

Whose River Is It Anyway?

Political Economy of Hydropower in the Eastern Himalayas

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The large dams being built on the rivers of the eastern Himalayas have become highly controversial. The hydropower that north-east India is expected to produce is meant almost entirely for use elsewhere. That these dams will be exclusively hydropower and not multipurpose dams and that there will be a great unevenness in the distribution of potential gains and losses – and of vulnerability to risks – accounts for a serious legitimacy deficit in India’s ambitious hydropower development plans in the region. The enclosure of the water commons – the inevitable outcome of these dams – will have a devastating impact on the lives of millions, especially the rural poor who depend on the water commons in multiple ways for their living. What is occurring in the Brahmaputra Valley today is resistance by a riverine people against powerful elites bent on pursuing a strategy of accumulation by dispossession, and trying to turn their rivers into free fuel for hydropower plants, in utter disregard of the impact on their lives and livelihoods.

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There has been increasing talk of Maoists “infiltrating” the protests against large dams in Assam. Chief Minister Tarun Gogoi cites “Intelligence inputs and Home Ministry reports” to support his claim.¹ An internal memo of the Ministry of Home Affairs warns of a “new ‘Red Terror Corridor’ along the Assam-Arunachal border”,² a geographical belt that includes the construction site of the controversial Lower Subansiri hydropower project. The area has been the focus of protests against mega dams on the rivers of the eastern Himalayas. The 2,000 MW Lower Subansiri plant is one of the many hydropower projects planned in the region, and the first of the big ones to move into the construction phase. In 2011, a civil disobedience campaign began blocking trucks carrying building material to the dam site, which brought construction work to a standstill.

India’s political and security establishment has been haunted by the spectre of Maoism for a while. But north-east India has not been part of what is often referred to as the “red corridor”, along which the so-called Maoist strongholds are supposedly located. The region has had its share of political militants. But they are motivated mostly by aspirations of group recognition and political autonomy, and lately they have been on the defensive. To what extent a Maoist movement is taking shape in the region is beyond the scope of this article. Our focus is on the political economy of hydropower development in the region with particular emphasis on the Lower Subansiri project and the controversies surrounding it. The term Maoist, deployed by politicians and security officials in this context, I would suggest, functions as a counteraction frame: a strategic form of “symbolic characterisation employed by oppositions against social movements” (Isaac 2008: 388; Haydu 1999). It carries the odour of un-patriotism, even treason, thanks to Maoism’s Chinese provenance and India’s strained relations with China. Thus when Chief Minister Gogoi spoke of Maoists “infiltrating” the anti-dam protests, he said that “their acts stood to benefit China”.³ “They (protestors) do not wish Assam to develop. Other parties, including Maoists, are involved in the agitation”, said Gogoi in another context.⁴ Indeed, the suggestion that protesters are enemies of (national) development is an important subtext of the Maoist counteraction frame. The debate on Lower Subansiri seems to have entered a new phase: security and intelligence agencies are getting ready to use coercive methods to quell the protests if necessary. In May 2012, security forces arrested many protesters and forcibly

removed barricades and road blocks blocking the transportation of construction material to the dam site.

Legitimacy Deficit

This turn of events underscores the serious legitimacy deficit of India's ambitious hydropower development plans on the rivers of the eastern Himalayas. The great unevenness in the distribution of potential gains and losses – and of vulnerability to risks – has become rather obvious. There is talk of reliable and inexpensive energy attracting industries to north-east India. But the hydropower that will be produced in the Lower Subansiri and other plants is meant almost entirely for use elsewhere, at least in the foreseeable future. Arunachal Pradesh, the “host state”, will be compensated handsomely with royalties from hydropower sales, and a small number of people in the immediate project area, expected to be displaced in a physical sense, will be compensated and rehabilitated. But official impact assessments give almost no attention to the serious threats to the livelihoods of the hundreds and thousands of people who depend on small-scale fishing and subsistence agriculture in the downstream areas of Assam and beyond. Equally controversial are serious geological hazards – seismic and hydrologic – specific to north-east India that will add significantly to the burden imposed on the region. This lopsided distribution of costs, and of vulnerability, accounts for the serious legitimacy deficit in India's hydropower development policy in the eastern Himalayas.

There is a fundamental difference between the hydropower projects of postmillennial India and the multipurpose river valley projects of an earlier period in India's postcolonial history. In the mid-20th century, large multipurpose river valley projects were taken up to develop a river basin region. They were driven by the spirit of decolonisation itself. The “development of rivers”, in Rohan D'Souza's words, had “charged decolonising nations with a new technological mission: the giant quest to transform fluvial powers into national assets – hydro-electricity, navigation, irrigation, and flood control” (D'Souza 2008). Globally speaking, that was a period when states were seeking to defend society against markets, and markets were regulated to promote the general welfare. That period has long passed. Hydropower development in postmillennial India is occurring under profoundly different conditions with “state and markets...in collusion, jointly promoting the commodification of everyday life and the privatisation of all things public” (Burawoy 2005: 154-55).⁵

The multipurpose river basin development projects of the past had used resources generated by hydropower to finance public goods such as flood mitigation, irrigation and navigation (Briscoe 2005: 34) and their focus was the development of a river basin region. By contrast, what is being designed and built these days are almost all single-purpose hydropower dams with power to be produced and sold for a profit by private as well as public sector companies.⁶ “In the Brahmaputra Basin”, writes John Briscoe⁷, “there are large benefits from multipurpose storage projects that are being foregone because power companies are licensed to develop “power-only” projects,

which are typically run-of the river projects⁸ with few flood control or navigation benefits” (ibid). The economics is quite simple: the fuel for hydropower production is moving water; and if society chooses to define property rights in a particular way, the owners of hydropower plants acquire the basic fuel almost free of cost. Given the “free” source of fuel, unlike thermal power plants using coal, oil or natural gas, hydropower plants require huge initial investments, but once they are built, the operational costs are minimal. Hydropower is attractive to India also because of assured security of supply since increasingly the country has had to look for foreign sources of fossil fuel.

The power-only dams planned on the rivers of the eastern Himalayas are fundamentally at odds not only with India's river valley projects of the past, but also with recent authoritative pronouncements on visions of developing north-east India's water resources. One such document is the strategy report entitled *Development and Growth in Northeast India: The Natural Resources, Water, and Environment Nexus* published as recently as June 2007 (World Bank 2007). The World Bank, several ministries and agencies of the Government of India, and the governments of the north-eastern states collaborated on the report “under the overall leadership of the Government of India, Ministry of Development of North-Eastern Region” (ibid: x). The strategy report emphasised the need for “a vision for the development of the Northeast as a whole” since “the huge rivers, which are the lifeblood of the region, cut across several states”. The report articulates a vision of shared benefits for the region combining hydropower generation with goals such as reducing erosion of riverbanks – “providing communities with assurance that investments in industries and infrastructure are sustainable” – and flood mitigation – “saving millions of Assamese farmers from devastating effects on a recurring basis” (ibid: xvii-xviii).

