REMEMBERING THE DVC DREAM: OF NATIONHOOD AND DEVELOPMENT VISIONS

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THE FLOOD OF 1943

Kanangopal Bagchi describing the flood of 1943 writes:

In July 1943, when the Second World War was in full swing, Calcutta was the headquarters of the supply base for the Southeast Asian command of the allied nations. The Damodar Valley had experienced continuous rains for four days and the accumulated run–off caused a breach in the northern embankment around Amitupur village in Burdwan district. The escaping water shot forward as a jet, undermining the two embankments bordering the Eden canal on the way, drilled through the Grand Trunk Road and rammed against the Eastern Railway lines, melting the earthen embankments on which the railway tracks stood. The fury of the floods abated shortly afterwards, but the water that escaped the river stagnated over fields and surrounded the dwellings; sand spread over cultivated fields and the flood water dug into the mud plinths of walls leading to the collapse of houses.' Along with these damages there was also breakdown of all communication. Thus the hardship to which the people were exposed provided a fresh momentum for agitation at a time when the people of India were in the midst of a campaign for freedom from the British yoke.[1]

The flood of 1943 was a landscape-altering event for the Damodar Valley tract. In response to the catastrophe of the flood, a slow logical idea was established around the construction of the Damodar Valley Corporation (DVC) that would change the economy and the environment of the region permanently. The DVC project was an important symbol of development, an experiment which was thought up in 1944, planned and institutionalised by 1948, and implemented post-Independence.

Immediately after the dam was constructed, several local protests erupted around the issue of uncompensated displacement and unkept promises. These voices of protest have continued since 1953. By the 1960s, it was popularly proclaimed by peoples movements with the slogan:

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'Damodar not just the sorrow of Bengal but Bihar too' or '*Bihar Dooba, lekin Bangal Ubra Nahi'* (Bihar drowned but Bengal did not benefit). People in the affected areas had witnessed displacement in the upper tract and those in the lower tract faced recurrent floods—thus, pointing towards a suggestion that there may have been a united agreement between the beneficiary and the affected communities about the lost promises of the project.

Other issues raised in the upper tract were the problems of drought and irrigation in the 1980s, and the biased interest of the multipurpose DVC project towards power generation.[2] Later movements in the 1990s in Dhanbad in the upper tract of the Damodar were mobilisations around pollution and unequal distribution of water resources.[3] While each of these demands had their own location politics, the issues were always politically volatile, easily mobilising local residents around them. A common sentiment that was also propagated in Jharkhand (erstwhile Bihar and the upper tract) was that the people had given up their lands for Bengal's sorrow. But located in Bengal in pockets was a dissent on the DVC as well. This paper traces the debates and conflicts around the establishment of the DVC to locate patterns or histories in the ideation and conflict around large dam projects in the country.

HOW THE DAMODAR BECAME A RIVER OF SORROW

It is only in the 18th century that the Damodar was infamously called 'the river of sorrow'. The first recorded flood was in 1730 when the Damodar was shifting its course southwards away from its original mouth at *Naya Sarai* or *Kansona Khal*. The mention of 'Kansona Khal' makes it evident that there had been considerable human intervention in channelling the river waters for agriculture earlier. Studies, by Willcocks for instance, state that these embankments were evidence of a neatly crafted system of managing floods by traditional agriculturalists. Some reports say that these *khals* (canals) fell into utter ruin after the Maratha raids, since the farmers and peasants experiencing huge losses could not afford to maintain them. After the entry of the British administration system, the maintenance of irrigation systems were transferred from the hands of the peasants to the British Army, (and later the Irrigation Department) a system similar to what was being pursued in England by the British Government.

