**Water, Society and Sustainability**

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**Lecture - 15**
**The Farakka Barrage Project: Historical and Technical Details**

So, in the previous lecture we had talked about multipurpose river valley development projects and development schemes, where we had discussed the political and historical settings or context that led to the emergence of those projects during that particular period of time; that is the immediate post independence era or the immediate post-independence period. Now I would be focusing on one particular case study, which is the Farakka Barrage Project. And the Farakka Barrage Project mainly for eastern India more specifically West Bengal and I will explain that why I am focusing on a Farakka Barrage Project. And this particular lecture or this particular case study I have divided into two parts.

So, in this first presentation on the case study, I would be focusing on the historical and technical components of the Barrage Project are followed by a discussion on the social and environmental repercussions or social and environmental implications of the Farakka Barrage Project, mainly for the inhabitants of the West Bengal more specifically. You know the inhabitants of the upstream and downstream of the Farakka Barrage the Malda and the Murshidabad districts.

And we will get to know that why you know discussing socio environmental implications and repercussions are so very important in a for hydrologys, because it is a particular dam project it not only consists of a technical components, but one has to keep in mind that of course, it has numerous social and cultural dimension; dimensions that really needs to be accounted for.

So, we will discuss that in the next lecture, but here I would be mainly focusing on the technical components of a Farakka Barrage where we will get to know data relating to like when was it you know when was it constructed, we would get to know the details about the pre implementation and the implementation phase. So, it would be mainly restricted to the pre implementation and implementation phase and also little bit on the

post implementation phase, but then restricted only to the technical part of it and the social part we will discuss in our next presentation.

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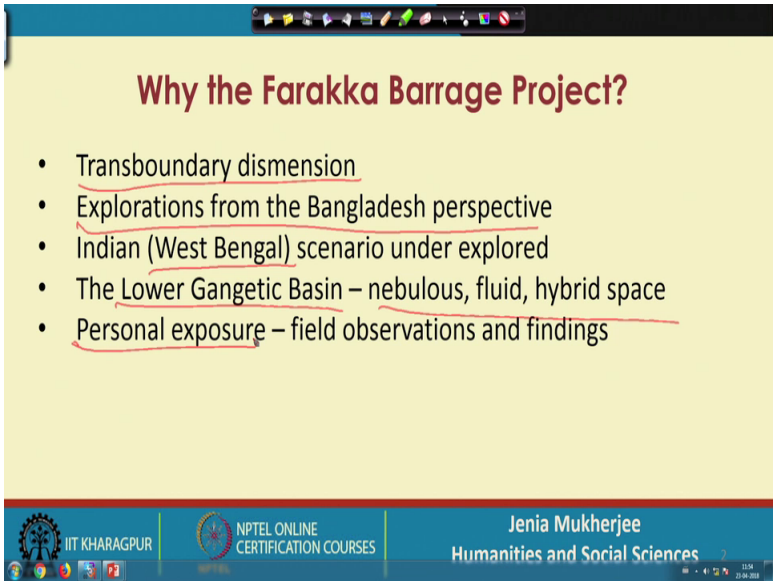


Now, to begin with that out of so many other a barrages, out of so many other dams because we had discussed in a previous presentation, that you know in the immediate post independence period and fallowing that for the next two three decades. India saw India visualize the deconstruction of numerous a big public infrastructures on rivers and water bodies. But then out of all this very important you know massive big infrastructures and dams, why did I choose a Farakka? So, first I would like to explain that why I am focusing on the Farakka Barrage project.

There are few reasons behind this; so the first reason being transboundary dimension. So, it is a very important project in the sense that it also involves and it includes Transboundary dimension. So, which means that I mean there is a geo political aspect and there is a geo political perspective relating to this project, because Farakka has really been a bone of contention, since decades since the implementation of the project between Bangladesh and its downstream country between India and its downstream country Bangladesh. So, we really need to also explore the transboundary water issues the interstate water issues.

