the primary concerns of early planners like the Narmada Water Disputes Tribunal (NWDT) and the Narmada Water Resources Development Committee (NWRDC), who failed to consider the rights of displaced people or the environmental consequences in the long run.

When the economic impacts of displacement are acknowledged, compensation is rarely delivered properly and equitably. For instance, thousands of people who have been displaced, the secondary victims and marginalised people who have no official land titles (often called “encroachers”) are not compensated for because the definition of a “project affected person” is very narrowly defined (Baviskar, 1995; Roy, 1999). The reality for the legally recognised is incredibly sad; the poorest peoples are often given

small sums of money or forced to leave the fertile, riverine, or stony areas where they had lived because of flooding or other natural disasters (Roy, 1999). Forced relocation sometimes drives vulnerable populations into absolute poverty as these projects drain communities of their natural resource base, replacing their self-sufficient livelihoods with an antagonistic reliance on daily wage labour (Roy, 1999).

Compensation as a Mere Negotiating Tool

The most cynical aspect of the situation is that the Resettlement and Rehabilitation (R&R) problem was used as a bargaining chip in violent interstate political battles (Khagram), rather than arising from a sincere concern for human rights and welfare. Competing governments utilised resettlement as a bargaining chip in their fight over the Narmada River Valley master development plan, which is where the issue first gained political traction (Khagram). Governments in Maharashtra and Madhya Pradesh, for instance, utilised the massive and intricate rehabilitation needs as a potent political weapon to block the Sardar Sarovar Project (Khagram). The government of Gujarat responded by making lofty promises to relocate all displaced families without performing sufficient feasibility studies. This was likely done to avoid political obstacles and the realisation that they would never be held accountable for implementing these promises (Khagram). Massive river valley development projects in India, including the Sardar Sarovar Project (SSP) and the Narmada Valley dams, have created a massive chasm between the well-off and the downtrodden. According to Hussain (2008), the monetarily and politically powerful disproportionately reap the benefits of these publicly funded development initiatives. Dam developers frequently strip locals of their riparian rights in order to provide urban centers and wealthy elites with water and power (Baviskar, 1995). Most of the produced power and water goes to affluent, upper-caste farmers and cities (Baviskar, 1995; Khagram). The water in Gujarat has been redirected to politically influential and agriculturally prosperous regions such as Ahmedabad, Mehsana, and Kheda (Roy, 1999).

At the head of the canal, a number of influential political players had permits issued to dozens of huge sugar mills, despite the government's claims that water-guzzling cash crops would be outlawed so that water could reach drought-prone areas (Roy, 1999). The promised water will end up going to the urban elite at the expense of the countryside, since it will have to make its way via government-sanctioned water parks, golf courses, and luxury hotels in order to fund the project (Roy, 1999). Most of these initiatives would have a negative impact on India's poorest, most marginalised,

and ecologically sensitive people. There are a lot of displaced people from these towns. As an example, according to Hussain (2008), out of all the displaced individuals in India who are affected by development, the Adivasis make up around 40% to 50%, even though they only make up 8% of the entire population. Official lists of “project affected persons” completely omit hundreds of thousands of people—including downstream fisherfolk, people evicted for wildlife sanctuaries, and those without formal land titles, who are referred to as “encroachers”—and they receive no compensation whatsoever (Roy, 1999). Displaced peoples lose their ability to provide for themselves, and many wind up living in urban slums as a source of cheap labour after being uprooted from their traditional homelands (Baviskar, 1995; Roy, 1999).

Underperformance and Broken Promises

Despite the constant claims made by those in favour of the Narmada dams, the projects have consistently fallen short of expectations and have not fulfilled their primary objectives of ensuring food security, increasing power output, and providing access to potable water. This underperformance is illustrated by the first Narmada dam, which was finished in 1990. It displaced 114,000 people instead of the anticipated 70,000, cost ten times as much as planned, and drowned three times as much land as engineers had anticipated (Roy, 1999). In reality, it only irrigates the area that it submerged, which is about 5% of the land that was initially planned to be irrigated (Roy, 1999). The provision of irrigation and drinkable water to the acutely arid regions of Kutch and Saurashtra was a primary motivation for the SSP. However, the canal system ends at these locations. According to Roy (1999), the project’s water allocations will result in the irrigation of just 1.8% of Kutch’s arable land and 9% of Saurashtra’s arable land. Even more concerning is the fact that no such plans were found when independent reviewers requested to examine them (Roy, 1999). The enormous pipeline infrastructure needed to transport water to these outlying settlements was not even considered.

In order to defend the merits of the SSP, the underlying data was completely wrong. According to Roy (1999), the actual flow data showed that the Narmada River had 18% less water than what the designers had initially projected. In addition, the project’s irrigation efficiency was expected to reach 60% without any justification, even though India’s highest irrigation efficiency to date is just 35% (Roy, 1999). Systemic failures affect all of India’s big dams. Current reservoirs are depleting at an alarming rate, cutting their expected lifespans in half or even in quarters. Additionally, around 22 percent of the power that is produced is wasted as a result of gearbox and system

inefficiencies (Roy, 1999). The fight for the development of Narmada Valley is one of the most important and significant battles in the evolution of the development of modern India. It highlights a huge ideological divide between two groups of people, some of whom back the building of infrastructure on a massive scale with public funds and others, who oppose it, who pay the staggering costs.

Emergence of the Protest and Its Demands

Protests against the Sardar Sarovar Project (SSP) and the bigger Narmada Valley Development Project (NVDP) started in 1978 in the Nimar district of Madhya Pradesh, shortly after the ruling was handed down by the Narmada Water Disputes Tribunal. Initially spearheaded by middle-class farmers who were afraid about flooding, the campaign gradually disintegrated as local politicians became involved (Baviskar, 1995; Khagram). The indigenous Adivasi people of Gujarat and Maharashtra were re-energised in the mid-1980s by NGOs, social scientists (such as Medha Patkar), and individual activists (Baviskar, 1995; Khagram). Adequate R&R for the displaced persons was the principal demand of these grassroots groups initially (Baviskar, 1995). The protest, however, took a new turn when the serious environmental consequences and the state's inability or unwillingness to adequately relocate the hundreds of thousands of impacted people became apparent. In 1989, a number of organisations came together to form what is now known as the Narmada Bachao Andolan (NBA), the "Save the Narmada Movement." After initially calling for improved compensation, the movement eventually rejected the dam projects outright (Baviskar, 1995). They use slogans like "Koi nahin hatega!" as rallying cries. Someone must be saying, "No one will move!" Underscoring their desire for a thorough evaluation of the projects and the implementation of decentralised, socially equitable, and environmentally sustainable development alternatives, they proclaimed, "The dam will not be built!" (Baviskar, 1995; Khagram).