The lower tract of the Damodar being agricultural land (located on the Bengal side), right up to the mouth of the river, there were embankments on either side. However, these embankments could not always contain the fury of the river. As a palliative, the British Government in 1855, decided that the right side embankments be removed for a stretch

of 30 km so that the waters are allowed to spill over and the left side embankments be raised to protect the 'vital interests' of the East Indian Railway, the Grand Trunk Road and the Calcutta Port.[4] Several investigations were made every time floods hit these parts. Was there a possibility of engineering flood control? With each recurring flood, the plans proposed for dams and reservoirs became more expensive, and the costs involved were far higher in comparison to the benefits.[5]

Eighteen years later, in 1913, a disastrous flood destroyed the right side embankment and raised a public outcry. However, it was only when a moderate flood, half the size of 1913, breached the left embankments in 1943, that the British Government was shocked and alarmed. The 1943 flood occurred during a critical period of the Second World War, when the British were fighting the Japanese in Burma (Myanmar). The floods blocked off all lines of communication. This was also a period of famine in Bengal. Thus, in 1944, the Bengal Government urgently formed a committee called the Damodar Flood Enquiry Committee which would finally proposition the construction of the Damodar Valley Corporation project. The Committee comprised of the King of Bardhamman and Meghnad Saha among others. It is from here onwards that the plans for the DVC began to take shape.

SCIENTISTS, THE EMERGING NATION AND THE DVC DREAM

The DVC dream may be situated within the scientific imaginations of the nation-state in the 1940s. Several Indian scientists either trained abroad or homegrown, began to emphasize 'science' and 'industry' as a necessary and important part of independent nation-building. Scientists like P.C. Mahalanobis, M.N. Saha, S.S. Bhatnagar and Homi Bhabha, through the National Planning Committee, further enhanced the role that science would need to play within industry. Meghnad Saha was one among them who was considered to be a key proponent of multi-purpose river valley projects in India.

MEGHNAD SAHA: THE SCIENTIST AND HIS INFLUENCE

Born on October 6, 1893, in the village of Seoratali in the district of Dacca, now in Bangladesh, Saha was the fifth child of his parents who depended on a meagre income from a petty shop-keeping business. Saha's early education, beset with many hardships, was funded by a local medical practitioner Ananta Kummar Das. In his later years, he received a scholarship in the Government Collegiate School, Dacca, where he was expelled for participating in a boycott protesting the visit of the Bengal Governor to

his school in 1905, during the partition of Bengal. He continued his education in a private-run school and later stood first among all the East Bengal candidates at the Entrance Examination of the Calcutta University. He joined Presidency College, Calcutta, with a major in Mathematics and Applied Mathematics where his contemporaries included eminent scientists such as N.R. Sen, J.B. Mukherjee, J.C. Ghosh, P.C. Mahalanobis and J.C. Bose among others. He received the second position in the Examinations in Bachelor of Science, while S.N. Bose was awarded the first position in 1915. Saha and S.N. Bose continued as lecturers in Mathematics in the University College of Science under the leadership of the Vice-Chancellor, Ashutosh Mukherjee. It was here that both Saha and S.N. Bose, finding it difficult to work under the Mathematics professor, shifted to the Department of Physics, while C.V. Raman joined the Department later. Here, Saha, who had pursued Physics only in his undergraduation, worked ardently on the theory of relativity, writing profusely about his findings and experiments in journals and making major contributions specifically in the area of astrophysics. In 1919, Saha was awarded the Premchand Roychand Scholarship of the Calcutta University, and this made it possible for him to spend two years in Europe. He first went to London and spent about five months in the laboratory of Professor A. Fowler. Later, he moved to W. Nernst's laboratory in Berlin, and did some experimental work on the conductivity of heated caesium vapour to seek an experimental verification of the theory of thermal ionization. Saha is best known for his contribution made to the theory of thermal ionization and its application to the interpretation of stellar spectra in terms of the physical conditions prevailing in the stellar atmospheres[6]. On his return to India, Saha worked for fifteen years in the Department of Physics at the University of Allahabad, making it one of the major centres of research activity during those years. He returned to Calcutta in 1938 as a Palit Professor of Physics replacing C.V. Raman who returned to Bangalore as a Director of Indian Institute of Science. It was during this time that Saha spent substantial time on resolving the problems of refugees from East Pakistan, writing about floods and river planning. He had instituted the Indian Institute for Nuclear Physics and was ardently arguing for River Research Laboratories in the region. He was also made a formal member of the Damodar Flood Enquiry Committee where he argued for the adoption of the DVC project along the Tennessee Valley Model. Besides being part of important institutional bodies such as the National Planning Committee, where he was part of the sub-committees working on industry, river planning and irrigation, Saha also became an independent candidate and Member of Parliament from Calcutta.