So, Ganges is a particular river which is shared by different countries you know including Nepal including India including Bangladesh. So, how you know these kinds of

projects, what are the impacts or implications of these kinds of projects on the geo political relation between or across nations? So, this is an important dimension which needs to be taken into consideration, when we are talking about water society and sustainability. So, this is one reason why I deliberately you know selected the Farakka Barrage, because we will see that it has both intrastate and interstate dimensions. So, in order to have a more detailed discussion on that I now selected Farakka as one of the case studies so, this is one.

Second is that you know explorations from the Bangladesh perspective are there. So, there have been there is a massive literature that focuses on the impact of the Farakka Barrage on Bangladesh on the people of the Bangladesh, on the topography of the Bangladesh of the country of this particular nation, which is located at the downstream you know at the downstream and that is why the situation and the scenario is more complex. So, we find literature from a social scientist we also find a literature or technical details are coming from natural scientist, where to a great extent they had actually ridiculed this particular Barrage Project because literature attest that Farakka has really been hazardous and dangerous for Bangladesh, because it had really increased both floods and droughts in the in the country.

So, we have lots of works or numerous literature from the Bangladesh perspective, but so, far as the Indian perspective or most specifically the West Bengal scenario is concerned, we have very less data. And it is quite a pretty that it is very difficult also to get data to collect and extract data because I know we will see that there is an element of archival silence so, far as you know data is concern you know regarding this particular aspect. And whatever data we have that data is to a great extent linear, because it provides a lot of information about the technical details, but at the same time it does not talk much about you know the condition of the people across both upstream and downstream of the barrage.

So, this is one reason why I would emphasize that now we really need to explore like what had been the experiences exchanges and encounters of people, who had faced the implications of the Farakka Barrage for the last few decades. So, we really need to explore this under explored area, that is why I thought it wise to you know take Farakka Barrage Project because this will give us the opportunity, to explore you know from the

indian site from the West Bengal site[noise]; not only the Bangladesh perspective, but also the perspectives from West Bengal.

Then the next reason is a I say that the lower Gangetic basin it is a nebulous fluid and hybrid space this is also very very important, because if you see that the location if you see the location of the Farakka Barrage project. So, it is in Farakka in the Murshidabad district and this is a part or this is an integrated part of the largest cape of the lower Gangetic basin. And this lower Gangetic basin it is criss crossed by numerous canals rivers rivulets. So, it is a kind of a waterscape, but at the same time it is also as it is the lower Gangetic basin. So, as it is the estuarine deltaic region. So, so where the river actually or the rivers meets meet the sea.

So, this area itself is very complex, in the sense that you know there is very interesting literature on this for example, people geographers like Kuntala Lahiri Dutt they had showed that these space you can neither designate it as land nor you can designate is it as water. So, it is a very complex cape with; I mean complex cape which is which manifests elements of hybridity. So, it is a land waterscape. So, in scapes like this in tropical estuarine deltaic space like this, we need really need to critically discuss whether the construction or implementation of big infrastructure is really fruitful or not.

So, we need to focus on the impact of the Farakka Barrage Project from this perspective as well, that is already it is a nebulous place that already it is a fluid space. So, is it wise to really come up with a big construction like the Farakka Barrage Project on a complex space like this which is a land waterscape and where the environment where the fluvial geomorphology is extremely dynamic and it is always in a flask. So, this is another reason why I wanted to focus on a Farakka to have a more critical perspective on you know the construction of barrage in these kinds of spaces, which are fluid and nebulous and hybrid.

And finally, like this is a personal reasons on a personal note. So, I had got the opportunity, I got chances to visit you know people to visit villages which are located in upstream and downstream of the Farakka Barrage Project. Because this grew out of not my interest you know a mapping the implications of Farakka on the people, but rather it grew out of a different encounter. So, we were asked to document ecosystem services in some of the villages which are the riverine villages. So, I will explain that in this

particular slide in this particular presentation and also in the next presentation in more detail.

So, I had the chance to do some field service to collect some empirical data, you know and to get expose to empirical findings in these places. So, I could talk directly to the people. So, as I had already mentioned that you know this I mean we have less data. So, there is a kind of a lack of data, there is archival silence so, far as construction of Farakka and its impact are concerned.