Proponents of the enormous dams included powerful members of society, such as state and federal administrations, urban elites, wealthy landowners, industry interests (such as the sugar lobby), and initially, international financial institutions (such as the World Bank) (Baviskar, 1995; Roy, 1999). According to Nehru (1954) and Roy (1999), the proponents of dams, who adhere to the prevailing technocratic worldview, revere them as the "Temples of Modern India" and the zenith of national progress. They argue that large-scale irrigation and hydroelectric power are the solution to India's power outages and food security problems. The SSP was put into action by the government

because they believed it was the only way to deliver irrigation and potable water to the very drought-prone regions of Kutch and Saurashtra (Roy, 1999). According to this ideology, the uprooting of indigenous populations is justified by claiming it is necessary to protect the “national interest” (Baviskar, 1995). Native Adivasis, Dalits, and landless peasants are among the oppressed groups who oppose the project, which also includes environmentalists, human rights advocates, and international nongovernmental organisations (NGOs) (Baviskar, 1995; Hussain, 2008; Khagram). Some people think that the wealthy and powerful take advantage of these programs while the poor and powerless end up paying a disproportionate share of the terrible expenses (Baviskar, 1995). Noting, for example, that politically powerful, water-intensive cash crop regions and urban centers are frequently given water that should have gone to drought-prone areas, these projects are economically unsustainable and characterised by inflated benefits and inflated costs (Roy, 1999; Paranjpye, 1990). Those who are against it argue that the term “national development” is a smokescreen for the state and its affluent elites to steal from the environment and local populations (Baviskar, 1995; Hussain, 2008). Official economic balance sheets fail to reflect the substantial costs that are routinely disregarded by the developmental paradigm that is propelling the Narmada projects (Roy, 1999).

A continuous record of human history is in danger of being erased due to the dams’ development. Submerged in the reservoirs are holy woods, temples, old pilgrimage routes, and Stone Age archaeological sites (Roy, 1999). The destruction of the Adivasi people’s cultural sovereignty by the projects is even more tragic. The forest and river are fundamental to their identity, worldview, and social structure, which is largely equitable (Baviskar, 1995). They are uprooted from their traditional, self-sufficient lifestyle and thrust into an unfamiliar, contemporary world where they are compelled to learn new languages, handle money, and work as wage labourers under the oppressive regime. A tremendous and irreparable cultural loss has occurred as a result of these formerly proud and self-sufficient tribes becoming poor beggars (Roy, 1999). The massive environmental damage caused by the Narmada projects has been largely overlooked by those in charge of the projects. Paranjpye (1990) and Roy (1999) found that tens of thousands of hectares of valuable forests and animal habitats will be submerged by the reservoirs, leading to a significant loss of biodiversity. Dams also have a disastrous effect on aquatic life downstream, killing out species like freshwater prawns and Hilsa fish (Roy, 1999). Aside from the salinisation and systematic water logging of the command regions, another ecological tragedy is the quick siltation of reservoirs, which cuts

their lifespan in half. Additionally, there is the possibility of seismic activity linked to impounding such large amounts of water (Paranjpye, 1990; Roy, 1999; Khagram).

One of the most devastating aspects of the evolution is the impact on society. According to Hussain (2008) and Roy (1999), the bulk of the victims who will be displaced by the Narmada projects are Adivasis and Dalits, and the number of persons displaced might reach hundreds of thousands. State officials intentionally leave out “encroachers” (those without legal claim to the land), “secondary victims” (such as downstream fishermen), and “those displaced by canal construction or compensatory afforestation,” who are denied compensation, from the list of “project affected” (Roy, 1999; Khagram). Police brutality, arbitrary arrest, and the enforcement of harsh laws such as the Official Secrets Act are all forms of governmental persecution that the people face (Baviskar, 1995; Khagram). At the end of the day, people are ripped from their communities and thrown into tin sheds in unusable wastelands or urban slums. This causes them to be completely destitute, starve to death, and suffer the terrible loss of their dignity (Roy, 1999). Jawaharlal Nehru’s rhetorical flourish during the 8 July 1954 inauguration of the Bhakra-Nangal dam has been both a reality and a source of irritation for the last seven decades. According to Nehru (1954, as recounted in Mukherjee 2007, p. 224), when speaking to the assembled throng, he referred to these buildings as “temples of the new age”—sanctuaries that accommodated the developing state rather than the divine. This metaphor was chosen on purpose. The dam was a symbol of secular reason, state capability, and the hope that modernity could provide what colonialism had failed to provide in a country that was still recovering from the deep displacements caused by Partition. More than 24,000 people, mostly from the old Princely State of Bilaspur, had already been or were being forced to flee their homes, farms, and ancestral lands, as the Gobind Sagar reservoir was being built on top of them (Haines, 2021; Rangachari, 2006). This was all part of the complex that Nehru had celebrated.

The primary conflict that this project will investigate is the paradox between the promise of the dam and the price paid by people whose lands and lives it was constructed upon. We are to analyse the worldwide promotion and protest of dams, as well as their costs and advantages, in response to the instructional question. The biggest dam project in postcolonial India’s first decade of independent rule, Bhakra-Nangal is the primary subject of this assignment, which also draws on comparative situations to contextualise its significance. The article presents four main points: first, that the Bhakra-Nangal was built and promoted during a global ideological era when big infrastructure projects were seen as synonymous with development;

second, that a large portion of north and western India reaped substantial material benefits from the dam; third, that these benefits came at the expense of human lives, the environment, and democracy; and finally, that opposition to dams, which started with the Mulshi Satyagraha before India gained independence, developed into a worldwide counter-mobilization that ultimately compelled a reckoning with the mega-project model of development. The central thesis is that Bhakra-Nangal's narrative requires the type of ethically serious, historically based analysis that leading academics in this field have started to offer, and cannot be portrayed as a story of pure triumph or tragedy.

Dams as Development: The Global Architecture of a Modernist Vision

The first step in understanding Bhakra-Nangal is to know the intellectual and political atmosphere of its birth. Midway through the twentieth century was the zenith of the "high modernist" school of thought, asserts James C. Scott. This ideology persisted to the point where its adherents were certain that the application of scientific knowledge and central planning could bring about positive, systemic changes in both society and the environment (Scott, 2006). Dams, steel mills, and roads were symbols and tools of decolonisation around the world. In his conceptual history of nationalism and dam building, Klingensmith (2007) demonstrates that the engineers and planners from India were absorbing and modifying the TVA's (Tennessee Valley Authority) successful model. The TVA's electrification programs and dam network thrust a previously oppressed Appalachian region into the limelight, proving that science could succeed where markets and colonial governments had failed.

Dams were more than just architectural feats; they were political declarations at this global juncture. They associated the central tenet of the post-war development doctrine, the idea that poor countries could fast-track their economic transition from centuries to decades with the "strategic deployment of capital and technology." (Khagram, 2004) The construction of big dams gave a demonstration to the world and to a people who had suffered from colonial oppression and the savagery of Partition, that the state would act on a grand scale, particularly in the case of newly independent states such as India. This, Klingensmith (2007) said, turned dams into a tool in the nation's effort to create a nation. These projects were entangled in transnational webs of financial knowledge and ideology, as Khagram's (2004) comparative research of dams and development across several nations further reveals. As a national initiative and a manifestation of Cold War development politics, Bhakra-Nangal in India was shaped

by a complex web of relationships involving World Bank finance, American technical help, and Soviet-model planning. Asserting and negotiating Indian sovereignty, foreign finance, and technical competence all took place at the dam. To understand the intense promotion of the project and the uneven distribution of its expenses, it is necessary to understand this backdrop.