The different biographical accounts on Saha and his own writings

reflect Saha to be a many-sided individual—a scientist, dissenter, an enthusiast in proposing some of the key industrial and river valley projects, a flood relief worker, proponent of Western sciences, supportive of native scientists, suspicious of private industry and foreign expertise, a believer in science for social justice, who had a scathing critique of the caste system. Being from an underprivileged background himself, it was his scientific abilities that helped him to strive forward. Some scholars say that it is thus no wonder that Saha had so much faith in Science. Besides Saha's scientific achievements, Saha was also keenly interested in river planning, development, and taking science to the public. Thus one finds copious notes written by Saha around the D.V.C, the problems of Indian rivers and river planning in his articles in Science and Culture published and designed for the purpose of public dissemination.

SAHA AND THE DVC

Saha had a personal experience of some of the catastrophic floods in the Damodar Valley area in Bengal and he often took active part in relief measures. As a General President of the 21st Annual Session of the Indian Science Congress Association held in Bombay in January 1934, he drew pointed attention to the serious problem of recurring disastrous flood prior to his appointment in the Committee in 1944. Saha was also part of the sub-committee on irrigation and research under the National Planning Committee (NPC). Saha's ideas on river planning and the DVC found in *Volume 2 of his Collected Works*, in *Modern Review* and *Science and Culture* edited by Santimay Chatterjee gives some inkling of how Saha through the perspective of science was propagating a whole new way of perceiving human-nature relationships, religion, science, society and the future of the industry.

Saha's opinions and arguments that built up the case for the development of the Damodar Valley Corporation may be arranged around his initial reactions to flooding as a relief worker; this led him to the realisation that floods are not 'natural catastrophes' but man-made resulting from the unplanned construction of civil works; after which he becomes an ardent propagator of the DVC as a solution to local as well as bigger national problems and finally to his emergence as a dissenter due to his disgust as a Parliamentarian that the DVC project is not being followed as planned due to corrupt practices. Though one sees in Saha's motivations the primary need to be a good social citizen his solutions are mostly technocratic in the approach to problems. One may logically trace how he builds an argument for the DVC through his articles over the years.

FLOODS: THE HAND OF MAN

During Saha's direct experience of floods in the Damodar, he explains that floods are not the 'freakish events of nature' or 'the Act of God' as propagated by the then British-led state, but in fact 'the Hand of Man.' Thus, in his understanding of the causes of the flood in North Bengal in 1922 for instance, he states:

> *I approached the problem with an impartial mind and I find the conclusion irresistible that "the Hand of Man" must have a fairly large share of the blame. To put the matter in a nutshell, my considered opinion is that if the railways were provided with sufficient waterways, the loss of crops would have been slight, and the destruction of houses and property would have been greatly reduced*. (emphasis mine)[8]

Though Saha agrees on the beneficial qualities of a normal flood, he tracks different incidents of 'catastrophic floods' and highlights in these catastrophes the unique situations which produced them. These reasons mainly centre around poor construction of waterways on the railway lines, and the railway lines acting as embankments with limited breaches. Saha blames the recurring Damodar floods on the erection of bunds and canals to safeguard the East Indian Railway, and agrees with the observations made by Willcocks who gave three reasons for the occurrence of floods, the railway lines themselves acted as embankments, the embankments on one side running parallel to the railway line was made extra strong, and other parallel embankments such as the Eden Canal and District Board roads created the problem.[9] Willcocks observes that, 'the British Government made marking breaches in the embankments which was needed for irrigating the fields a criminal act. Thus while a safe highway for trade to Calcutta was maintained this was done at a terrible cost to people living in Burdwan division'.[10]

In most of these flood situations, Saha concludes that the piecemeal building of bridges, railways and embankments have resulted in natural floods becoming catastrophic. Thus, there is a need to look closely at the natural hydraulics of rivers in the Ganga-Brahmaputra systems which are dynamic. Negligence in this aspect has led to a late response to the devastation that the rivers have brought in. He advocates, thus, for better river planning, river research laboratories and periodic hydrographic surveys.

