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TEHRI: A CATASTROPHIC DAM IN THE HIMALAYAS

Peter Bunyard

The following text appeared as an article in *Resurgence* (no. 146, May-June 1991). The author gives a moving account of what the construction of the Tehri dam – which, when completed, will be the highest dam in Asia – will mean for the lives of over 85,000 rural people who will be displaced by its waters. An update gives information on recent developments on this dam, which international protest has succeeded in halting – but for how long?

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The Bhagirathi river flows through the western Himalayas into the Ganges, pushing its waters on through the sacred city of Hardwar with its Hindu temples and down into the plains of Uttar Pradesh. Several thousand metres high, beyond the small town of Tehri, a valley broadens out, its slopes a patchwork of beautifully maintained terraces that carry down to the edge of the river. The fields look green, plush with rice and other crops; here and there a lonely figure encourages a small, compact mountain buffalo to make the tight turns that set up the plough for the return furrow.

Such a scene has all the semblance of time-old tranquillity, barely disturbed by the mad rush of the industrial age. But all that labour, all that industrious care, is soon to be washed away and buried for ever in the waters of the Bhagirathi as they rise behind the 260-metre-high Tehri dam, now in its early stages of construction. A stretch of 45 kilometres will be drowned along the Bhagirathi and 35 kilometres along its tributary, the Bhilanguna, the two rivers meeting each other at Tehri, at the dam itself. The Tehri, when completed, will have the dubious distinction of being the largest dam in the whole of Asia.

Ever since the world's first massive dam, the Hoover, built on the Colorado in the 1930s, engineers, aided and abetted by politicians and planners, have looked for rivers to tame. All that water rushing to waste as it follows the natural incline down to the ocean is too much for modern engineers to bear, when it can be used for generating electricity and water for irrigation. The Himalayas, with their tight valleys and torrential rivers, are seen as a godsend, and the Tehri dam as a means to provide drinking water as well as electricity to Delhi, 200 kilometres to the south. It will also be used to irrigate the lands of the wealthier farmers in the plains, thus sustaining the high yields of the Green Revolution. Some critics claim that the real beneficiaries in Delhi will be those intent on keeping their lawns green and their swimming pools filled.

The planners are not particularly concerned at the loss of land in the Himalayas. Why worry over a couple of Himalayan valleys, with their marginal agriculture, when the plains, given a sure supply of water throughout the year, are not only amenable to mechanization but will yield far more, thus making up for the land drowned beneath the waters of the reservoir?

That, then, is the logic behind moves to shift more than 85,000 people from some twenty-three villages and from the town of Tehri to make way for the reservoir. Those whose homes and land will vanish are entitled to compensation, but, with all claims having to be in prior to the rising of the waters, any who accept compensation will be seen as for the dam rather than against. The planners have therefore put those against the dam in a tricky predicament in which they might be forfeiting their right to compensation.

In recent times dramatic changes have taken place in the rivers flowing down from the high Himalayas. The village of Sirain overlooks the Bhagirathi as it sweeps around the valley on its way to Tehri, a few kilometres upstream. Over the past twenty years, but with growing intensity, the river has gouged out its bed, depositing enormous boulders and silt along its route. The giant water wheels that used to pump water onto the surrounding pastures have now disintegrated, having been left like stranded whales as a result of the river bottom having fallen by several metres from its earlier depth. The river level now fluctuates violently between the monsoon and the dry season, with as much as a 1,000 times difference between the extremes. Compare this with Bhutan, which kept its forests intact and which therefore has only a sevenfold difference in the volume of water passing down the river at the height of the rainy and dry seasons.

As Sunderlal Bahuguna of the Chipko movement said, 'When I was a young man, some fifty years ago, the natural forests covered all the slopes that you now see denuded and barren. The women had no need to go much further than a couple of hundred yards to gather firewood and fodder for the animals, and in those days each village had many more buffaloes and cattle than it can support today.' 'When we saw the forests being systematically logged, we didn't think to protest,' he told me, 'We had no idea how much

their vanishing would affect the rivers and our lives. We did not benefit from the logging; those who did were mainly from outside, but we now realize what a catastrophe it has brought upon us.'

One of the first indications of change came when the springs used for irrigating the wheat and paddy began to dry up and the yields began to drop drastically. Moreover, pasture by the river became increasingly out of reach of the flowing water as the river dwindled and its level fell. The men could no longer live on the produce of the village and the majority left for seasonal work in the cities, leaving their women behind to do the work in the fields. The trees that provided the basket-maker vanished and he too was out of work, as also was the ancient system of bartering rice and other produce with the craftspeople in the village. Instead, money had to be earned, mostly from outside, to try and purchase the goods that the village could no longer provide. Self-sufficiency began to crumble, just like the denuded slopes.