The Promotion of Bhakra-Nangal

The level of dedication and effort put into promoting Bhakra-Nangal was unparalleled by any other megaproject in India's history. The causes were numerous and they reinforced each other. This initiative dealt with a serious problem at the level of ground-level practical politics. After decades of being nourished by canal-irrigated land, Indian Punjab was cut off from much of it in 1947's Partition. Overnight, the Hindu and Sikh peasant populations that had worked in the canal colonies of what is now Pakistan were evicted, according to the Government of East Punjab (Haines, 2021). The magnitude and political sensitivity of the refugee crisis were unprecedented. New irrigated areas in the Indian Punjab were proposed by Bhakra-Nangal, offering a symbolic recompense for the losses caused by Partition and the possibility of livelihoods for the people. Achieving quick economic change was a fundamental ideological tenet of Nehru's regime. As pointed out by Haines (2021), the food crisis was both an economic and political issue in early postcolonial India. The capacity of the state to provide food for its inhabitants was closely tied to its assertion of popular sovereignty, making food a vital issue in the politics of citizenship and state legitimacy. Within this framework, Bhakra-Nangal was advocated for in a number of different forums at the same time. The dam came to be a symbol of the period in Hindi cinema and its popularity, even outside its geographical locality, as a result of government-produced films and brochures that spread its message (Haines 2021).

Political amalgamation of the semi-autonomous princely states was intricately connected with the promotion of Bhakra-Nangal. The dam site was in the former Princely State of Bilaspur, for no reason other than the requirements of the dam project, as illustrated in Haines's (2021) archival research. Lacking a genuine dedication to Bilaspuri autonomy, the national interest in controlling the dam site necessitated that the central government in New Delhi retain direct authority over Bilaspur instead of merging it with a nearby state. Political integration and development were not two separate but one and the same processes, and the language around national development worked to exclude other political avenues. According to an official's 1954 approving

letter, the wider national interest, as reflected in the Bhakra-Nangal complex, must take precedence over local voices (Haines, 2021, p. 21).

The Benefits of Bhakra-Nangal: Irrigation, Hydropower, and the Green Revolution

Denying the tangible advantages Bhakra-Nangal brought to a sizable portion of India's people would be intellectually dishonest. Notable accomplishments are documented in Rangachari's (2006) thorough socio-economic evaluation, the most extensive analysis of the project's effects. Millions of hectares of agricultural land in Punjab, Haryana, and Rajasthan that had relied on rainwater irrigation had been connected to the Bhakra Main Canal and its system of distributaries by the mid-1960s. The remarkable turnaround of Hissar district, which was formerly known as one of the most severely drought-prone "famine districts" in colonial Punjab, into an area of agricultural plenty enticed people from far and wide (Haines, 2021). In particular, the dam is noteworthy for its role in the Green Revolution that occurred in the late 1960s and early 1970s. Reliable regulated irrigation, such as that supplied by Bhakra-Nangal, was essential for the introduction of high-yielding wheat and rice cultivars that revolutionised agricultural output in India. Without the hydraulic infrastructure that Bhakra-Nangal supported, India's shift from being a net importer of food grains to being able to feed its own fast expanding population in the 1970s and 1980s would have been far more challenging, if not impossible (Iyer, 2006, as cited in Haines, 2021). This was not some abstract concept for people who lived through the 1960s food crises; it was a question of survival.

The dam also provided hydroelectric power, which was crucial for the electrification of the north-western part of India, in addition to its water supply function. The power generated by the project led to the development of industrial complexes in the region and created employment opportunities in the new towns and factories (Rangachari, 2006). The dam project helped to integrate what were once distinct political areas into a network of shared infrastructure, uniting states that had been conflicted prior to the construction of the dam (Haines, 2021). These are not trifling achievements and any attempt to minimize Bhakra-Nangal's achievements is a form of dishonesty.

The Human Costs of Submergence

The benefits of Bhakra-Nangal were felt nationwide in northwest India while the cost of the project was felt acutely. Almost 40,000 people, including 4,000 in Bilaspur town and 4,000 from the adjoining countryside, were displaced after 375 villages, of which 256 villages are in Bilaspur State, were submerged in the Gobind Sagar reservoir (Haines,

2021; Rangachari, 2006). This was no random set of numbers. They were farmers nestled among their social networks, rituals, and memories that would all be lost, and their families had long farmed the same terraced fields. The decision was made without consulting those who would be affected and the reservoir's footprint was expanded with the proposed increase in the height of the dam, making their situation that much more precarious (Haines, 2021). The following steps taken were inadequate rehabilitation. Before the reservoir occupied most of the land, there was already not enough land in Bilaspur to accommodate all the displaced residents. Haines (2021) has detailed the interstate territorial disputes and they were connected to the question of where Bilaspuris should be resettled. The administrative possibility was to move Bilaspuris to the desert lands of Rajasthan, but this idea was strongly suspected by others that the "hill people" would not be able to withstand the heat of the plains. Whilst paternalistic, this perspective acknowledged the cultural trauma that was caused by displacing mountain communities and moving them to unfamiliar terrains (Haines, 2021, p. 15). Out of the total population of displaced people, approximately one-third settled in HP, another third were given monetary compensation and they were responsible for their own settlement and the third were shifted to the command area of irrigation under the project (Rangachari, 2006). These communities' long-term trajectories, compensation, social and psychological costs of uprooting and loss of common property resources were never studied exhaustively.

Environmental Impacts

Rangachari (2006) has described the environmental damages that have been incurred because of the operation of the dams for many years. Engineers had foreseen the issue of siltation, or the slow buildup of silt that diminishes storage capacity over time, but they failed to fully grasp its magnitude. The upstream soil erosion in the Bilaspur catchment region was exacerbated by the forced displacement of long-term land managers and the subsequent destruction of forests for construction and resettlement, which in turn sped up the pace of siltation. Soil conservation efforts in the catchment region were disjointed and inadequate due to political rivalry between the states of Punjab, Himachal Pradesh, and PEPSU, all of which wanted control of the land while avoiding management responsibilities (Haines, 2021). The ecological repercussions downstream were very substantial. Seasonal flood patterns that had previously replenished groundwater and deposited nutrient-rich silt on agricultural land were altered by the management of the Sutlej's flow. Processes that Rohan D'Souza (2006) has investigated in his larger

work on colonial and postcolonial hydrology in South Asia include land degradation in some areas due to reduced sediment delivery downstream and waterlogging and soil salinisation in others caused by over-irrigation made possible by canal networks. Despite the fact that the ecological consequences of dam building were politically unseen due to their dispersed and slow-moving nature, they have had a considerable cumulative impact.

The Democratic Deficit

The democratic deficit, or the systematic subordination of representative governance to the imperatives of growth, is what Haines (2021) terms as one of Bhakra-Nangal's most consequential philosophical costs. With the advent of India's democratic constitution, several erstwhile princely states were granted elected local authorities; however, Bilaspur, being a region under direct central authority, was denied this privilege. The stated goal was to avoid having an elected state government impede discussions by claiming complete control of the dam site. According to Haines (2021, p. 9), the ministry's interest in the dam project took precedence over the political rights of the Bilaspuris while making key decisions about Bilaspur. In light of the fact that the constitution guaranteed basic rights and adult suffrage for all citizens, this was very ironic. The Bilaspuris were informed that the national interest in building the dam must take precedence over their right to political representation, and this argument was used to undermine democracy. The fact that national interests must take precedence over local desires was pointed up in an official letter from 1954 (Haines, 2021, p. 21). The Bilaspuris, however, were not only passive targets of this reasoning, as Haines (2021) demonstrates. In order to seek representation and acknowledgement for rehabilitation, they held public meetings, wrote petitions to New Delhi, and employed the same discourses of citizenship and progress that the state had used to defend its acts. Now, they were turning the tables on the government. Decades later, even greater protests would break out against the Narmada dams, but their mobilisation is a tiny version of that.