In a detailed article entitled "Flood" in *Science and Culture* in 1943, Saha elaborates four significant economic interests around the Damodar: the damages to the rural population residing in Burdwan, Hooghly, and parts of Howrah and Midnapore; the railway interests which are the arterial railway lines connecting the city line with Upper India which are constantly breached; the interests of coal miners in the Upper Damodar valley; and

the threatened existence of the city of Calcutta due to the diversion of Damodar to the east and excessive discharge of water into the Hooghly lying to the north of the city, which thus calls for immediate action on the floods.[11] There is no mention of the agrarian communities in Chhotanagpore; the primary interest is around coal in the upper tract and the benefit of agriculturalists in Burdwan, Hooghly, and parts of Howrah and Midnapore.

After highlighting these significant interests, Saha advocates for the recommendations made by Messrs Glass and Adam Williams in 1920, who recommended the construction of reservoir dams in the upper tracts of the river though the plan was obstructed by coal magnates operating in the area earlier, who suspected that the water may percolate and damage their mines. Saha debunks these claims and sings the virtues of the Aswan Dam over the Nile and the possibilities of triple cropping that the dam opened up in Egypt and continues to advocate that the Government must adopt radical measures to solve the problem. Thus, 1943 onwards, we can see Saha slowly begins the propagation of the DVC multi-purpose project as a solution to the problem.

ARGUING FOR DVC: THE TEMPLE OF MODERN INDIA

Through the DVC project, Saha wanted to meet the ends of large-scale industrialisation and better manipulation of natural resources in India. Each of Saha's recommendations after flood incidents finally builds towards the DVC as a solution in his essays. His initial concerns start with countering the monetary losses due to floods, providing better irrigation research and planning for better 'manipulation of water resources', institution of hydraulic research laboratories to correct river planning and exploring capacities for reservoirs in upland tracts to store excess water of the Damodar, institution of a river physics laboratory to understand the changing course of rivers and countering the possibilities of cities such as Calcutta disappearing due to flood.

However, later his recommendations transformed into proposals for new pathways to development. These broadly include the introduction of 'perennial irrigation' and, hence, reduced monsoon dependency in agriculture, viewing rivers as convenient and cheap alternatives for transportation, and as providers of electrical power and efficient use of India's natural resources towards its industrialisation. Thus, the idea of the multi-purpose dam, which would ensure flood control, provide irrigation, navigation facilities and electrical power begins to seem an attractive scheme given the typical concerns of the young nation state in Saha's time.[12]

By reorienting some myths Saha builds a rationale for the DVC project. Saha counters the myth in the official version which states that floods are because of excess rainfall. This official version he feels takes away from the real causes of the incorrect construction of railway lines in the area.[13] However, interestingly it is to this very excessive rainfall that Saha uses as an excuse to counter the argument that afforestation may help prevent floods due to excess rainfall. Here Saha cites a study on the TVA (Tennessee Valley Authority) which highlighted that deforestation helped to prevent floods.[14] Saha refers to Glass's observation of the 1913 floods explaining that due to excessive rainfall and weeks of precipitation it is not possible for the soft soil to hold and, hence, the 'resistance offered by sea, dykes or terracing' may give way and can never prevent a catastrophic flood.[15]

Saha explains that 'India being an agrarian nation' was a convenient myth placed by the colonisers who preferred to access raw materials and keep the Indian population as slaves and peasants. The import of cheap factory goods for the masses, from England resulted in the industrial workers such as the blacksmiths, cobblers, artisans, metal workers in losing their jobs. Distressed with the loss of occupation, they took to agriculture resulting in majority of the population becoming peasantised.[16] Saha calls for modernisation in agriculture with perennial irrigation and promotes industrial activity to absorb more workers and improve the standard of living.[17] Obviously, the DVC multipurpose project is part of this larger dream to booster industrial activity in the region.