So, I had the chance to meet people, I had the chance to get to know and get to learn from people's perception that how do they feel. We are not only interested about how the bureaucrats feel, we are not only interested about how the technical persons feel you know those perspectives are extremely important, but at the same time it is also important to know how the people you know feel, how they perceive because after all I mean it is the people, who are having lived encounters in the spaces which to a great extent had been altered due to the implementation of massive projects like Farakka for example.

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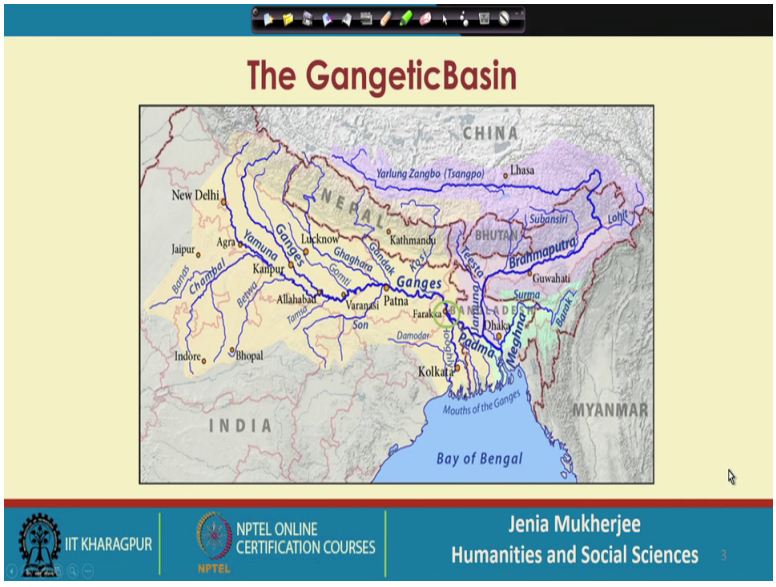


So, this is the Gangetic basin and this is the Farakka this is the location. So, I will explain. So, this is the Bhagirathi Hooghly River and this is the Padma; so the Padma flowing to the Bay of Bengal and getting in touch with the Meghna. And finally, you know falling into the sea the Bay of Bengal and the Bhagirathi Hooghly river coming

down from I mean below the Rajmahal hills, and then passing different districts also passing Kolkata, then the Sundarbans and then finally, you know falling into the bay of Bengal. So, and the Farakka the barrage was constructed exactly at this location called Farakka in the Murshidabad district.

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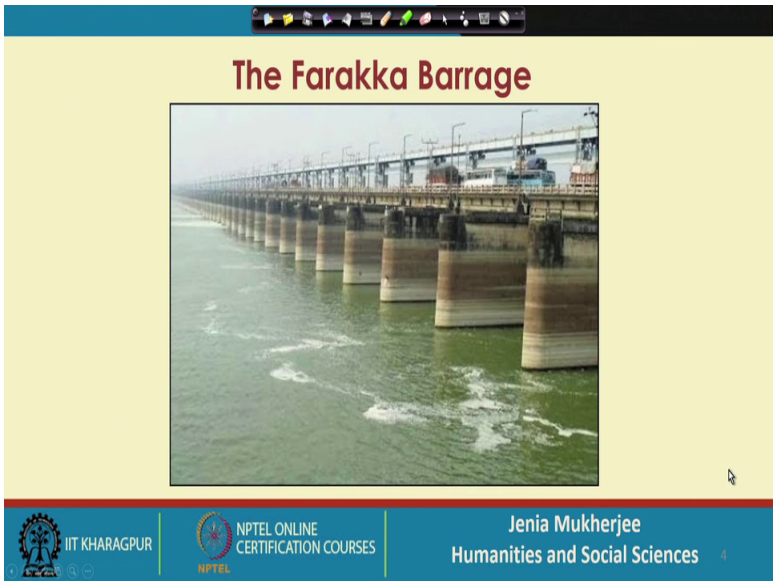


And this is the massive project. So, though it is called a barrage, but it is I mean it is not less than a dam because there are like 112 lock gates. So, it is really massive and there are numerous other components of this particular barrage, which we will discuss. And what I would like to argue or say is that I mean the technical detail of this particular Barrage Project is not only fascinating, but it is also richly and thickly loaded with history, more importantly environmental history of the lower Gangetic basin, which I would very much like to explore and share here. And hence I have kept the title as you know Farakka Barrage not only the technical details, but Farakka Barrage both historical and technical details.