The World's First Anti-Dam Movement: The Mulshi Satyagraha

The conventional view holds that the Indian resistance against megadams began with the Narmada Bachao Andolan in the 1980s. A substantial amount of backtracking is necessary to rectify this presumption. Resistance to dam-induced displacement predates Indian independence by more than twenty-five years, as Rajendra Vora (2009) shows in his study of the Mulshi Satyagraha of 1920–1924, which he defines as the world's

first anti-dam movement. The Mulshi Satyagraha was an anti-dam movement that rallied people in modern-day Maharashtra along the Mula River, which lies near Pune. Submersion of the peasant communities and agricultural fields in the Mulshi valley was a real possibility due to the dam's reservoir. An anti-project movement emerged in reaction, with members taking cues from Gandhian ideals of peaceful civil disobedience. Numerous factors highlight the significance of Vora's (2009) account. First, it proves that the political awareness and ability to speak up for collective rights of dam-affected communities did not arise from action by NGOs or globalisation after the 1970s, but rather, it is an organic result of the dispossession itself. Secondly, it demonstrates that the displacement of peasant villages and the pursuit of cheap electricity by Bombay's textile mills constitute a structural aspect of dam construction, rather than an isolated incident. Most importantly for this comparison, the Mulshi Satyagraha demonstrates that it was the affected communities who initiated the ethical and political questioning, and so had a presence before environmental NGOs and international development agencies.

The Narmada Bachao Andolan and Transnational Anti-Dam Politics

The Mulshi Satyagraha was an anti-dam movement that rallied people in modern-day Maharashtra along the Mula River, which lies near Pune. In her groundbreaking study of the tribal tribes of the Narmada Valley, Amita Baviskar (1995/2004) details the fight of a collective of indigenous peoples, environmentalists, and human rights advocates against the megaproject paradigm of development, as well as against a specific dam.

The Cost of Living, a polemical essay by Arundhati Roy published in 2006, provided the most well-known worldwide expression of this opposition. According to Roy, there was a systematic pattern of dispossession in India when the government dealt with the adivasi, Dalit, and peasant communities that were displaced by dams. In this pattern, the urban and industrial classes reaped the benefits of development while the poor and marginalised bore the costs. Roy (2006) argues that her indictment was purposefully worded in a way that unified the Bhakra-Nangal, Narmada, and other dam projects into a coherent political logic based on the rationalisation of national development via the sacrifice of the few for the many. Khagram (2004) places the Narmada conflict in the context of a more general examination of the ways in which transnational advocacy networks altered the global politics surrounding dam construction. He presents examples from South Africa, India, and Brazil to support his claim that the formation of "transnational anti-dam coalitions" comprised of displaced locals, international

environmental NGOs, empathetic donor-state officials, and the world's media significantly changed the cost-benefit analysis that states and their financiers faced when building dams. The formerly impenetrable technocratic consensus surrounding mega dams started to crumble when, in 1993, the World Bank finally withdrew from the Sardar Sarovar project in response to pressure from this coalition.

In theory, the changes can be better interpreted as the result of an implicit logic that had been pursued by the Indian developmental state since Nehru, with economic development and the capacity of the state taking precedence over citizen engagement and democratic responsibility. In theory, the changes can be better understood through the prism offered by Jayal (2001), who claims that the Indian developmental state since Nehru was pursuing what he calls an unconscious logic, one that prioritized economic development and the capacity of the state over citizen engagement and democratic responsibility. This version of the anti-dam movement is not only about the idea that dams are somehow displacing people, but also that there is a specific vision of statehood that is being questioned, one in which technocratic rationality is detached from democratic scrutiny: "politics is messy and therefore not conducive to development" (as described by Chhotray, 2011, in Haines, 2021, p. 2). At its best, opposition to the dam was based on the premise that "Democracy is central to any growth" and that the anti-dam movement was thus directly challenging this assumption.

Global Dimensions: Dams as Development in Comparative Perspective

Historically, these are not unique conflicts in India as the Bhakra-Nangal conflict shows. As Khagram (2004) demonstrates, the construction of large dams in the developing world in the second half of the twentieth century was a repeat of the pattern. Coalitions of international financial institutions, technocratic elites and central governments supported these projects. All of them were valid benefits (watering agriculture, producing electricity, flood control), which enjoyed the benefit of the rich cities and farms. The communities most affected by the dam sites (many of the poorest and least politically influential) however, bore a disproportionate burden for their displacement, ecological fragmentation, and democratic marginalization. The Tennessee Valley Authority had a huge influence on Indian planners, and it did the same in the US as well, but with less displacement and better compensation (Klingensmith, 2007; Scott, 2006). In 2003, China's Three Gorges Dam resettled almost a million people, marking the largest relocation in history and casting doubt on the development boils for the sake of advancement rhetoric. The financial structure of megaprojects can be seen as a

reason for corruption scandals in South Africa (Lesotho Highlands Water Project) and in Brazil (Itaipu and Balbina dams) where the communities affected bear the burden of the plunder.

Like Bhakra-Nangal, the narratives here, too, show how megaprojects bring together technical, financial and political power in the hands of a select few, at the expense of those who ultimately have to pay. Scott (2006) notes that these kinds of “high modernist” type projects tend to simplify complex social and ecological arenas to a minimum level, so they can be grasped by the state. Sadly, as they go about their business, they destroy the local knowledge, social structure, and ecological diversity that made those landscapes productive and made people happy. The dam is a prime example of this: it changes the landscape in physical space, and in the course of the process often changes the social space that the landscape had been providing, in a way that is not reversible.

Bhakra-Nangal has helped kick off an anti-dam resistance movement that’s as old as the Mulshi Satyagraha and has continued through the Narmada Bachao Andolan. For instance, instead of opposing development per se, these protests call for a “fairer” development that is more equitable in terms of who bears the cost and who benefits, that provides impacted communities with a voice in decision-making, and that does not deny the local demand for justice through the rhetoric of the national good. Using the discourses of citizenship and democratic rights that they had gained via independence, the Bilaspuris were already articulating this demand in the early 1950s, as Haines (2021) argues. The degree to which such requests are either ignored or not given heed, shows that balancing the developing state’s aspirations and the rights of those whose lives and land it develops is an ongoing challenge. Seven decades after Nehru referred to dams as “temples of the new age,” the World Commission on Dams (2000) found that massive dams had forced 40–80 million people from their homes across the world and that the environmental and social consequences had been grossly undervalued, falling on the shoulders of the most vulnerable. This is a judgement on the entire paradigm of growth that Bhakra-Nangal represented, not just on the program itself. Constructing the infrastructure needed by a society that is both warming and water-stressed without re-enacting the moral lapses of the previous high modernist century is the great problem of the twenty-first century. To rise to that task, one must give due consideration to the painstakingly pieced together history of Rangachari, Klingensmith, Khagram, Haines, Baviskar, Vora, and Roy.