The DVC dream, like other dams in the country, was projected as a 'temple of modern India' and though this is often credited to Nehru, Saha's debates on Science and Hindu religion explain why the project got this popular adage attached to it as well. His positions on the need to infuse a scientific temperament within indigenous traditions comes across in a debate that Saha had with Anilbaran Roy on Science and the Hindu religion in 1939, Saha argues for scientific thinking as opposed to dogmatic religious worldviews— 'We cannot build modern-day spirituality on the experience of the human character, historical wisdom and world phenomena in ancient scriptures' he states. To him spiritualism of a modern kind based on scientific attitude could be established.

PLANNING AND INDUSTRY

Saha focuses on the wealth of natural resources that India has which places it at par with several developed countries and suggests the energy index to be *the* index for development rather than national incomes or per capita income focused on commodity production.

Saha draws on examples from Sweden, the US and Russia to establish

how national planning can be usefully and scientifically conducted. According to him, planning does not need to be political or follow any 'ism' but needs to be scientific and well thought out. He is frustrated with the way politicians were envisaging industrialisation. For him, the process of industrialisation is not about setting up 'matchstick industries and spinning wheels' (referring indirectly to Gandhi's views). Instead, he believes that the state should set up some 'mother industries' which include coal, power supply, production of metals, chemicals, etc. In 1938, he supported Netaji Subhash Chandra Bose, President of Indian National Congress, on the idea and criticized some Industries Ministers in Congress Provinces for their myopic insights on industrialisation. He states:

> To use a metaphor, the ministers are not attending to the root and stem of the tree but to the foliage. They forget that if the root is properly watered, the foliage will take care of itself. But at the present times, the Government exercise no substantial control over these key (or another) industries and have allowed them to fall under private hands. At any moment these small scale industries may be killed by corporations which control the mother industries.[18]

Praising Russia's enormous steps in development in comparison to Poland, Saha states that the difference in *"Russia's pace in development 'lies in the fact that Russia has been inspired by a new philosophy of life, a will to conquer nature, and has been able to evolve practical plans to put ideas into practice."*[19] This probably puts the final picture to what Saha was viewing as human-nature relationships, though later in the article Saha acknowledges the evils in the modern capitalistic cum scientific world and the dual role that science can play and hence agreeing to some extent with Gandhi here:

> The evils have arisen, because man gained considerable control over forces of nature, before he has gained moral control over his own self. The developing miracle of science is at our disposal to use or to abuse. But what should not be forgotten is the fundamental fact, that if popular leaders and popular governments are as intelligent and farsighted as Mr. Bose, if business men are more disinterested, and if we all work for social welfare and social justice, we can, with the aid of science, enter into an era of plenty and prosperity; where every man and woman in India can live in comfort…[20]

Located within this scientific temperament are also his views on the 'medieval mind' and caste. In his criticism of the education system, he states that the faulty education system actually seeks to perpetuate the 'medieval mind' which fosters 'competitive communalism' within India and 'competitive nationalism' in the free countries. Infusion of scientific temperaments may help to combat medieval mind and there needs to be a greater dissemination of the advancement of science for a wide public to inculcate the scientific temperament in the country in his opinion.

Caste is an impediment to development for him. In his exchange

with Anilbaran Roy on Science and the Hindu Religion, he states:

"For ages India has not produced any new process in weaving, ploughing, architecture, metallurgy and warfare. The reason is we have always looked down upon using the hand. Thinking was meant to be superior hence the hand and the head have lost all connection."

Thus, in Saha's views on development is this heady mix and promise of 'social justice' and 'plenty for all' which may be answered only through proper natural resource exploitation, heavy industrialisation and scientific revolution.