The ecology of the dammed areas, the needs of the local people, and the way their cultures and traditions have grown symbiotically with their surroundings, are all but forgotten in the modern zeal for utilizing every last drop of nature in what amounts to a spurious pursuit of efficiency. Forgotten, too, is the role of the natural forests in conserving soil and making it fertile, in holding back the rainwater and preventing run-off. The attrition and spoliation began decades ago, spurred on after India's independence, when money-making and profiteering became equated with development. One has only to look upward, to the higher slopes of the Himalayan foothills, to see them shorn of trees, raw with the scars of gully erosion, to realize the awful extent of deforestation, for the most part the result of clear-felling for logs.

For millennia the villagers of the Himalayas have revered the evergreen oak forests of the mountains for the fertility of soil and for the fresh water they brought to them. The Vedic legend goes that the Goddess Ganga was a stormy creature who roamed the heavens like a black cloud. Then came a king, Bhagirat, who needed water for the Earth and its creatures. He called on Ganga to come down and follow him, but she threatened to drown the Earth and carry all away in her fury. Then Shiva rose up from the Earth and caused the water tumbling from the heavens to be distributed in a mass of rivulets, their force softened by the hairs on his head.

The oak of the mountains, in particular *Quercus inqana*, which can grow at altitudes of 10,000 feet, is considered to be holy, the very hair of Shiva. Where the oak grows, there water is to be found, the oak being considered the fount of fertility and of life itself. When the oak and juniper forests were still intact, wild game, including leopards, tigers, deer and bears all abounded, but with the trees gone, the water from the monsoons hurtles freely down the slopes, carrying away chunks of hillside and leaving the hills barren and waterless. As if to make the point, in 1987 the heavy monsoons of that year carried away nine bridges in the region of north-east Garwhal in Uttar

Pradesh, sweeping more than twenty-five busloads of pilgrims to their deaths in the torrents below.

The peoples of the Himalayas, right up to recent times, managed to achieve a remarkable balance between the intricate network of terraced fields and the natural forest on the higher slopes and around the watersheds of the rivers. Indeed, the religions of India are concerned never-endingly with the relationship between humans and nature, nature being sanctified in numerous ways. A classic precedent for the fight to save the trees comes from the Bishnoi people of Rajasthan, who, two centuries before, hugged the trees when the king's woodcutters started chopping the forest down so as to make a new palace. After some villagers, predominantly women, had been killed by the king's men, the king was conscience-stricken and ordered his men away. He then decreed that the forest should be given over to the villagers. Today, that forest still stands, a sacred grove, and one of the few green areas left in the whole of Rajasthan.

Like their predecessors and apparently totally unaware of the precedent, the Chipko people have been prepared to sacrifice themselves to save their remaining forests, for, like the Bishnoi, they know full well that without the forests the environment will rapidly degrade and they will not be able to survive for long.

Today, some 7,000 feet up in the Garwhal region, along a valley that runs diagonally into that of the Tehri dam, the villagers, including the school-children, now regularly take part in out-of-doors discussions on the current state of affairs in the hills and the campaign to re-green them. The women are now preventing further annihilation of the forest. One additional benefit has been the dramatic change in their status in Hindu society.

The logging of vast tracts of forest has put intense pressure on the remaining forests, apart from anything else leading to shortages of fodder. Such shortages mean that fewer buffalo can be kept for working the fields, so reducing the area that can be tilled. The reduction in cattle also results in less fertilizer for the crops, which anyway are being starved of water because of a breakdown in the traditional systems of water retention, including small dams and tanks. Such systems have fallen into disuse because of the destruction of forest and changes in run-off patterns and rainfall.

The women do most of the work. In addition to tilling the fields and harvesting the crops, they bring in firewood from the slopes around, carry the water up from the springs, all while raising children and preparing food, which entails the dehusking of rice. In Sirain, Sunderlal's village, to be washed away in six years' time when the Tehri dam fills, many of the men have had to go away to earn a subsistence wage so as to support their women and children in the village. The onus on the women to hold the village together has grown in proportion to the degradation of the environment. Indeed, it is the women who have suffered most from the deforestation. They are the ones who have to walk 5 or more kilometres to get firewood and then back

again with their heavy loads. As Vandana Shiva points out, the situation has now reached breaking point: survival is close to impossible, with no hours left in the day or night to get the basic chores done. Not surprisingly, since the work falls primarily on their shoulders, the women are the ones who have taken the initiative to try and save the forests and even to replant the denuded slopes with useful local trees, including those that would provide fodder and fuelwood. The natural forests traditionally provided food, fodder, fibre, fertilizer and firewood.