In November 2004, Prime Minister Manmohan Singh proposed the constitution of a “cohesive, autonomous, self-contained entity called the Brahmaputra Valley Authority or the North-East Water Resources Authority to provide effective flood control, generate electricity, provide irrigation facilities, and develop infrastructure”.⁹ The strategy report expressed strong support for this proposal. V V K Rao, one of the water resource experts involved in the preparation of the strategy report, said that such a body “could be the instrument for transforming the region” but for that to happen it would have to be “cohesive, autonomous, self-contained” and have “managerial and financial autonomy, [be] equipped with top-class manpower, and backed by Parliamentary sanction”.¹⁰ However, the idea of such a statutory authority has gone nowhere ostensibly because of the opposition from the Government of Arunachal Pradesh which “gives no weight to flood control and navigation benefits (which would benefit the much larger populations in downstream Assam) and gives high weight to any submergence (which would displace people in Arunachal)” (Briscoe 2005: 34). If such an authority now comes into being, which is unlikely at the moment, it will have no more than a cosmetic function.

Clearly, an autonomous statutory authority with a strategic vision of the development of the Brahmaputra river basin as a whole should have been in place well before any major water resource development project was initiated. But given the perceived urgency of fast-tracking hydropower development, the Indian government has been aggressively pushing power-only dams after giving a rhetorical nod to the need for an authoritative body dedicated to the development of the river basin region as a whole. The results are predictable. As Don Blackmore, former chief executive of the Murray-Darling Basin Commission in Australia, and another expert consultant involved in the strategy report had warned, while an integrated approach could be “truly transformational” for north-east India, the existing institutional arrangements are “simply too weak and fragmented to coherently manage complex river basins which cut across several different Indian States”.¹¹

This short-sighted and potentially disastrous way of fast-tracking hydropower development reflects what Zygmunt Bauman has called the phenomenon of “market pressures... replacing political legislation... as principal agenda setters”. It confirms Bauman’s observation that “a marked tendency in our times is the ongoing separation of power from politics” (Bauman 1999: 74-75).

Hydropower Development and Its Discontents

Environmentalists favour hydropower because it is a low carbon source of energy. Because water is replenished by the earth’s hydrological cycle it is a renewable source of energy. But hydropower development, when it is large-scale, reeks of unsustainability. Large hydropower dams on rivers of the eastern Himalayas are sure to destroy the health of some of the world’s most powerful rivers and their ecosystems. The adverse impact will be huge on the aquatic and terrestrial habitats of numerous plant and wildlife species, and it will have devastating consequences for the livelihood of communities that depend on them. The influential 2000 report of the World Commission of Dams (wcd) concluded that while dams can bring “substantial benefits”, the record of dam building is one of “pervasive and systematic failure to assess the range of potential negative impacts” including the impact on “downstream livelihoods”. The result is the “impoverishment and suffering of millions, giving rise to growing opposition to dams by affected communities worldwide” (wcd 2000: xxx-xxxii).

In order to ensure that dams in future do not impose such heavy social costs, the wcd had proposed guidelines that break away from the notion of dam-building decisions being the exclusive domain of technocrats. The wcd advocated a participatory approach: treating the affected people as active negotiating partners and not as passive victims or beneficiaries (ibid: 206-11). In addition, the report recommended a precautionary approach vis-à-vis decisions about dams: “exercise caution when information is uncertain, unreliable, or inadequate and when the negative impacts of actions on the environment, human livelihoods, or health are potentially irreversible” (ibid: 236-37).

The report was controversial. Activists engaged in the dam debates of the 1990s welcomed it, but dam construction and hydropower industries were unenthusiastic, as were many governments. Technocrats in India’s water resources and power ministries and the public sector National Hydroelectric Power Corporation (NHPC) were among the report’s most vocal critics. As Ramaswamy R Iyer, himself a former secretary of that department, put it, the response of the Indian Ministry of Water Resources was “comprehensively negative... [T]heir comments are expressed in unusually strong language. This is not mere non-acceptance but total denunciation” (Iyer 2001: 2275).

Yet the wcd report was influential enough for many people to believe that mega dams had become a thing of the past. But in the 21st century they have acquired a new lease of life for two reasons: (a) climate change has moved up on the global policy agenda, and the singular attention given to limiting carbon emissions has made hydropower more acceptable; and (b) the liberalisation and globalisation of capital and financial markets has opened up new ways of financing hydropower projects making the World Bank focused campaigns of the 1990s irrelevant. This was not unanticipated. For instance, Patrick McCully, author of the widely read book *Silenced Rivers*, had noted the following in the 2001 edition of his book, given the financial crunch the dam industry was faced with:

The great hope for the industry is that global warming will come to the rescue – that hydropower will be recognised as a ‘climate-friendly’ technology and receive carbon credits as part of the international emissions trading mechanisms under the Kyoto Protocol (McCully 2001: xvii).

In the past one decade, McCully’s comments have proved prescient.

There is by now a rich literature on the environmental impact of large dams on rivers, watersheds and aquatic ecosystems. To a significant extent it has informed the debate on the Lower Subansiri project. However, the discourse of environmentalism is of somewhat limited use when it comes to understanding – and mobilising public opinion on – the impact of large dams in “developing” countries. The vocabulary of environmentalism may circulate globally. But it does not have the same political resonance among the general public in all parts of the world. While the laws of many countries, including India, require some version of Environmental Impact Assessments (EIAs) for major development projects, those legislations are not the result of domestic political pressures, but of a “top-down international process”. Organisations such as the World Bank, the United Nations Environment Programme, and the Organisation for Economic Cooperation and Development (OECD) had provided “neat, standardised packages” of the EIA protocol to be incorporated into national legislations (Hironaka 2002). An EIA therefore means different things in different countries. In India, the scope of EIAs is extremely limited: it is a technical exercise with little scope for input from people affected by a project. Crucial parts of an EIA are done after a project is approved. According to Ramaswamy R Iyer, EIAs have been “notoriously bad in this country and need to be

substantially improved and distanced from the proposers, approvers and implementers of projects".¹² Yet the EIA exercise provides some space for public criticism of projects. However, because of the priority that the EIA process appears to attach to the impact on endangered species rather than on humans, it has been possible for those pushing such projects to argue that only rich countries can afford environmental regulations, poor countries cannot. This has suited the interest of hydropower developers in north-east India and their political supporters exceedingly well.

An older language of political economy can better capture the effects on people. I argue below that the most important result of hydropower development on the rivers of the eastern Himalayas is the "enclosure of the hydro-commons" (Bakker 2003: 338), which will have a devastating impact on the lives of millions – especially the rural poor – who in a variety of ways depend on the water commons for their livelihood.