DISSENT ON THE DREAM

Nehru and other scientists were in agreement with Saha's views on industry and science. It is only in the 1950s that Saha's views start to diverge with Nehru and other scientists such as Bhabha where Saha feels that private interests should be kept out of planning exercises and scientific endeavours. However, the only national dissenter amidst the optimism that ruled in the 1940s and amidst this scientific unity in thought was Gandhi. While he warns Nehru about the 'evils of industrialism' stating that industrialism is inherently capitalist and these evils may not change by socialising industrialism. Gandhi also raises an insightful ecological dilemma in his opposition to large scaled industry which is often quoted from Young India as:

"God forbid that India should ever take to industrialism after the manner of the West. The economic imperialism of a single tiny island kingdom (England) is today keeping the world in chains. If an entire nation of 300 million took to similar economic exploitation, it would strip the world bare like locusts.'[21]

A REBEL ENGINEER

Though there were these larger debates on industrialisation and later protests emerged as reactions to the impacts of the dam, unlike large hydropower projects today, there was little public dissent on the DVC when it was planned. Among the minority of voices to be found opposing the project in India was Kapil Bhattacharjee. Ashis Nandy carries a detailed commentary on Kapil Bhattacharjee which traces Bhattacharjee's troublesome life and the 'hostile milieu' within which he had to survive for having critiqued the dam in an atmosphere of great optimism.[22]

Bhattacharjee, born in a lower middle class Brahmin family in Hooghly district, spent a considerable amount of his childhood in Katihar, Bihar. He completed his civil engineering at the Bengal Engineering College,

Shibpur, and graduated in 1928. He spent a considerable number of years in Paris where with the support of a patron he opened up an engineering firm in France and also came under the influence of a French expert on hydrology and water management. Bhattacharjee later returned to India and worked in different routine jobs and regularly published his essays in *Jugantar*. In 1939-40, Bhattacharjee 'drifted closer to Marxism' where he regularly published his essays in *Svadhinata*, a Bengali newspaper which served as the official mouthpiece of the Communist Party of India. In the later years of his life 'after witnessing the ruthlessness of law enforcing agencies to root out Maoist militancy (in the seventies) in West Bengal', Bhattacharjee spent most of his life devoted to human rights and was the chairperson of the Association for Protection of Democratic Rights (APDR).[23] Nandy states that Bhattacharjee, late in his life, became a 'disappointed, silent, somewhat sullen person who had also come to regard his environmental activism as a futile misconceived project amidst the widespread public rejection of his position on large dams.'

REASONS FOR OPPOSITION

This section assesses Bhattacharjee's compilation of writings entitled *Swadhin Bharate Nod Nodir Porikolpona* (River Planning in Independent India). This compilation was published in 1986 by Kalam publishers and the three essays specifically detailing out his views on the DVC include Swadhin Bharate Nod Nodi Porikolpona written in 1966, *Damodar Porikolponar Sangskar Chai* (Demand for a Reforming in Damodar Plan) written in 1953 and *Damodar Upotakya Porikalpona o Poschimbonger Biporjoy* (Damodar Valley Planning a disaster for West Bengal) written in 1959 have been contrasted with Saha's opinions here, though Bhattacharjee is writing after Saha and not as a contemporary.

In the essay written in 1953, Bhattacharjee gives several reasons for his insistent opposition to the project for the last six years. In this essay, he exposes a set of politics which he feels is governing the planning of the project, and raises some questions thus, on the development agendas being promoted through the idea of the DVC. He agrees with Saha stating that it has been a colonial conspiracy to reduce India to an agrarian state which will continue to provide raw material, and he is not opposed to the idea of the need to support the reviving of industries in the country, and the possibility of the Damodar Valley Project changing this situation. However, his opposition comes from the fact that the project was not planned in participation and in tune with the views of common people. There are some important insights he gives which again bring in the other engineering view towards nature.