Sunderlal has now returned to the village of his fathers to pit himself against the dam and to drown in its reservoir should stupidity prevail. The alternatives to the Tehri dam are obvious to anyone with sensitivity to the environment. For instance, small check dams could be refurbished high up in the slopes to hold back the water in irrigation tanks so that the forest would be coaxed back in areas which have now dried out. Small hydroelectric schemes could be installed to provide power for pumps and electricity for the villages, so helping regenerate the hills.

The construction of dams goes hand in hand with irrigation projects as well as flood control, and more than 2,400 dams with a height of over 30 metres have been built. By 1930 the first concrete dam was built at Mettur, ushering in the age of large dams. By 1950, almost one hundred large dams with reservoirs having a 'culturable command area' exceeding 10,000 hectares had been built in India; the Hirakud and Bhakra-Nangal dams, for instance, becoming the symbols of economic progress, for with their construction came employment, irrigation, flood control and electricity. But then the Machhu dam collapsed in Gujarat, while in 1962 the Panshet and Khadakwasla dams burst in Maharashtra. In fact, forty dams collapsed or failed between 1874 and 1974, giving India a record of 9.2 per cent dam failures compared to a world average of 5.9 per cent.

Big dams are not solving India's water problems; on the contrary, they mop up resources that would be far more effectively spent on rehabilitating degraded lands and on trying to make effective use of the water that to date is lost from the irrigation channels. Indeed, the misguided obsession with prestigious projects such as large dams is missing the point that denuded lands urgently need rehabilitation. In 1972 the annual loss of topsoil in India was put at 6,000 million tonnes. Less than twenty years later, those soil losses were believed to have doubled through poor land management. At the very minimum, annual run-off losses are likely to be 10 per cent of total annual precipitation, those losses being equivalent to as much as 35 million hectare metres.

The irony, given all the disturbing facts on the rate of degradation of the Indian subcontinent, is that the very resource that India has in abundance is subject to abuse and mistreatment. The villagers, who still make up 80 per cent of the Indian population, have the knowledge and wisdom to rehabilitate the lands that the government has taken over and ruined. Equally important,

they have the determination and enthusiasm to bring life back to the hills. Given the state of the Himalayan slopes, the threats to move people to make way for dams of dubious value and potentially of great danger, such as the Tehri, must be seen as acts of criminality against both humans and the environment. Furthermore, there is evidence, admittedly circumstantial, that in regions where the environment is still reasonably intact and where villagers can continue to subsist in traditional ways, the rate of population growth is relatively low. That does not mean that technological improvements have no place; on the contrary, if properly focused and adapted to real needs they can be of great service. The message is clear: give people security in land use, give them the means to prevent their lands from becoming degraded through conserving forests and watersheds, and the population problem may begin to vanish. But continue on the path of unrestrained exploitation and the problems will abound, whether in the countryside or in the towns. The big dams, so beloved of engineers and politicians, should not even be low on the list of priorities; they should never be allowed to leave the drawing boards.

UPDATE

Since this article appeared, nearly six years ago, in the magazine *Resurgence* (UK), the controversy around the Tehri dam has continued to hit national and international headlines, thanks largely to the fasts of Sunderlal Bahuguna, as well as other well-known activists like Vandana Shiva, who has defended Bahuguna from accusations of being an environmental terrorist, levelled at him by the powerful interests that are pressing for the dam to be completed. Vandana declared that the Tehri dam was 'a totally illegitimate project on several counts', going on to say that 'Neither Bahuguna, nor any of those he has inspired, deserves the label of environmental terrorist. That label belongs to those who are responsible for crimes against nature – to contractors and to the politicians, engineers and administrators they manage to corrupt.'