Great Leap Forward in Hydropower

The failure to meet the demand for electricity has been the bane of India's economic growth story. Insufficient availability of power has substantially contributed to the slowing down of India's economic growth rate. It is estimated that India's power demand will rise by 350% in two decades. That will require that the country triples its power generation capacity (World Bank 2007: 55-56). India is the world's seventh largest emitter of green house gases, and the fifth largest emitter of carbon

dioxide (CO₂) from fossil fuels. Coal-fired thermal plants are by far the most important source of electric power and it contributes the bulk of India's total CO₂ emissions. In global climate change forums, India is under growing pressure to reduce emissions. It has made serious commitments to reduce emissions per unit of gross domestic product (GDP). Therefore, as India invests heavily in power generation, its energy strategy tries to balance between conflicting goals. During the Twelfth Five-Year Plan period of 2012-17 India's target is to add an additional 1,00,000 MW of power generation capacity – an "ecologically impossible" target, said former Minister for Environment Jairam Ramesh.¹³ Of the targeted additional power, 76.5% is expected to be generated by fossil-fuel powered sources, and 20% from hydropower.

Since the turn of the millennium, the intention of policymakers to fast-track hydropower development has been quite apparent. A vision document circulated by the Central Electricity Authority of India (CEA) in 2001 estimated the total cost of harnessing the remaining hydropower potential of the country by 2025-26, and provided preliminary ranking studies of about 400 hydropower dams with the total production capacity of about 1,07,000 MW. In order to interest potential developers, the CEA ranked the projects into five categories – A, B, C, D and E – in terms of feasibility by taking into account logistical as well as political constraints (insofar as they might involve interstate or international river disputes). In May 2003, the then prime minister, Atal Behari Vajpayee, announced the

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50,000 MW initiative that included “pre-feasibility reports” on 162 new projects with an aggregate capacity of 47,930 MW (ADB 2007: 13). Those projects were to be completed by 2017, and were to be followed by another drive to add at least 67,000 MW of additional hydropower capacity in the subsequent 10-year period (International Rivers 2008: 7). This projected pace of dam building and the scale of India’s hydropower development plans is unprecedented, nothing short of an attempt at a great leap forward in hydropower generation.

A significant part of India’s untapped hydropower potential is located in the rivers of the eastern Himalayas. This has been known for a while. But the massive engineering projects necessary to tap into those reserves were not feasible till recently because of the region’s poor communication infrastructure. According to CEA’s estimates, north-east India could generate as much as 58,971 MW of hydropower. Arunachal Pradesh alone has the potential of producing about 50,328 MW of hydropower, the highest in the country (GOI 2004: 37). Government officials now project the state as India’s future power house. A policy document of the state government proclaims that the state could be “floating” on “hydro-dollars”, as oil-producing west Asian countries presumably do on “petro-dollars”, if its hydropower potential is harnessed fully.¹⁴ The expectation of the state’s politicians that the state could make windfall gains from hydropower has facilitated New Delhi’s drive to put hydropower development on the eastern Himalayan rivers on a fast track.

As of October 2010, the Government of Arunachal Pradesh signed memoranda of understanding with developers on 132 hydropower projects with a total capacity of 40,140.5 MW; 120 of them are with private companies (Vagholikar and Das 2010). A news report of September 2011 puts the number of memoranda of understanding signed at 148 (*Down to Earth* 2011). According to one estimate, in a 10-year period, Arunachal Pradesh proposes to add hydropower capacity which “is only a little less than the total hydropower capacity added in the whole country in 60 years of Independence” (Human Rights Law Network 2008: 3). While memoranda of understanding do not automatically translate into actual projects, the rush to draw up such agreements provides a glimpse into the process of fast-tracking hydropower development, in the absence of an autonomous river valley authority with a strategic vision of what is good for the region. Potential developers pay significant sums of money to the Government of Arunachal Pradesh as advance payment “before any public consultations, preparation of detailed project reports and receipt of mandatory clearances” (Vagholikar and Das 2010). An activist of the Human Rights Law Network claims the following:

Private players have made upfront payments to the government, which defeats the purpose of public hearings before beginning the construction of projects...Upfront payment means the project becomes a fait accompli. The entire process under [the] Environment Protection Act of 1986 then becomes a farce since the government is in debt to the developer.¹⁵

Smelling the prospects of windfall profits, private companies have rushed in. Indeed companies “unheard of in [the] power and infrastructure sector” like Mountain Fall India, KSK Electricity

Financing, Indiabull Real Estate, and Raajratna Metal Industries have signed memoranda of agreement with the Arunachal government (Deka 2010: 4). In the case of the 1,750 MW Lower Demwe project on the Lohit river, Athena Energy Ventures has committed more than 15% of free power to the state government as royalty,¹⁶ significantly more than the 12% that the public sector NHPC would have given.

In the rest of this paper, I focus on the two sets of issues that have been central to the controversy on mega dams in Assam over the past few years: dam safety and the impact on downstream livelihoods. But before that, let me first briefly introduce the Lower Subansiri project, and provide an overview of how the controversy has evolved.

The Debate on Lower Subansiri

One of the principal tributaries of the Brahmaputra, the Subansiri is Arunachal Pradesh’s largest river system. After flowing through Tibet and descending down the eastern Himalayas in Arunachal Pradesh the river flows into the Brahmaputra in the plains of Assam. The Lower Subansiri project will harness the hydro potential of the lower reaches of the river. The 116 m high concrete gravity dam under construction is located 2.3 km upstream of Gerukamukh village in the Dhemaji district of Assam.

Protests against the Lower Subansiri project started as soon as the process of granting clearances under India’s environment, forest and wildlife laws began in the early 2000s. Initially, it was primarily the environmental activists who had voiced opposition chiefly on grounds that the dam site and submergence area includes a region known for its rich wildlife and biodiversity. They pointed out serious flaws in the EIA and other project documents submitted for obtaining clearances arguing that they underestimated the project’s potential adverse impact on biodiversity. They raised procedural objections as well (Vagholikar and Ahmed 2003).