“A nation can progress only when the people are relieved of their miseries,” Nehru famously said during a speech he gave to lay the foundation of the Hirakud Dam. The

Mahanadi River, which had devastated Odisha in the past due to devastating floods, ran beside the dam. It was becoming a modernised state, the intellectual basis of Nehruvian policy. There was an underlying assumption that a newly independent India had to take the lead in achieving widespread improvement. The dams, industries, and power plants that Nehru envisioned came to symbolise the new order. This idea would later be solidified in his renowned statement about how these projects were “the temples of today (modern India)”. These initiatives have become a source of controversy for the same people they were pledged to help after almost a century of such adamant assertion of patriotic progress. When thinking about the evolution of civilisation, dams stand out. Their emergence as flagship initiatives coincided with the widespread belief that scientific logic could protect mankind from the fury of nature. Their belief was the main reason for their appeal to post-colonial governments that were yearning for reform. Dams were alluring due to their size, but they were also tremendously disruptive because to their sheer magnitude. In their definition of mega-projects, which “transform landscapes rapidly, intentionally, and profoundly in very visible ways,” Gellert and Lynch (2003) capture this dichotomy. They go on to say that these projects need “coordinated applications of capital and state power.”

Assuming control over people and the environment is an inevitable byproduct of building a megaproject. In this article, I will make an effort to do two things. First, I will try to put megaprojects in context by looking at how they have been presented as tools of growth in developing nations like India. Second, we’ll need to use comparative evidence from across the world and a short case study of the Damodar Valley Corporation (DVC), which is based on the American Tennessee Valley Authority (TVA). It contends that ideological, nationalist, and technocratic discourses have systematically promoted dams while ignoring their costs. Further, the question of “whose development is it?” has become more politicized in the manner in which benefits and burdens have been distributed consistently along pre-existing power lines.

Cost-Benefits Analysis of Dam Projects

Structural arrangements that justify the massive construction of dams across the state also continue to reflect this sectoral division of governance. Cost-benefit analysis is the leading paradigm used to evaluate dams, which is also based on linear thinking. It decomposes outputs of the river into measurable parts, assigns monetary values to each part and then provides the aggregate value as a basis for decision making. These are systematically ignored since ecological integrity, cultural loss, and the river as a

living system cannot be measured. This eliminates these concerns as decisions are made. Reasonable assessment of possible outcomes is the foundation of cost-benefit analysis (CBA) systems, as stated by Fischhoff (2015). Dam choices, however, include intangible, ethical considerations that can render this paradigm inadequate or perhaps unnecessary. Ecosystem services, cultural values of riverine communities, costs of structural displacement, effects on agriculture, coastal erosion, and delta production are all negatively impacted. There are also permanent ecological losses, such as species extinction, that are left behind. However, the political pressure to determine the level of sacrifice the state is willing to make is real. Quantifiable analysis actively builds a river model for river projects that makes dams look reasonable while hiding everything that cannot be bought. It builds its own version by determining what is considered a benefit and what is considered a penalty. Cost-benefit analysis (CBA) takes the population as a whole into account, therefore a huge gain for most people can compensate for a small number of people's terrible losses. As a result, dam evaluation starts to accept the plight of millions of displaced people. By turning the river into a ledger, CBA proactively blocks that view. The sectoral glance is finished when the river turns into a ledger. Once a living thing, the river is now just an accounting problem.

Asymmetric Distribution of Benefits

The fact that costs and benefits are spread out across multiple regions is a hallmark of big dams, as shown by Duflo and Pande (2007). Irrigation, reduced flooding, and power are all benefits that people residing in the command area downstream of a dam can enjoy. Those residing in the catchment region, which is immediately upstream of the reservoir, do not receive any irrigation advantages. In reality, it is the displaced people who end up footing the bill for things like water-borne diseases like malaria, schistosomiasis, and filariasis, as well as for the loss of arable and forestland, salinity increases, and flooding in the area surrounding the reservoir. Prior to the start of dam construction, there is a structural phenomenon referred to as "displacement." For the loss of livelihood, culture, everyday life and community fellowship it is as harmful as the actual deportation of the people. Secondly, it doesn't have to be paid by everyone. Minorities facing challenges and issues which are peculiar and heightened in Displaced Groups (Thakural, 1992). Take women, for example. They are disproportionately responsible for obtaining food and fodder after being uprooted from their original place. Because their claims are hard to identify within a logic based on property ownership, landless labourers and people without formal links to land are practically invisible under rehabilitation and

resettlement (R&R) frameworks. Compensation can only compensate for monetary losses, not qualitative ones, and thus highlights a major shortcoming of the system (Lahiri-Dutt, 2012).

Additionally, there is a large discrepancy between the reported and actual numbers of affected parties and persons. Menon et al. (2003) found that around 20 million cases were underreported in estimates made between 1951 and 1990. The widespread direct and indirect effects of relocation caused by construction projects on a large number of individuals are probably to blame for this. As an example, the Kaptai Dam in Bangladesh, which is situated on the Karnaphuli River, caused havoc among the local Hajong and Chakma populations after forcing them to flee to northeastern India as their homelands were submerged. Fish populations in the downstream catchment region started to decline as a result of ecological disturbance brought on by the 2002 commissioning of the Ranganadi Hydroelectric Project in Arunachal Pradesh, which left fishing communities in a state of severe distress owing to the large sedimentation deposits. The local tribal populations of Assam would face even greater future deprivations as a consequence of the demolition and uprooting of public and social institutions like libraries, schools, and temples brought about by the construction of the e Pagladiya Multipurpose Project on the Pagladiya River (Dutta, 2003).

Damming has long-term environmental impacts outside of the reservoir. Dams alter the natural flow regime of rivers by holding back water for a greater part of the monsoon season and regulating it during the dry season. Natural flow, silt and debris fluctuations are essential to maintaining the health of aquatic habitats, and with dammed water diverted to agriculture, additional risks to environmental flow and these habitats are present. Water from the Damodar River is subjected to an additional environmental strain as it flows through the coal belt of Jharkhand and passes through effluents from industrial sources which include fertiliser, cement, steel and coal washery plants even before it reaches Panchet Dam (Islam, Hoque & Ghosh, 2022). The problem of displacement is already a highly complex and fraught political matter in itself. Arundhati Roy (1999) states this conflict vividly when he says: “If you are to define ‘The Greater Common Good’ by the amount of water stored, the amount of electricity produced, or the hectares irrigated, you can argue that big dams are a necessary evil. But what happens to the equation when the number of displaced persons becomes a measure of ‘The Greater Common Good’? This is part of a larger problem: quantitative considerations are usually applied when assessing the value of big infrastructure projects, and these don’t necessarily include the human cost. To better grasp what is truly lost,

Sen and Nussbaum provide a moral framework. Their Capability Approach posits that the freedoms and opportunities accessible to individuals—the range of choices that permit a life of fulfilment and meaning—rather than material outputs should be used to gauge human development. According to this approach, displacement is not just the loss of land or income, but the contraction of an entire horizon of possibilities.