A few months after Peter Bunyard's article was published, in October 1991, an earthquake (6.6 on the Richter scale) devastated the area on both sides of the dam. There was a public outcry, and a mass of scientific evidence was cited to prove that it was extremely dangerous to build the high dam at Tehri, while the claimed benefits were being grossly exaggerated. The local people, who had been apprehensive for nearly two decades about the consequences of the dam and who had made numerous but unsuccessful efforts to stop its construction, decided to take action once again in 1992. They effectively managed to stop the work of the earthmovers – and were jailed for their pains. In protest, Mr Bahuguna went on an indefinite fast, which was only broken on the 45th day when Prime Minister P.V. Narasimha Rao assured him that there would be a review of the dam. (As a consequence of a previous review, published in 1988, the Ministry of Environment and Forests

recommended that the project be abandoned despite the enormous sums that had already been spent on it.) The promised review was never carried out and after two years the bulldozers and trucks were on the move again.

In May 1996 Sunderlal Bahuguna started a second fast, which was finally broken on the 49th day in the presence of Prime Minister H.D. Deve Gowda, who promised to have the dam reviewed by a committee of four experts nominated by Sunderlal. The *Hindustan Times*, in reporting the event, quoted Bahuguna as saying:

I am a humble son of the Himalayas. We are all Mahatma Gandhi's soldiers and should spread his word. I live in a small village with my wife and do not ask for much from life. My main concern is for saving the environment and giving our children a pollution-free, ecologically balanced world. The Prime Minister has taken the right decision to review the Tehri Dam project, as thousands of lives depend on it.

Another excellent article on the Tehri dam was published by *The Ecologist*, also in 1991 (vol. 21, no. 3, May-June). Its author, Fred Pearce, concluded:

The Gandhian tradition in India, exemplified by Bahuguna, will always be implacably opposed to vast projects such as the Tehri dam. Its case does not rest on seismology, still less on cost-benefit analysis, but on an entirely different philosophy from the mainstream about economic and social development and the relationship between humans and the natural world. But the economic and seismological uncertainties surrounding Tehri have now grown so great that even the state technocrats, the inheritors of the traditions of Gandhi's successor, Nehru, who famously called large dams 'the temples of modern India', may want to call a halt. They may, to cover their retreat, invoke the sanctity of science, of the sacred Ganga or of the balance sheet. But for the majority of the people of the Bhagirathi valley it matters only that the dam be halted.

However, according to a FIAN International Update (11 July 1996), it is all too possible that the recent promises may turn out as vain as the previous ones and that work on the main dam structures will be continued as soon as the public pressure is off and the real environmental terrorists return to pressing their interests – helped, of course, by institutions like the World Bank, which has firmly declared that many countries still need big dams. To help sell this questionable view, which is being contested all over the world, the World Bank affirms that a billion or more people lack sewage systems and piped potable water – and that this causes the deaths of two to three million infants a year. Ergo, who is against big dams is against children!

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THE DEVELOPMENT GAME

Leonard Frank

The following text originally appeared in *Granta* 20, 'In Trouble Again: A Special Issue of Travel Writing', Winter 1986. It is written under a pseudonym.

Development, as in Third World Development, is a debauched word, a whore of a word. Its users can't look you in the eye. Among biologists, the word means progress, the realization of an innate potential. The word is good, incontestable, a cause for celebration. In the mouths of politicians, economists and development experts like myself, it claims the same approval, but means nothing. There are no genes governing the shape of human society. No one can say of a society, as a gardener can of a flower, that it has become what it should be. It is an empty word which can be filled by any user to conceal any hidden intention, a Trojan horse of a word. It implies that what is done to people by those more powerful than themselves is their fate, their potential, their fault. A useful word, a bland word, a wicked word, a whore of a word. Development in the mouths of Americans has a lot in common with psychotherapy in the mouths of Russians.

No. This is nonsense. There is nothing sinister about 'development'. It is simply a useful word to describe the achievement of desirable goals: higher incomes, better nutrition and so on. There are no serious disagreements about what is desirable, and by repeated use the word has achieved a validity of shared understanding. That is all.

I'm happy. I'm alone. I am sitting on a balcony with my feet up, perfectly relaxed. My left arm grills in the sun; my right, in the shade, is still cold from the night. Up here, there is not enough air to filter the light from the sun nor enough to store its heat. I am crossed by a sharp diagonal shadow, happily divided. On a low table by my elbow is a pot of green tea, brought to me by a slavish servant. Next to it are papers and an unopened report. Beyond this rest-house are mountains: mountainsides, mountain valleys, mountain peaks, snow, high passes, the Himalayas, the roof of the world.

There are few perfect moments for a man like me, and now I shiver at the perfect moment. I am here, but not here. I am suspended between these mountain tops. I have arrived, but no one knows I have arrived. The officials