But opposition on other grounds also began to form during those early days. An activist was cited in an article published in 2003 saying that “a small group of the downstream affected people have come together to form the Subansiri Bachao Committee [Save Subansiri Committee], but as of now, they have access to very little information”.¹⁷ However, not all opposition came from those who objected to the dam in principle. There was also political mobilisation demanding that jobs, as well as subcontracts for the supply of construction material, go to locals.¹⁸ The protests in Assam gained strength from around 2005, when construction began in earnest, and two influential statewide organisations, the All Assam Students Union (AASU) and the Krishak Mukti Sangram Samiti (KMSS)-led by Akhil Gogoi, who had developed a nationwide reputation as a right to information activist – got involved. Soon the state’s main opposition party, Asom Gana Parishad (AGP), also joined in. The protests now were firmly focused on the issue of dam safety; and on the potential adverse impact on downstream communities, which had received little consideration in the approval process. The uneven distribution of the costs and vulnerability of the project also became an issue. “Arunachal

Pradesh is set to gain revenue from these projects”, an AASU leader was quoted as saying, “but Assam will be the victim if anything goes wrong”.¹⁹

As the anti-dam agitation gained strength, and the April 2011 elections to the state assembly drew close, the Lower Subansiri dam emerged as a major political issue. Apart from the AGP, the Bharatiya Janata Party (BJP) also supported the protests. In July 2009, the Assam Legislative Assembly debated the issue and members of the ruling Congress Party joined opposition Members of the Legislative Assembly (MLAs) in expressing concern about the dam’s potential adverse impact on downstream communities. A critical step in the controversy was the decision in December 2006 to constitute an expert group to study the downstream impact of the dam. It was the result of an agreement between the Assam government, the NHPC and the AASU, which by then was playing a major role in the protests. The expert group was constituted with 8 academics – professors of civil engineering, environmental science, geography, geology, life sciences and zoology – at three of Assam’s most prestigious academic institutions: Gauhati University, Dibrugarh University and the Indian Institute of Technology in Guwahati. The NHPC later indicated that it was a reluctant party to the agreement. It “was constrained to award the study” to this group of academics, says an NHPC statement, and that the composition of the committee was “suggested by AASU” (NHPC 2010a: 33).

The expert group submitted its report in June 2010. It confirmed that the fears expressed about the dam’s safety and adverse impact on downstream communities were not unreasonable. The report recommended that the dam be redesigned: its height reduced and other changes made to increase the river flow and help flood moderation, but changes that would cut into its power producing capacity and profitability. The expert group’s report galvanised the protests in Assam. By then the state’s ruling Congress Party was trying to present itself as sympathetic to the concerns of the protesters. As Chief Minister Tarun Gogoi said, “We are not against dams”, but if the Lower Subansiri leads to “adverse environmental impact then we are not going to accept it”.²⁰ The state government, as one analyst put it, was “in a bind. On the one hand, elections dictate it respect the popular sentiment. On the other hand, it cannot go against the Congress-led government at the Centre which wants dams” (*Down to Earth* 2010).

In the autumn of 2010, the political stakes were high enough for the then environment minister, Jairam Ramesh, to come to Guwahati on 10 September and hold a “public consultation” on the issue of large dams that extended for more than six hours. Activists and intellectuals associated with the protests interacted with the minister. In keeping with an assurance he gave to that audience, Ramesh wrote a letter to the prime minister conveying the sentiments expressed in the meeting. On the Lower Subansiri project, he said in that important letter, “the dominant view in Assam appears to be that this project will have serious downstream impacts” and that they want the “project to be scrapped completely”.

However, he said,

[I have]...made it absolutely clear to the audience that I am in no position to make any commitment on the existing Lower Subansiri which is under implementation...All I promised was that I would convey the sentiments and concerns to the PM and the Union Power Minister.

But in the case of “projects not yet started”, he said that he made an assurance that “we will carry out cumulative environmental impact assessment studies as well as comprehensive biodiversity studies”. Ramesh conveyed his own views on the subject as follows:

Personally, I believe that some of the concerns that were expressed cannot be dismissed lightly. They must be taken on board and every effort made to engage different sections of society in Assam particularly and in other North Eastern states as well. Right now the feeling in vocal sections of Assam’s society particularly appears to be that ‘mainland India’ is exploiting the North-East hydel resources for its benefits, while the cost of this exploitation will be borne by the people of North-East.²¹

Those were heady days for the protests against mega dams. Since then the political environment has changed significantly. The Congress Party scored an impressive victory in the Assam elections of April 2011, and Chief Minister Gogoi was re-elected to power for a third term. In July 2011, Jairam Ramesh was shifted out of the environment and forests ministry, while his rank was elevated to cabinet minister. There was little doubt that Ramesh’s being relatively pro-environmental, and the opposition of powerful industrialists and some of his cabinet colleagues, were behind the decision to change the leadership of the environment and forests ministry.

Even before the elections, the Assam government’s ministers, while maintaining a supportive stance towards the notion of modifying the dam’s design, were careful not to support the protesters’ demand that work on the Lower Subansiri project be suspended. At the same time, they tried to slowly disassociate themselves from the recommendations of the expert group’s report. Nor did they back the protesters’ demand of a moratorium on approval of a new hydropower project till concerns about the downstream impact of large dams are resolved satisfactorily. But by the autumn of 2011, Assam government ministers began saying that the protests were “engineered” by “Left-wing extremists” while at the same time drawing a distinction between “civil society groups” involved in the protests and the “extremists”.²² The government’s attitude towards protesters blocking transportation of construction material to the Lower Subansiri dam site also became confrontational. However, Chief Minister Gogoi has also been speaking of bringing in new experts, including “international” ones, for advice on the matter. Meanwhile, the Indian government has continued to give stamps of approval to other major hydropower projects.

Earthquakes, Floods and the Politics of Risks

Geographers characterise north-east India as a seismically active region where earthquakes impact the hydrologic characteristics and morphology of rivers and water bodies (Goswami 2008). In this region such changes occur not just in the vastness of geological time, but in the time-scale of ordinary humans. Historical sources are replete with references to earthquakes,

including catastrophic ones. The following is an eyewitness account of the Great Assam earthquake on the night of 15 August 1950 that measured 8.7 on the Richter scale:

[T]he main shock lasted five or six minutes. It was certainly of long duration and extreme violence, the motion being vertical, as though the crust of the earth were caving in...The illusion of everything falling down an immeasurable shaft was, of course, heightened by rocks pouring down the mountain sides all round us with a fearful clatter... [T]he vibration was so rapid as to suggest the roll of kettledrums. Dark as it was, we could see the ridges silhouetted against the paler sky, with their fuzzy outline of dancing trees. The noise was terrific, petrifying, and long continued as whole hillsides, studded with pine trees, slid into the valley (Kingdon-Ward 1953: 172).

The account is by English botanist Francis Kingdon-Ward, who while on a “plant-hunting expedition” found himself close to the earthquake’s epicentre in Rima, Tibet. Some of those massive landslides – “solid-looking hills...in the grip of a force which shook them as a terrier shakes a rat” as Kingdon-Ward (1952: 406) put it – blocked the downstream flow of the Dihing, Dibang and Subansiri rivers, tributaries of the Brahmaputra, and when the trapped water burst through in cascades a few days later, it caused catastrophic floods downstream. These are the same rivers on which major hydropower dams are being built or planned today. The earthquake and the floods of 1950 are deeply etched in the collective memory of the people of the Brahmaputra Valley. More than half a century later, villagers in the region remember the floods of 1950 as *pahar bhanga pani* (hill-destroying floodwaters) and *bolia pani* (floodwaters driven by madness) (Das et al 2009: 24).