While both Saha and Bhattacharjee are concerned about development and industrialisation and agree that the British tried to confine India as an agrarian nation and raw material provider, and neither necessarily conform with Gandhi's views on industrialisation, the basic difference between Saha and Bhattacharjee lies in the propagation of people based or state centred technologies and hence the visions they see for development in this area around the Damodar. Saha tries to provide an objective analysis to all the scientific developments and decisions, while Bhattacharjee makes a conscious attempt to expose the political motives (which he calls colonial and capitalist conspiratorial motives and motives of the exploiting class). While Saha sees the justice in science in its ability to ensure provision of 'plenty for all' through scientific revolutions, research and economic activity, Bhattacharjee assumes that decisions of justice is implicit in the very application of technologies and their impacts and hence calls for a reconsideration of the way in which the Damodar Valley Project is envisaged. From these three essays and Nandy's analysis we may trace out his key arguments and contrast the same against Saha's ideas.

REVISITING THE COLONIAL CONSTRUCTION OF THE RIVER

Bhattacharjee points out that the British had failed to recognise the four thousand year old ancient irrigation system as the craftwork of the agriculturalists themselves. While Saha credits these problems to the railway lines, Bhattacharjee calls for a relooking at traditional engineering and architectural knowledge in the country and explains that the problems arose in the area in the eighteenth century. He emphasizes the need to make a distinction between channelling of river waters for agriculture and building of 'embankments' for flood control.

He cites the observations of Dr Bentley, Willcocks and others on ancient irrigation practices in Bengal that were four thousand years old and similar to practices followed by the Babylonian and Sumerian civilisations. The floods brought free irrigation for peasants and an added income from fish in these parts for which they paid no taxes. These intricate systems fell into decay during the Maratha raids in the eighteenth century in the Damodar area. After the institution of the Zamindari system under the British, these river channels got mistakenly assumed to be embankments for flood control and the heights of the low embankments were raised. The rights over these embankments and over the waters were transferred to landlords making breaches in the embankments a criminal act. The British had failed to realize that these embankments and channels were in fact the craftwork of the agriculturalists for irrigation and not flood control.

Bhattacharjee disagrees with Willcocks' recommendations that are only limited to reviving these waterways for agriculture, he feels that Willcocks fails to realize that society and civilisation has moved far ahead from these ancient times, and industry and commerce is an important part of the economy as well and in his recommendations lie the coloniser's wish to keep the nation dependent on mainly agriculture.[24] Unlike Bhattacharjee when Saha discusses Willcocks' observation on ancient irrigation practices in Bengal he basically establishes how, while he supports his idea of restoring old waterways, he also recommends that this should be backed with research through a River Physics Laboratory and done less haphazardly in the current age of science.[25] Like Saha, Bhattacharjee holds commerce and industry as important but something that must be divorced from imperial control.

THE DAMODAR PROJECT: NON PARTICIPATIVE AND IMPOSED

In Bhattacharjee's opinion the project is largely an 'imposed and non-participative one' and a conspiracy of the capitalists who used the cries of people affected by flood in these districts as a great opportunity.[26] The project was conceptualised by scientists and experts who have little idea about the daily lives of people residing in these parts. (Here he emphasises on the farmers of Hooghly, Howrah and Burdwan and not the upland farmers)[27]. It is evident that this essay is being written when the fertile lands of some of the project affected farmers are being acquired in these three districts of Hooghly, Burdwan and Howrah for canal constructions. These areas are triple cropped rich fertile lands and an area which gets adequate rainfall and has several traditional water harvesting mechanisms through which prosperous agriculture may continue he observes.[28] In the current scenario, fresh alluvial soil is deposited by the flood on these farmlands which will be stopped once the project comes in. Bhattacharjee argues on behalf of the farmer wondering on whether the farmers will be able to afford the chemical fertilisers that will be sold by the Sindri fertilisers factory once they lose access to this *pali* (fertile alluvial soil)?[29] He calls for justice to the people who suffered severe loss and devastation from floods caused by the raising of the left embankments of the railway lines, who should be compensated with the crores of rupees being spent on British and American governments and engineers for the construction of the project.[30] He is also not convinced of whether the ordinary men can really consume the expensive electricity that the DVC promises to provide. He observes that in spite of the increase in availability of electricity in Calcutta most of the ordinary men still survive on earthen lights.[31] He establishes that the region gets adequate rainfall and the floodwaters bring

in a huge pool of fish stock which acts as additional income for the farmers here.[32]