Protest and Resistance

The vast majority of indigenous lands are situated on the borders of hydropower extraction, making indigenous tribes one of the most mobilised and affected groups. The ideological schism at the core of post-independence development in India must be acknowledged in order to comprehend the opposition to massive dam projects in the country. Although tribal people only make up 8% of the population, they constitute 40-50% of the displaced people (Bene, Scheidel & Temper, 2018). Two opposing ideologies were passed down to the Indian government by Gandhi and Nehru, respectively, who wanted to build the country on the backs of rural economies and speed industrialisation (Raina, 2000). Victims of dams' displacement started organising around this lingering conflict. Beginning with the 1986 establishment of the Narmada Dharangrashtra Samiti in Maharashtra to fight the Sardar Sarovar Project, a sequence of events occurred in the Narmada valley that crystallised resistance. A key figure in the development of this movement was activist Medha Patkar, who traversed the valley and lived with villages that were under danger. People from the impacted villages, along with engineers, sociologists, and full-time activists, spearheaded the 1988-formed Narmada Bachao Andolan (NBA), a nationwide confederation of groups (Raina, 2000). The NBA stood for more than just the rejection of a particular dam. It demonstrated what Raina (2000) calls a more fundamental conflict: that disadvantaged groups are not only targets of development but rather keepers of distinct cultural traditions that are striving for survival in the face of greater political and economic forces.

The Siang Upper Multipurpose Project (SUMP) is being planned, not for development needs, but as a direct strategic response to China's Yaxia dam in Tibet upstream. This implies the people are being pushed into exile, the Adi people. The Adi's resistance is not just against physical relocation, but also for cultural preservation. The consent for dam projects is often pretense and not real; it is evident from the conditions of the MoU that is signed with the people of the Siang valley. In return for communities' approval to move on with a pre-feasibility study, the agreement offers a development package of Rs 5 crore spread out over three years. This package encompasses

infrastructure, health, as well as livelihood programs. Families who are likely to lose out from this project will be organizing a Village Development Committee (VDC) to monitor all the developments. At first appearances, this is a participatory approach. The survey is done before any official announcement of the project's scale, and it casts consent as a quid pro quo: communities get benefits in return for agreeing to a process of which they do not fully understand the full consequences. Losses of the land, river and cultural identity of the Adi people cannot be replaced by the MoU.

Case study — Damodar Valley Corporation

After we've covered the main issues of contention in dam construction—citing the Damodar Valley Corporation (DVC) as an example of a pioneering large-scale multifunctional dam—we can get down to the meat of the debate. In independent India, a number of daring and innovative development projects were launched, including the Damodar Valley Corporation (DVC). This concept was conceived during the devastating floods of 1943, which severed the East India Railway and disrupted military supply routes during WWII. The Americas' Tennessee Valley Authority (TVA) served as inspiration. In 1944, the Bengal Flood Enquiry Committee recommended the same location for a multi-use project, and the idea was put into motion. Transforming a “valley of death and destruction into a valley of prosperity and happiness” was supposedly its intended outcome (Hamilton, 1969). The DVC Act was the first development legislation put into effect after independence, enacted by the Constituent Assembly in 1948. A country may progress by extensive technological interference in nature, according to Nehru, and this move mirrored that idea. An irrigation network and four dams were constructed at Maithon, Panchet Hill, Konar, and Tilaiya as part of the project's initial stage. These dams could supply water to one million acres during the monsoon season and 300,000 acres during the dry season. The effort was portrayed as a triumph of rational scientific inquiry against the untamed river. The newly independent state's acceptance of a western philosophy in technology over nature was symbolised by the dam, according to Lahiri-Dutt (2003). So far, it was not feasible to invite the valley dwellers to participate. It was obvious that some would have to suffer for the greater good of the nation.

The DVC's disjointed institutional support was its fundamental structural problem. Although it was supported equally by the federal government, West Bengal, and Bihar, an autonomous company was ultimately accountable to the federal government. Bihar was initially disadvantaged since it had to pay to build reservoirs and relocate residents, while West Bengal reaped the benefits of flood control and irrigation thanks to this

tripartite framework. Since state administrations had delayed restoration, residents were still residing in reservoir regions in 1959, making the 1959 Flood Crisis all the more severe. Because of a prohibition on flooding residential areas in the DVC's own operational standards, 35% of the storage capacity was useless. Due to the lack of authority, the competing forces remained unresolved. Decisions were further delayed due to state politics (Hamilton, 1969). The role of larger nationalist emotions in shaping DVC's image is another important consideration. The TVA concept was proposed by Meghnad Saha, a crucial architect and member of the Damodar Committee, as a universal technical solution that was free of politics. The Soviet and American growth models were, in Saha's opinion, scientific victories over political ones, and logic was universal and unbiased. The result is an erasure of the two valleys' distinct topographies and hydrology as well as the complicated political history of the TVA. The river Damodar had flash floods and dry intervals, but the state of Tennessee saw precipitation throughout the year. Additionally, since the river was flowing across plains, there were few ideal places to build dams along its course. Regardless of these distinctions, the TVA paradigm was implemented in its entirety. According to Klingensmith (2007), Saha and the rest of the Damodar project committee remained silent on the forced relocation of residents. It was never considered as part of the original conceptualisation of the project.

This vision has a high human cost. In order to create room for the reservoirs, almost 100,000 people were forced to leave their homes, with a disproportionate number of adivasi and tribal populations being displaced (Lahiri-Dutt, 2003). What followed was a rehabilitation regimen that almost didn't work. Rehabilitated households accepted land at a rate of less than 5% by 1964, and only 161 of 343 dwellings constructed for displaced families were accepted. The money that was available for compensation was quickly depleted as almost everyone grabbed it (Hamilton, 1969). Resettlement was forced rather than negotiated, leaving displaced populations without proper remedy, since the DVC failed to engage with local citizens effectively, even though they held village meetings. The results on the farm were just as conflicting. The dams had a positive impact on the production of HYV crops but this was received very unevenly, as irrigation improved. Under the DVC system, irrigated boro rice, which uses a lot of water, had a very hard time. The project's primary goal was irrigation, but farmers had no idea when or if water would come because supply was neither timely nor assured. According to Lahiri-Dutt (2012), this unpredictability had devastating effects for households whose yearly income was heavily reliant on Boro farming. Due to the DVC's

inreliability, farmers began to recklessly pump groundwater, which led to a decline in the water table and subsequent periods of drought. The DVC has a profound impact on the environment by changing the hydrological regime of the Damodar. Hydrological systems that rely on the periodic movement of water, silt, and debris were negatively impacted by monsoon flow reductions and off-season discharge regulations (Hoque et al., 2022). The deterioration of the river, which was once called the “river of sorrow” became much worse due to industrial pollution from fertiliser factories, steel mills, and coal washeries upstream, which is what Hoque et al. (2022) refer to as a “river of agony.”