The river regime of the Brahmaputra changed dramatically as a result of the earthquake of 1950. The phenomenal volume of landslide debris carried downstream raised the riverbed of the Brahmaputra. It went up initially by about 5 ft near the town of Dibrugarh, and as large volumes of debris continued to pour into the river, it rose by another 5 ft by 1955. Ever since, floods in the Brahmaputra Valley have become more frequent and destructive. Over the years, as rivers have changed course and riverbanks have eroded, thousands of acres of productive agricultural land, homes, valuable infrastructure and sometimes entire villages have been lost in Assam. The dykes and embankments built to provide flood protection have been no match to the Brahmaputra’s fury. To this day, the region struggles with the consequences of the 1950 earthquake. Floods have pushed thousands of people to new areas, and in recent years, to more and more vulnerable lands, to forestlands, protected areas, where they are often labelled encroachers. Many have been forced to give up agriculture and have moved to urban areas in search of alternative sources of livelihood.

It is not surprising that till recently, the focus of all policy thinking vis-à-vis rivers in Assam had focused exclusively on the issue of floods. In 1972, the Government of India had constituted the Brahmaputra Board with flood control as its primary mandate. Indeed, a dam on the Subansiri was first envisaged as far back as 1955 under the auspices of what was then the Brahmaputra Flood Control Commission. It was envisioned as a multipurpose project with flood control and irrigation as primary goals. Indeed, investigations on dams on rivers

of the Brahmaputra River basin including the Subansiri under the auspices of the Brahmaputra Flood Control Commission and the Brahmaputra Board were all for multipurpose projects: to provide flood control and irrigation, and also produce hydropower. But none of these plans got off the ground because of resource constraints. Now these plans have all been set aside in favour of single-purpose hydropower dams. In 2000, authority over the Lower Subansiri project was transferred from the Brahmaputra Board to the NHPC in order to make room for the power-only project currently under construction.

Vulnerability to Flooding

To the people of the Brahmaputra Valley, dams in the mountains and foothills that surround it evoke a raw sense of danger and foreboding. Recent disastrous flash floods attributed to water released from two upstream hydropower plants – one in Arunachal Pradesh and the other in Bhutan – have accentuated the sense of vulnerability. There have been no public inquiries about the causes of these floods, nor any assurance that they will not occur again. Furthermore, the districts of Lakhimpur and Dhemaji have seen unprecedented levels of siltation, which locals attribute at least partly to the mining of the beds of the rivers for boulders, cobbles and pebbles for use in the Lower Subansiri Dam, and another major construction project: the bridge over the river Brahmaputra at Bogibeel. Boulders moderate the currents in the rivers, stopping sand from being washed away. The massive removal of boulders loosens the river sand and magnifies siltation. Sand-casting has overwhelmed many villages in the area in the past few years. Many see these developments as harbingers of a calamitous future.

“The selected site for the mega dam of the present dimension”, concluded the expert group on the Lower Subansiri project “was not appropriate in such a geologically and seismologically sensitive location”. From the “geological, tectonic and seismological points of view”, said the report, no mega hydropower project should be built in the “Himalayan foothills, south of the MBT”.²³ The NHPC in its response asserted that “the geological and seismological” aspects of the project were all “thoroughly examined by specialists” during the project approval process. It pointed out that top specialists of government agencies such as the Central Water Commission, the Geological Survey of India, Central Soil and Materials Research Station, and the Central Electricity Authority were involved in the process. The dam’s location was cleared by the Indian government’s “highest authorities”. The seismic parameters of the design were approved by the National Committee on Seismic Design Parameters of River Valley Projects (“the highest level committee” of the Indian government) based on “site-specific seismic design parameter studies” done by experts at the Department of Earthquake Engineering of the Indian Institute of Technology (IIT) in Rourkee (“one of the renowned institutes and has specialisation in this field”). Furthermore, the NHPC pointed out that a number of large dams on the western Himalayas including the Bhakra Dam on the Sutlej River in India and the Mangla Dam on the Jhelum River in Pakistan

have been built in a “similar geological environment” as the Lower Subansiri Dam and that they are “functioning satisfactorily” (NHPC 2010b: 52-53).

Right from the beginning of the controversy, vernacular knowledge based on first-hand experience had presented a formidable challenge to expert knowledge. But the expert group’s report added a new dimension to the controversy: there was now a contest over the authority of two rival bodies of expert knowledge. Whatever the prestige of the technical experts on India’s top-level official agencies, their stamp of approval has failed to carry the day in the Brahmaputra Valley when it comes to the issue of safety of dams in the Himalayas. By contrast, the geologists and civil engineers who teach in some of the region’s best-known academic institutions and are members of the expert group are seen as individuals who have more stakes in the safety of those dams than anyone living in Delhi or Rourkee. In local eyes, the report of the expert group has significant credibility. The comments of an Assamese hydroelectric engineer with a career in building and managing hydropower plants in the region behind him reflects this tension:

The experts from IIT-Rourkee [which has India’s premier Department of Earthquake Engineering] have not seen the earthquake-induced landslides of 1950...when hundreds and thousands of trees floating downstream had nearly covered the Brahmaputra river. They have not seen that extraordinary spectacle. How can they say what a future disaster on the Subansiri might bring? If despite what we know from real life, we get seduced by what experts from Rourkee might say (about dam safety) even God Almighty may not be able to save the people of Assam (Bhattacharyya 2010).

In January 2012, a paid advertisement by NHPC appeared in many newspapers in Assam under the heading “Clearing the Myths by Presenting Facts on Subansiri Lower Hydro Power Project”. The advertisement juxtaposed a number of “myths” against “facts”. The arguments made in the expert group’s report, with the words often lifted from the report itself, were presented as “myths” – perhaps not the best way of showing open-mindedness regarding a contrary view. The first “myth” listed was the expert group’s argument that the site of the dam was inappropriate. The so-called “fact” was as follows:

The siting of the dam at the present location has been cleared by the designated authorities of Government of India, after satisfying themselves with the existing geological, seismological and tectonic setup at the site and adequacy of investigations.

Against the “myth” that “the dam may break” was another “fact”:

NHPC has so far constructed 12 dams in different parts of the Himalayas, all of which are performing satisfactorily. In 36 years of NHPC history, there is no case of distress on any dam (NHPC 2012).

It is unlikely that any public relations strategist was behind this advertisement. Arrogantly asserting the superiority of expert knowledge produced by national experts over knowledge produced by regional experts, and labelling the latter as “myths”, is not the best way of going about trying to bridge the trust gap on the issue of dam safety.