So, what I want to emphasize here is that you know when we are exploring or when we are studying a particular dam or when we are studying a particular barrage, for that matter any other big projects water projects or whatever, it is very important for us not only to focus on the technical details, but also to focus on the political and historical context because that would provide lot of interesting insights, which will make us aware you know about the subtleties and nitty gritties of the project, which each and every

person associated with this project which each and every person trying to be become knowledgeable about the project should get to learn.

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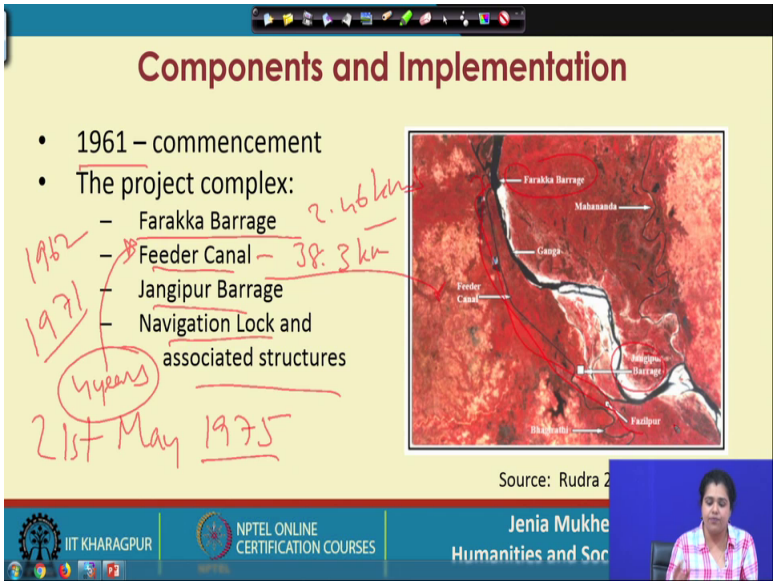


So, yes these are you know some important details about the project. So, the Farakka Barrage project authority I mean it is formed in the 1961 and then the project was laid out in 1962 and so, as I mention it is a massive project. So, the entire Barrage Project complex it actually comprises of this 4 key elements one is the of course, the Farakka Barrage which is 2.46 kilometers long roughly followed by this you know this is the barrage and this is the feeder canal the long feeder canal the long 38.3 kilometers feeder canal, which was mainly which was mainly designed and constructed to carry the water from the. So, carry the induced water from the Ganges to the Bhagirathi to increase the flow of the Bhagirathi Hooghly River and the Jangipur Barrage.

So, it is located here and also you know other important components like a navigation locks and associated structures. So, this is in brief the major elements or the major components of the project, and this feeder canal. So, it was commenced in 1961 and the project was laid out in 1962 and by 1971 it was complete, but then the date of commence I mean finally, it was inaugurated on 21st May 1975.

So, there is a gap between 1971 and 1975 a gap of 4 years between 71 and 75. So, the feeder canal was constructed within this gap of the 4 years. So, within the gap of this 4 years is very important feeder canal it was constructed and as we can see it is a long

stretch and it was mainly constructed to draw water for induced water supply from the Ganges to the Bhagirathi Hooghly river in order to improve the river regime and navigability of the Bhagirathi Hooghly river to revive the to revive and restore the health of the Calcutta port.

Now, this is the crucial point which again I will elaborate and what is the important is that the feeder canal was constructed out of the purpose of you know I mean the whole purpose was to reduce siltation and salinity. And so, it was thought that it would be able to a flush out the sedimentation or flush the siltation from the estuary. And I mean to a great extent to would also play an important role in the reduction of floods in the catchment area, and it would also improve the drainage capacity of the Bhagirathi and the upper Hooghly stretch.