Conclusion

The scenario may be simply traced at a parallel from Thailand to Bilaspur to the Narmada valley. The dispossession of development’s victims follows a similar pattern. However, because to a lack of national and international social, political, and intellectual infrastructure, the state was able to conceal their concerns in the Bhakra-Nangal Dam issue. According to Haines, Nehru’s paternalistic approach is demonstrated by his recommendation that “hill people should go to a hill state” rather than addressing the demand of the Bilaspur oustees to dwell near the dam (2021). It would be unfair to discount the project’s success because of the substantial social and ecological expenses incurred by the affected areas and their inhabitants. This is consistent with what Dharmadhikary et al. call the “supernova metaphor”—a brief period of abundance followed by widespread destruction—(2005). Local people’s problems and well-being were overshadowed by the postcolonial state’s promise of nation-building. By going over the project’s pros and cons in great detail and providing a critical evaluation, as well as going into great detail about the social and ecological costs that were incurred, I have aimed to frame this article as a question against the development narrative: Who promises and who sacrifices? The preceding is an exhaustive and concurrent effort to address the same. There is more at play than a simple cost-benefit analysis when deciding which concept of development is most often discussed in public and policy forums within a particular sociopolitical setting. A more expansive political imagination is reflected in it instead. In the 1930s, when the United States was reeling from the effects of the Great Depression and a newly independent India was trying to find its footing, the conditions were ideal for the emergence of high modernist trends, of which the TVA and DVC were only two manifestations. Also, national leaders and planners believed in the “mythic” (Chandler, 1984) power of the contemporary capitalist view of social and natural engineering, and the endeavour to model Damodar valley after

Tennessee valley was a manifestation of that. Concepts of patriotism, anti-colonialism, and the benefit of humanity were more closely associated with TVA and the effort to recreate it in India than with tangible resources. The issues surrounding mega-water development projects are intricate and fraught with political tension. Despite the critical need for more objective and thorough before and post facto social and environmental impact assessments, rejecting the current discussion by just calling for them will not lead to a fruitful resolution. The dam topic has to be democratised and approached with a more people-centric focus. The expectations and ambitions of individuals who will be most immediately impacted by potential initiatives, as well as differences in technical and managerial abilities, as well as the (often unspoken) scientific uncertainty, will determine the optimal solutions. More likely to be successful and sustainable in the long term are community-driven, smaller-scale solutions (such as water collection or tiny dams).

It should be remembered that the huge dams' proponents and detractors are entangled in a dialectic of divergent models and visions of development. As a result, these conflicts shed light on how development rhetoric is shifting from an economic growth paradigm that is top-down, technocratic, and large-scale to one that is bottom-up, participatory, sustainable, and socially fair. Using the Hirakud Dam as an example, we may talk about mega-dam projects and how people often view them as emblems of progress. Beginning in the era of colonisation, dam construction became a means of controlling floods and water as well as land for financial gain. Orissa reaped numerous benefits from the post-independence Hirakud Dam, but it also exacerbated regional disparities, flooded villages, uprooted thousands of people, and left many without compensation or rehabilitation assistance. So, it's not fair to say that dams are completely good or bad. Both of them work together. There are those who gain and some who lose. Pay the price for patriotism. Because of resource constraints, governments may not be able to fulfil their goal of benefiting all citizens, including displaced people, by exchanging land or money for land. Simultaneously, it is frequently observed that international organisations and institutions have contributed to the failure of these initiatives by reducing the amount of money that these nations may borrow. This leads us to the conclusion that growth is a contentious topic that involves participation in some form or another.

The controversy surrounding the Narmada Valley Development Project proves, in the end, that state-sponsored "development" is fundamentally unequal and resource-intensive, rather than neutral and helpful to everybody (Baviskar, 1995). The state's

justification of dominant classes' resource appropriation through megadams is based on the "national interest," which forces the poorest populations to give up their homes, livelihoods, and cultural identities in the name of a greater good (Baviskar, 1995; Hussain, 2008). The severe problems and harsh outcomes of this top-down development model are brought to light by the systemic inadequacy of resettlement, the shocking and uncontrolled ecological destruction, and the use of compensation as a political bargaining chip (Hussain, 2008; Khagram; Roy, 1999). However, the myth of global progress has been discredited by the fact that the displaced communities have rebelled against the project (Narmada Bachao Andolan) and an international advocacy network (Baviskar, 1995; Khagram). The campaign was so successful that it transformed the Sardar Sarovar Project into a symbol of harmful development (Khagram), and it kept the World Bank from completing the project, which would have led to its advancement for years. The Narmada conflict is a strong illustration of how ecological sustainability, human rights, and cultural autonomy must underpin decentralised, participatory democracies if genuine development is to be achieved (Baviskar, 1995; Khagram; Paranjpye, 1990).

Despite what Nehru said, the Bhakra-Nangal Dam complex is neither a clear success nor a clear disaster, as its most vocal detractors have occasionally suggested. This case study exemplifies the complex nature of development, shedding light on the fact that tangible benefits can only be achieved at the expense of human lives, and that the question of how to allocate these benefits and costs is inherently political rather than technical. In this study, we have argued that the nationalist symbolism, Cold War development philosophy of technocratic authority, and the acute political urgency caused by Partition all came together to push the dam. This resulted in major advances in irrigation, food production, and electrification that enhanced the material welfare of millions of people of the north-west of India, and which could not be linked to "elite capture" or "false awareness". It appeared as a national development yet kept away democratic representation, drove away entire villages without proper rehabilitation and damaged the environment without taking responsibility for anybody. These consequences affected the residents of Bilaspur and its neighbouring regions the most. Throughout history, there has always been a gap between official promises and real life experiences of those engaged in dam building. It is recognised that an improved and prosperous future will not be achieved without cost; however, historically the poor and the vulnerable have been the ones who have paid the price. What comes out of these discussions about the dams' real implications for the people isn't a rejection of the dams

per se, but rather an examination of other perspectives on development. The river is commodified by the technocratic state, using a cost-benefit analysis and the state's point of view. This increases the normalisation of erasure of culture, environmental harm, and relocation as a price to pay for the greater good. In addition to the simple idea of growth, there needs to be a more comprehensive and vital development that can lead to a sustainable future that is more equitable, more ecological, and more participatory.

References

- Akhil Ranjan Dutta. (2003). Pagladiya Project: Poor Rehabilitation of Oustees. *Economic and Political Weekly*, 38(49), 5149–5153.
- Anand, P., Hunter, G., & Smith, R. (2005). Capabilities and well-being: evidence based on the Sen–Nussbaum approach to welfare. *Social indicators research*, 74(1), 9–55.
- Ansar, A., Flyvbjerg, B., Budzier, A., & Lunn, D. (2014). Should we build more large dams? The actual costs of hydropower megaproject development. *Energy policy*, 69, 43–56.
- Baboo, B. (2009). Politics of Water: The Case of Hirakud Dam in Orissa, India. *International Journal of Sociology and Anthropology*, 1(8), 139–144.
- Baviskar, A. (2004). In the belly of the river: Tribal conflicts over development in the Narmada Valley (2nd ed.). Oxford University Press. (Original work published 1995)
- Chakravartty, Anupam. (2025, May 24) Fresh anti-dam protests rock Arunachal's Adi heartland, with state government offering five crores for consent to survey Siang river, Down To Earth.
- Chhotray, V. (2011). The anti-politics machine in India: State, decentralization and participatory watershed development. Anthem Press.
- D' Souza, R. (2006). Drowned and dammed: Colonial capitalism and flood control in Eastern India. Oxford University Press.
- Dansana, A. (2021). Hirakud Dam and Plight of its Oustees. Engage- *Economic and Political Weekly*, 56(13).
- Del Bene, D., Scheidel, A., & Temper, L. (2018). More dams, more violence? A global analysis on resistances and repression around conflictive dams through co-produced knowledge. *Sustainability science*, 13(3), 617–633.
- Duflo, E., & Pande, R. (2007). Dams. *The Quarterly Journal of Economics*, 122(2), 601–646.
- Ete, Joken. (2026, February 21). Join the development: Sitang village signs MoU for Siang Upper Multipurpose Project; Households to receive Rs. 2.5 lakh for livelihood schemes.
- Fischhoff, B. (2015). The realities of risk-cost-benefit analysis. *Science*, 350(6260), 6516.
- Gadgil, M., & Guha, R. (1995). Ecology and equity: The use and abuse of nature in contemporary India. Routledge.