The debate has clearly turned into what Dutch social theorist Annemarie Mol (1999) calls ontological politics. The impasse is a reminder of sociologist Ulrich Beck’s argument

that experts can only presume the “cultural acceptance” of risks; they cannot produce that acceptance (Beck 1999: 58). The people of the Brahmaputra Valley seem to believe that they intuitively understand that there may be unintended risks to these large dams that are incalculable and uninsurable (ibid: 160n). To a significant degree, that feeling seems to be shared by experts and laymen alike. After all, “acceptable risks are ultimately accepted risks”, says Beck (ibid: 58). And risk definition can sometimes boil down to a power game: “some people have a greater capacity to define risks than others” (Beck 2006: 333).

The Enclosure Effect and Downstream Livelihoods

The building of large hydropower dams is bound to lead to the enclosure of the water commons (Bakker 2003), which in a region like north-east India is bound to have a profound impact on the livelihood of riverine communities. In this section I develop the argument with a few examples of the impact on downstream livelihoods. Rivers carry sediments. Indeed, a river, it has been said, “can be considered a body of flowing sediments as much as one of flowing water” (McCully 2001: 107). The blocking of sediment-borne nutrients is sure to negatively impact traditional flood-recession agriculture in the floodplains, which is a major part of Assam’s agriculture.

Second, dams obstruct fish passage and this dramatically impacts the life cycle of many fish species. In Assam, fish is central to the people’s diet and a major source of the caloric intake of poor people. It is hard to imagine fish surviving the power turbines of a hydropower dam. The changes in water temperatures, severe manipulation of water levels to meet the demands of power generation, and the reduction of oxygen levels are not conducive to the migration and spawning habits of fish, and their growth and reproduction cycles. A recent World Bank study calls subsistence fisheries “a vital but largely unquantified economic activity and livelihood component of rural communities and particularly of the poor”. They “provide vital local nutritious food and a safety net for many poor households”. It is not only an important source of nutrition for those who are fishermen in an occupational sense; fishing may be a component of the survival strategies of many rural households with diverse occupations. Yet “because of their variety, dispersion and social complexity, small-scale fisheries are often poorly documented” (World Bank forthcoming). We know from comparative studies of dams that they can have significant effects on fishing “for many hundreds of kilometers downstream” (Adams 2000: 9). There are few places in the world where the cumulative negative impact of dams on flood recession agriculture in the floodplains and subsistence fisheries will be more devastating to the food security of rural communities – especially of the poor – than in north-east India.

The expert group’s report gives significant attention to these effects. The difference between the scope of this assessment and that of the EIA that was part of the official project approval process is quite telling. The “Study area” of the EIA study on the Lower Subansiri project was limited to 7 km upstream and 7 km downstream of the dam site. By contrast, the

expert group, focusing on the downstream impact, surveyed the Subansiri River basin downstream from the dam site quite comprehensively, dividing it into four sectors. It also considered the potential impact on the large numbers of wetlands that interact with the river in multiple ways including migration of various species of fish. The survey found that people in those zones depend on the river in many different ways depending on their distance from the river. Apart from getting water and fish from the river, they harvest fuelwood, sand and pebbles as well; and depend on it for transportation.

The diurnal and seasonal fluctuations in the water level of the river – the diurnal variations necessary to meet the variation of power demand during the day – says the report, “will definitely affect the river ecosystem as well as the ecology of the connecting wetlands. Aquatic fauna and flora, and dolphin population of the Subansiri will be destroyed by the project with its existing design and operational parameters.” The fluctuations of the water level on downstream communities, the report concluded, will impact lives in the downstream areas in many other ways. For instance, it will dramatically affect the transportation infrastructure of country and motor boats that carry people as well as “domesticated animals, crops, thatches, pottery articles, forest products”. The very low flow of the river during the day time in the dry season would restrict the movement of boats, while the sudden release of excess water from the reservoir when the rivers are in spate will make movement treacherous (LSEG Report 2010, Chapter x: 5-10).

The expert group’s report made a number of suggestions for modifying the dam design in order to minimise those adverse impacts on downstream communities. They include provision of fish passes, efforts to improve the replication of natural stream flow by using hydrological data and the “appropriate temperature and oxygenation of water released downstream” (ibid: 10). Such modification of the dam design will significantly add to the cost of the project and make the Lower Subansiri hydropower plant less profitable. Clearly, the expert group has a very different kind of dam in mind – perhaps more consistent with the multipurpose river valley projects of the past – than what India’s present hydropower development policy permits.

The NHPC’s response to those parts of the report was dismissive. Indeed, it took the report’s portrait of the poor conditions of the villagers – with riverbank erosion and floods regularly damaging crops and homes – as evidence that the traditional livelihoods are not worth protecting. The report, it argues, “shows that even without the Project people are already facing hardships in the downstream area”. By contrast, it points at “opportunities” presented by the dam during the construction phase itself to those living closer to the dam site. The statement says:

It has been seen in general that the people residing in the vicinity of the project are benefited in terms of their socio-economic development, infrastructure development, and educational facilities, indirect employment, business opportunities etc (NHPC 2010a: 44).

That the non-viability of flood recession agriculture and the possible disappearance of fish from rivers and wetlands

could only mean starvation for many of our poorer fellow citizens does not seem to occur to our experts drafting such notes at NHPC.

Apart from the changes in the river’s flow regime, the rules of public access to the river will also change radically once a dam is built. There are already examples of this from hydropower plants now in operation. A hydropower plant on the river Ranganadi located at Yazali of Lower Subansiri district of Arunachal Pradesh and managed by the North Eastern Electric Power Corporation (NEEPCO) has been in operation for a decade. Kimin, a small village in Papum Pare district of Arunachal Pradesh, has been at the receiving end of this plant’s water flow regulation regime. A number of times Ranganadi’s waters have been released without warning, and crops have been destroyed and cattle washed away. One person has died. The people of Kimin are now afraid of getting too close to the river, and they do not let their children play on the riverbank. In July 2006, in response to complaints by Kimin’s residents, and the controversies, the Yazali plant’s management issued the following notification:

...[D]uring monsoon...the gates of the Ranganadi Diversion Dam may require opening from time to time...All concerned authorities, village headmen are therefore requested to bring the same to the notice of all villagers...to refrain from going to the river and...also restrict pet animals from moving around the river/reservoir during the monsoon period. The corporation will not take any responsibility for any loss of life of human, pet animals, etc.²⁴

The use of the term “pet animal” to refer to farm animals and livestock probably indicates the gulf that separates the urban middle class world of power plant managers from that of the rural poor. But that apart, the notification is an extraordinary document. Akhil Gogoi spells out its meaning this way. The power companies seem to believe that all through the rainy season when they release water, “those of us living by the riverbank, should be prepared to run like monkeys to the nearest treetop to escape the rising waters” (Gogoi 2011: 192). The spirit of NHPC’s response to the expert group’s concerns in this matter is not unlike that of the notification quoted above. “Regarding the fear for the sudden release of water downstream”, says the NHPC, “people will be duly informed as is practised in every river valley project so that no loss is incurred in human lives and property” (NHPC 2010a: 44).