So, these are the major reasons why this very long feeder canal was constructed between 1971 and 1975 and finally, the Farakka Barrage Project was inaugurated in 1975.

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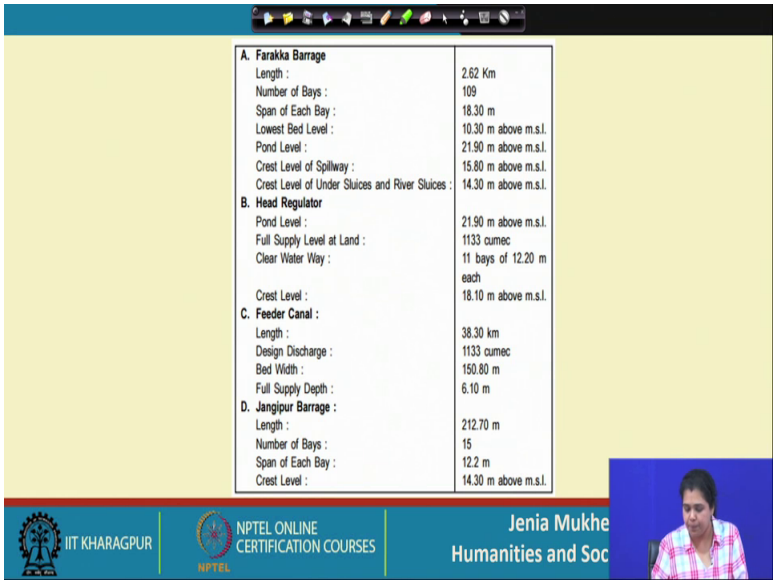


Now, these are some of the technical details of the project again, number of bays pond level length head regulator details about the head regulator feeder canal, 38.3 kilometers. So, all the details about some of the major components of the Barrage Project and you have to keep this in mind that in the official report it was mentioned that this 2.46 kilometer Farakka Barrage along with 3.8 kilometer feeder canal, it was supposed to divert 40000 cusecs of the Ganges water to the Bhagirathi Hooghly distributor.

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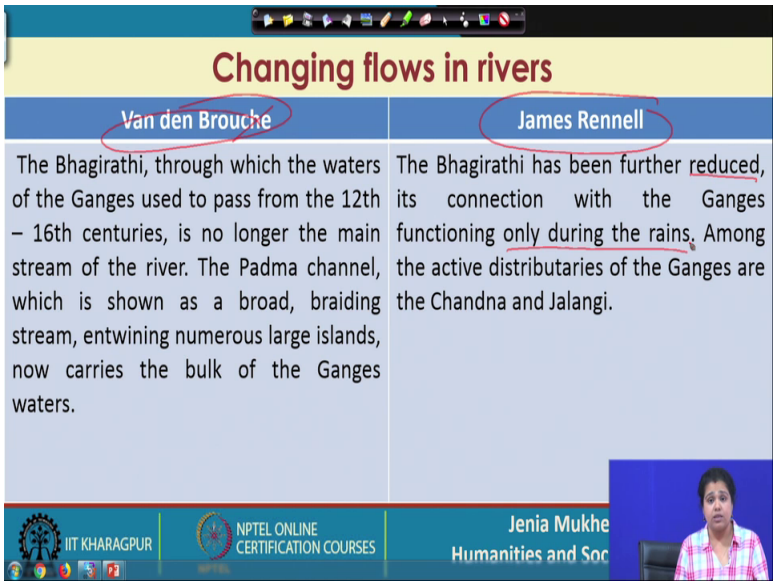


Now, now I am interested to share with you know environmental history of this regime. So, why we really need insights from environmental history to understand Farakka Barrage? Now actually it is very important for us to know that why at that particular location the Farakka Barrage was constructed, during that particular period of time.

So, now we have to keep in mind that though the project was commenced in 1961 60s and though the project. Finally, it was inaugurated in the 70s mid-seventies yet the I mean discussions and opinions that a barrage should be constructed somewhere near Farakka or somewhere below the Rajmahal hills these idea was already generated even 100 years before the construction of the barrage. So, there is a long history and there is historical context that provides interesting insights about the pre implementation phase.