- Gellert, P. K., & Lynch, B. D. (2003). Mega-projects as displacements. *International Social Science Journal*, 55(175), 15-25.
- Gleick, P. H. (2008). Three Gorges Dam Project, Yangtze River, China. Peter H. Gleick et al., *The World's Water*, 2009, 145-146.
- Government of India. (1951). First Five Year Plan. Planning Commission.
- Haines, D. (2021). Development, citizenship and the Bhakra-Nangal dams in postcolonial India, 1948–1952. *The Historical Journal*. Advance online publication.
- Hamilton, R. E. (1969). Damodar Valley Corporation: India's Experiment With The TVA Model. *Indian Journal of Public Administration*, 15(1), 86-109.
- Hoque, M. M., Islam, A., & Ghosh, S. (2022). Environmental flow in the context of dams and development with special reference to the Damodar Valley Project, India: a review. *Sustainable Water Resources Management*, 8(3), 62.
- Hussain, M. (2008). *Interrogating development: State, displacement and popular resistance in North East India*. Sage Publications.
- Jackson, S., & Sleight, A. C. (2001). The political economy and socio-economic impact of China's Three Gorges dam. *Asian Studies Review*, 25(1), 57-72.
- Jayal, N. G. (2001). The developmental state. In N. G. Jayal (Ed.), *Democracy and the state: Welfare, secularism and development in contemporary India* (pp. 119–164). Oxford University Press.
- Khagram, S. (2004). *Dams and Development: Transnational Struggle for Water and Power*. New York: Cornell University Press.
- Klingensmith, D. (2007). *One valley and a thousand: Dams, nationalism and development*. Oxford University Press.
- Lahiri-Dutt, K. (2003). People, power and rivers: experiences from the Damodar River, India. *Water Nepal*, 9(1), 251-267.
- Lahiri-Dutt, K. (2012). Large dams and changes in an agrarian society: Gendering the impacts of Damodar Valley Corporation in eastern India. *Water Alternatives*, 5(2), 529-542.
- Meher, R. (2011). Big Dam, Big Failures: A Study of the Canal Irrigation System and the Deprived Tail-End Farmers in the Hirakud Command Area of Orissa, India. *Journal of Asian and African Studies*, 46(4), 422-438.
- Menon, M., Vaghlikar, N., Kohli, K., & Fernandes, A. (2003). Large dams in the Northeast. *Ecologist Asia*, 11(1), 4.
- Mukherjee, R. (Ed.). (2007). *Great speeches of modern India*. Random House India.
- Nayak, A.K. (2013). Development, Displacement and Justice in India: Study of Hirakud Dam. *Social Change*, 43(3), 397-419.

- Nehru, J. (1947). *Tryst with destiny speech*. Government of India Publications.
- Nehru, J. (1954). *Speech at the inauguration of Bhakra Nangal Dam*. Publications Division, Government of India.
- Nehru, J. (1954). *Temples of the new age*. In Jawaharlal Nehru's speeches 1953–1957.
- Nehru, J. (2007). *Temples of the new age: Inaugural address at Bhakra-Nangal, 8th July 1954*. In R. Mukherjee (Ed.), *Great speeches of modern India* (pp. 222–226). Random House India. (Original speech delivered 1954)
- Nehru, J. (2007). *Tryst with destiny*. In R. Mukherjee (Ed.), *The great speeches of modern India* (pp. 167–169). Random House India.
- Nehru, J., & Gopal, S. (1974). *Selected Works of Jawaharlal Nehru*. New Delhi: Oxford University Press.
- Nehru, P. J. (1963). *Selected Works of Jawaharlal Nehru: Second Series (Vol. 83)*. Nehru Archive.
- Orueta, F. D., & Fainstein, S. S. (2008). The new mega-projects: genesis and impacts. *International Journal of Urban and Regional Research*, 32(4), 759–767.
- Paranjpye, V. (1990). *High dams on the Narmada: A holistic analysis of the river valley projects*. Indian National Trust for Art and Cultural Heritage. (introduction, chapter 1)
- Raina, V. (2000). Why people oppose dams: environment and culture in subsistence economies. *Inter-Asia Cultural Studies*, 1(1), 145–161.
- Rangachari, R. (2006). *Bhakra Nangal Project: Socio-economic and environmental impacts*. Oxford University Press.
- Rangachari, R. (2006). *Bhakra-Nangal Project: Socio-economic and environmental impacts*. Oxford University Press.
- Roy, A. (1999). *The cost of living*.
- Roy, A. (1999). *The greater common good*. India Book Distributor (Bombay) Ltd.
- Roy, A. (1999). *The Greater Common Good*. Outlook India.
- Roy, A. (2006). The cost of living: The Narmada dam and the Indian state. In L. I. Rudolph & J. K. Jacobsen (Eds.), *Experiencing the state* (pp. 33–99). Oxford University Press.
- Rudolph, L. I., & Jacobsen, J. K. (Eds.). (2006). *Experiencing the state*. Oxford University Press.
- Scott, J. C. (1998). *Seeing like a state: How certain schemes to improve the human condition have failed*. Yale University Press.
- Scott, J. C. (2006). High modernist social engineering: The case of the Tennessee Valley Authority. In L. I. Rudolph & J. K. Jacobsen (Eds.), *Experiencing the state* (pp. 3–32). Oxford University Press.
- Shiva, V. (1991). *The violence of the Green Revolution: Third World agriculture, ecology and politics*. Zed Books.

- Thakkar, H., & Dharmadhikary, S. (2005). Unravelling Bhakra: Assessing the temple of resurgent India. Manthan Adhyayan Kendra.
- Thukral, E. G. (1992). Big dams, displaced people: Rivers of sorrow, rivers of change. Sage Publications.
- Tullos, D. (2009). Assessing the influence of environmental impact assessments on science and policy: An analysis of the Three Gorges Project. *Journal of environmental management*, 90, S208-S223.
- Vora, R. (2009). The world's first anti-dam movement: The Mulshi satyagraha (1920–1924). Permanent Black.
- World Commission on Dams. (2000). Dams and development: A new framework for decision-making. Earthscan.
- Zhao, L. (2023). A policy review on sustainability and the Three Gorges Dam in China. *Studies in Social Science & Humanities*, 2(3), 28–36.