While Saha believes that the TVA could easily be replicated to the Damodar Valley, in Bhattacharjee's opinion the 'blind copying of the Tennessee Valley Project' will create a lot of problems. His primary concern, however, is that the construction of the project will lead to a destruction of the Calcutta Port which in turn will completely hamper the industrial and commercial activities of the entire eastern region[33]. The floods brought in by the Damodar help to clear the mouth of the Hooghly and this in turn helps the ships to navigate in the area. It is evident from his writings that a Committee was set up at that time just to enquire into the degree of destruction of the Port, however Bhattacharjee is not satisfied with the observations of this committee.[34]

On the whole, his core objections to the project may be drawn out to be located around the faulty planning and technological flaws of the project, while his recommendations include alternative development visions through the dam. He believes that alternative livelihoods gained from fishing should be encouraged; radical changes need to be made where the Maithon and Panchet dams work should be stalled for the next five years; and instead the embankments should be repaired. Adequate scientific research should be conducted on the Calcutta Port and on ways of maintaining the same. Once the project begins to generate hydropower, water transport or navigation should be encouraged so farmers may access the markets on their own. Thus, though Bhattacharjee was in disagreement with the DVC project, he was not too distant from the large number of Indian scientists, engineers and technocrats of his time. He is in agreement with them on the need for industrialisation. In fact, in his alternatives he believes that the river acts as a good trading route between farm villages on its banks and is an easy access for farmers to the market. He is instead calling for better development of water transport to improve domestic trade. Like Saha, Bhattacharjee too tends to confine himself around the immediate issues of inhabitants in the lower tract, the Calcutta port and how to improve commerce and industry, he fails to and is unable to predict the problems of the displaced communities in the upper and middle valley tract articulated many years later by the communities themselves.

THE AFTERMATH

The experience around the DVC shows that in the 1940s the nation's new elite was excited by the freedoms in post-Independence. America and Russia were the two economies that they looked towards for solutions. They stressed on scientific thinking and rationality being the need and

hour of the day like the rest of the world. Modernising was very important for this nationalist project and yet, within these plans of modernity, are situated ominous silences which vocalise themselves later in the seventies and eighties around development plans. The main promise to people around the building of the DVC was flood control, even though numerous other objectives were planned with it. There are no clear estimates on how many people got displaced but unofficial estimates say that the number was at least 1,50,000.[35] People lost their land and livelihoods and floods continued to affect the lower valley in Bengal after its construction.

After the development work started, Saha became more and more of a dissenter, in the 1950s. In an article titled Multi-Purpose River Scheme carrying the Lok Sabha debates in his Collected Works, it is clear that Saha had begun to question the authorities on corruption and money laundering, during the construction of the Konar Dam where he alleges that a Swiss Company, the Greuner Brothers has cheated the Authorities.[36] Klingensmith, in his restropective study, mentions that Saha's imaginations of the 'TVA model were not fully correct and he sought to implement in India what was partially a fiction in the United States.'[37]

Bhattacharjee wrote an essay in 1959, almost a decade after the conceptualisation of the DVC that catastrophic floods have increased as seen in 1956 and 1959. In his article in 1959 Bhattacharjee elaborates that Voorduin never promised that the building of dams would necessarily manage to prevent floods in the lower reaches. In case of high precipitation, the Maithon and Panchet dams would be forced sometime to release the waters. Rather sarcastically he notes that the DVC authorities have been forced to declare publicly that "The DVC never promised that by building dams in the upper tract, floods would be controlled in the lower valley" anyway.[38]

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