There is perhaps no better example of what postcolonial theorist Rob Nixon calls the “resource law of inverse proximity” at work – “the closer people live to the resources being ‘developed’ the less likely they are to benefit from that ‘development’” (Nixon 2010: 75). The people living by a river, writes Nixon,

...may belong to the land but, within a Lockean logic of private property, the land doesn’t belong to them. Thus in terms of the right to remain (not to speak of the right to just compensation) they can readily be cast as uninhabitants, residual presences from a pre-capitalist era (ibid: 74).

In this discursive framework their loss of “non-market access to the means of livelihood” (Araghi 2000: 146) becomes inevitable. This is the enclosure effect of hydropower dams. Like

the enclosures of the 18th century, as historian E P Thompson put it, what is at issue is “alternative definitions of property rights” (Thompson 1975: 261). The results, as Karl Polanyi had said, “have appropriately been called a revolution of the rich against the poor...The lords and nobles...were literally robbing the poor of their share in the common” (Polanyi 1980: 35).

Conclusions

Prominent experts on water resources – some of them known for their staunch support of large dams – have expressed astonishment at the Government of India’s political incapacity to put in place a statutory body that has the power, autonomy and professional competence to focus on the development of the Brahmaputra river basin region as a whole. Among them is John Briscoe, whom critics call the World Bank’s “main large dam crusader” (Bosshard 2008). Indeed, in the debate on the Lower Subansiri project, the NHPC itself cites his book *India’s Water Economy: Bracing for a Turbulent Future* to make the argument that the expert group’s study ignores studies showing the “positive impacts of dams” (NHPC 2010a: 43). While Briscoe in that book indeed argues in favour of large water projects, when it comes to the Brahmaputra basin he laments the Indian government’s failure to find “a formula for getting good multi-purpose outcomes”. Briscoe contrasts this to

...many of the world’s most successful river basin development programs – ranging from the legendary Tennessee Valley Authority of the 1930s to the present-day Yangtze Basin development project [that] have relied on hydropower to generate the resources necessary to fund ‘public goods’, such as navigation and flood control.

The Three Gorges Dam on the Yangtze, Briscoe points out, “is operated as a flood control dam, at an opportunity cost of a massive \$1.5 billion a year in foregone power revenues”. Unfortunately, despite there being “a history of successful multipurpose projects in India”, writes Briscoe (Briscoe 2005: 34), “the Government of India now does not have an enabling framework which facilitates the same socially-optimal outcomes”.

What is occurring in the Brahmaputra Valley today is resistance by a riverine people refusing to accept the risk definition of powerful elites bent on pursuing a strategy of accumulation by dispossession (Harvey 2003) and trying to turn their rivers into free fuel for hydropower plants, in utter disregard of the impact on them. Yet it seems unlikely that the protests will stop the construction of the Lower Subansiri Dam, or unravel India’s plan to achieve a great leap forward in hydropower. Far too powerful economic and political forces are arrayed against the protesters. Furthermore, the protests are unlikely to be immune to the sociological logic of all such protests – that public attention does not remain focused on any single issue for very long (Downs 1972).

Multiple factors will determine how the politics of hydropower in the eastern Himalayas play out. The arguments about ecological impact and threats to downstream livelihoods will have to contend with competing arguments about the trade-offs necessary for promoting India’s development. In today’s

India, the appeal of such arguments can hardly be underestimated even in the north-east, especially among the urban middle classes that are relatively insulated from the impact of the enclosure of the water commons. They are willing to latch on to any hopeful sign of the possibility of leaving the conditions of “economic backwardness” and “insurgencies” behind. Moreover, it has become increasingly apparent that dam protesters in future will face more than intellectual arguments on the other side of the barricades. They will have to contend with the coercive apparatus of the state as well.

It is significant that a part of the wcd report which the Indian government had found most pernicious is the idea that “local people settled on the river banks” are stakeholders, and its recommendation that decisions to build dams should be based on their “free, prior and informed consent”. The critique of the report by Indian officials charged that the wcd’s report had made “a dam decision subject to veto power of the local people settled on the river banks”. The stakeholders, it argued, are not only the people living in the river valleys or those directly affected by dams, “people who are to benefit from a project are also to be considered as stakeholder”.²⁵ In this way of thinking the stakeholders in the Lower Subansiri and the other hydropower projects are not only the people living by the rivers in Arunachal Pradesh and Assam, but also potential consumers of hydropower – perhaps anyone connected to the national power grid including the power hungry corporate houses of Delhi or Ghaziabad. The principal implication of the great leap forward in hydropower for north-east India seems quite clear: the region is entering the era of late capitalism in a familiar role – as supplier of a key natural resource to fuel the engines of economic dynamism elsewhere.

It has been said that if the proposed projects materialise, there will be a fundamental transformation of “the landscape, ecology and economy” of the Himalayan region with “far-reaching impacts all the way down to the river deltas” (International Rivers 2008). We are in the very early stages of the process. Without regional and basin-scale cumulative impact assessments, it is impossible to talk precisely about the full ecological or socio-economic impact on the region. But there is particular reticence on the part of the Indian government to engage in such studies. In their absence, estimates of the impact can only be speculative. However, one thing seems quite certain: if the plans are carried out as currently envisaged, the great leap forward in hydropower will play as decisive a role in shaping north-east India’s future as tea, oil and coal did in the 19th century.

A recent assessment of the impact of hydro development in the Mekong River Basin concluded thus

[I]nstead of an economic hydro-boom as anticipated by many, continued dam-building on the Mekong and its tributaries could result in a non-traditional security disaster characterised by severe food shortages, destruction of livelihoods, and large, irregular movements of people.

The study portrays a scenario of “loss of livelihoods, decimation of fisheries, destruction of crops and general human

insecurity”, that “not only threaten the economic growth of continental Southeast Asia, but risk ending the more stable political environment that the region has been witnessing in recent years” (Baker 2012: iv). One cannot rule out hydropower development on the rivers of the eastern Himalayas leading to a similar “non-traditional security disaster”.

Unfortunately, the people of the Brahmaputra Valley may not have any choice but to learn to live with the risks of mega dams. No one ever asked them if they are willing to exchange the hazards of natural disasters for the risks of modern industrialism. Yet what India’s technocratic establishment has concluded is that “acceptable risks” will become inescapable parts of their lives – at least for those who can continue living in their existing villages and make a living. They will have to find the resources within them – culturally and psychologically – to deal with those risks. Their old ways of dealing with pre-industrial hazards will not do. “No matter how large and devastating”, as Ulrich Beck reminds us, they “were ‘strokes of fate’ raining down on mankind from ‘outside’ and attributable to an ‘other’ – gods, demons, or Nature”. What they will be faced with now are not hazards, but risks: the product of human decision-making. For Beck (Beck 1999: 50) risks are different from hazards because they “presume industrial, that is, techno-economic decisions and considerations of utility”.

The people of Brahmaputra Valley have been living with floods since time immemorial. They have been able to deal with flood hazards mostly by watching changes in the colours of the sky, and the conditions of rivers that they know intimately. Villagers told researchers studying flood adaptation in the region that when the sky turns dark with grey and black clouds, they expect rain within a couple of hours. When dark clouds appear on the horizon, and the distant hills become

invisible, they know that it is raining in the hills, and that floodwaters would come. They have even learnt to predict them: in Majgaon, they expect floodwaters three to four hours after the rains in the hills, and six to 12 hours in Matmora; two areas that the research team had studied. The villagers keep a close watch on river conditions, the speed of the currents and wave size. Then they figure out the timing and the intensity of floods, and decide whether to stay in their homes, or prepare to move to higher ground (Das et al 2009: 24).

Once hydropower plants are up and running, this way of predicting floods will become hopelessly old-fashioned, and even dangerous. Floodwaters could rush to their homes and fields even under a clear blue sky. All it would take is for a power plant manager to follow standard operating procedure and decide to release a certain amount of water, though the “people will be duly informed”, the NHPC tries to reassure us (NHPC 2010a: 44). Nor can anyone rule out another disaster in the hills bringing floodwaters driven by madness (*bolia pani*) to the plains. But this time no one will know for sure, whether it is the result of an act of god or an act of man. But were such a disaster to happen, one can be sure that some technocrat will remind people, and I paraphrase Beck, that statements about risks are inherently ambiguous, nothing is established in terms of certainty: they are only calculations of probability. Nothing is ever ruled out. Risk assessments can only say that in the balance of probability certain things are less likely to happen. Thus those who respond to critics of the Lower Subansiri dam today by saying that the risks of a dam failure are near zero, can easily turn around and “bemoan the stupidity of the public tomorrow, after the catastrophe has happened”, for failing to understand the fuzzy calculus of risks (Beck 1994: 9).

NOTES

- 1 “Maoists Formed Body to Oppose Dams: CM”, 13 January 2012, *Assam Tribune*.
- 2 Cited in Sahni (2012).
- 3 “Maoists Formed Body to Oppose Dams: CM”, 13 January 2012, *Assam Tribune*.
- 4 “Dams on Brahmaputra: Team Anna Member on Fast unto Death”, 19 May 2012, Rediff News (<http://www.rediff.com/news/report/dams-on-brahmaputra-team-anna-member-on-fast-unto-death/20120519.htm>).
- 5 Michael Burawoy’s argument (Burawoy 2010) is an extension of Karl Polanyi’s classic argument on *The Great Transformation* (1980). Polanyi wrote on what Burawoy calls the first wave of marketisation in 19th century Britain, marked by the commodification of labour. It led to the countermovement that consisted of reforms such as the recognition of trade unions, reduction of working hours, and child labour laws – the First Great Transformation. The second wave of marketisation began at the end of the 19th century with the expansion of imperialism. It was interrupted by the second world war, but it proceeded with renewed vigour in the 1920s. The countermovement led to the Second Great Transformation which included protections provided by a variety of regimes including fascism, Stalinism, the New Deal, and Social Democracy. The Second Great Transformation also included decolonisation, socialist planned economies, and the developmental state in newly independent countries. Polanyi expected that the countermovement against the second-wave marketisation will be the end of market fundamentalism. However, contrary to his expectations, says Burawoy, since the 1980s “third-wave marketisation is sweeping the earth, with the state no longer a bulwark to market expansion but its agent and partner. The state, either directly or indirectly through the market, takes the offensive against labour and social rights won in previous periods” (Burawoy 2005: 157).
- 6 Of the 147 hydropower projects for which the Arunachal Pradesh government has signed memoranda of agreement with developers only one is for a “multipurpose” project – the 3,000 MW Dibang project is referred to as “multipurpose” because it has a flood moderation component. The rest are all single-purpose hydropower projects.
- 7 Formerly of the World Bank and currently professor of the Practice of Environmental Health and the Practice of Environmental Engineering at Harvard University.
- 8 The term “run-of-the-river” projects can be misleading: it is used to refer to a variety of projects. Arguably, a hydro project is run-of-the-river only when “inflow equals outflow on a real time basis, i.e., if there is no storage or flow modification at all”. By contrast, the large hydro projects in the eastern Himalayas, while they are referred to as “run-of-the-river”, “involve large dams which divert the river waters through long tunnels, before the water is dropped back into the river at a downstream location after passing through a powerhouse. These projects are promoted as being ‘environmentally benign’ as they involve smaller submergences and lesser regulation of water as compared to conventional storage dams” (Vagholikar and Das 2010).
- 9 V V K Rao, “Hydropower in the Northeast: Potential and Harnessing Analysis”, Background Paper No. 6, 2006, p 37. This paper by Rao was commissioned as input to the study that led to the World Bank (2007) strategy report.
- 10 Ibid.
- 11 Don Blackmore, “Management Structures to Lead the Brahmaputra Basin into the 21st Century”, pp 2-3, Background Paper No 10, 2005, commissioned as input to the study that led to the World Bank (2007) strategy report.
- 12 Speech at the Convention on Dams, p 4, 27 February 2012, Guwahati.
- 13 “Jairam Raises Red Flag over Power Projections”, 23 April 2011, *Financial Express*.
- 14 Government of Arunachal Pradesh, “Hydro Electric Power Policy”, p 5 (<http://www.arunachalhydro.org.in/pdf/State%20Mega%20Hydro.pdf>).
- 15 Cited in *Down to Earth* (2011).
- 16 Minutes of the 24th Meeting of the Standing Committee of National Board for Wildlife,

- p 18, 13 December 2011, Government of India, New Delhi (<http://moef.nic.in/downloads/public-information/mom-24-13.12.11.pdf>).
- 17 Cited in Vagholikar and Ahmed (2003: 27).
- 18 "Overcoming the Odds", *Telegraph* (Guwahati), 27 September 2004.
- 19 Cited in *Down to Earth* (2010)
- 20 "Arunachal Mega Dam Creates Political Storm in Assam", *Hindustan Times*, 27 October 2010.
- 21 Jairam Ramesh, Letter to the Prime Minister of India, reprinted in Talukdar and Kalita (2010: 99-100).
- 22 "Assam Govt sees Maoist Hand Behind Anti-dam Protests", 7 October 2011, Rediff News.
- 23 LSEG Report (2010, Chapter x: 10). The MBT or the Main Boundary Fault, a tectonic boundary between the Lesser Himalayas and sub-Himalayas, is located north of the Lower Subansiri dam site.
- 24 Cited in *Down to Earth* (2008).
- 25 M Gopalakrishnan, Detailed Comments on the WCD Report, United Nations Environment Programme, Dams and Development Project (<http://www.unep.org/dams/documents/default.asp?documentid=469>).

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