Now if we get insights from environmental history, then we will find out that that you know the 17th and 18th centuries these were periods of massive change, massive change for the riverine topography of the area.

And if we go through history books most interestingly book written by Radhakamal Mukerjee which is called the 'Changing phase of Bengal' there he writes that how the distributaries they their flows and the patterns were actually changing during this particular period of time. And this is attested and this is validated by the different cartographic evidences that we have from the 15 16 centuries to the 17 18 centuries for example, we have billion cartographers. So, cartography means map making and

cartographic evidences by cartographic evidences I mean the maps, so which are very rich historical sources for example.

So, now if we compare two very interesting maps one by the Portuguese cartographer called (Refer Time: 21:01) Van Den Brouche and the other by the cartographer British cartographer James Rennell. So, James Rennell is a more popular he is more (Refer Time: 21:21) and he has thoroughly surveyed lengths and breadths of eastern India specifically Bengal the Bengal province and if you compare this two maps we find that already by the 17th century the Bhagirathi had been reduced the flow of the river, it had significantly reduced and you know the connection with the Ganges had also been disrupted and Rennell's map shows that the river could only function during the monsoons during rains.

And so among the active distributaries of the Ganges were the Chandna and Jalangi and also the Padma. So, in brief if I say that you know previously Padma was not a very significant stream of the Ganges and the flow of water in the Padma was much less compared to the flow of river in the Bhagirathi Hooghly, but since the 1718th century what happened is that there was a decline in the flow of the Bhagirathi Hooghly river and on the other hand Padma became a very significant stream. So, that affected the entire riverine topography and that to a great extent you know determine the history and geography of Bengal.

So, what happened is that as there was a sort of eastward migration I mean in the flow of the river. So, eastern Bengal it was becoming prosperous and on the other hand western Bengal it started becoming (Refer Time: 22:56). And mainly districts like Burdwan districts like Hooghly you know the prosperity of these districts it started declining due to the change in the courses of river, but what was most important or what was most crucial was that this these particular change was affecting the health of the Culcutta port.

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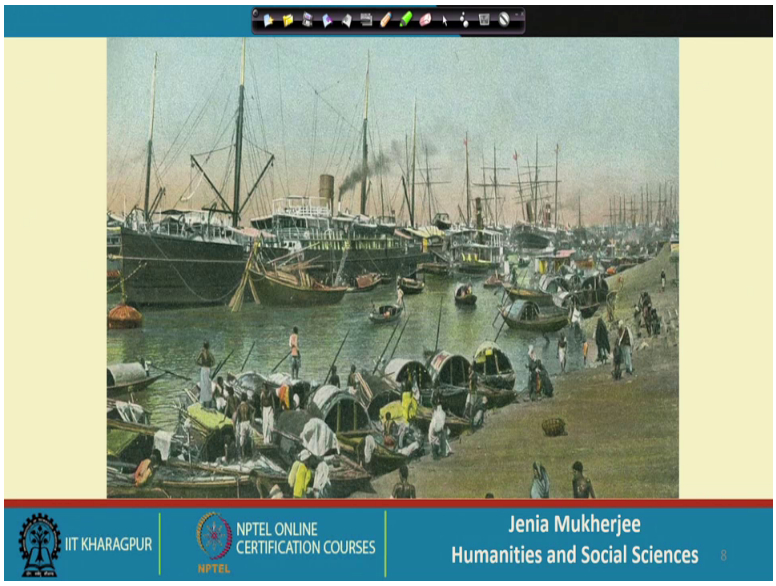


Yes. So, this was the vital issue that the Calcutta port it was you know failing to accommodate big vessels. And of course, this was very important Calcutta port was very important for or rather it was a lifeline for the British you know, it played a very important role relating to trade and transportation and revenue generation for the British. So, the colonial purpose of revenue generation and a colonial purpose of massive trade and transportation through the Calcutta port it was finally, getting effected due to the changes in flows of river.

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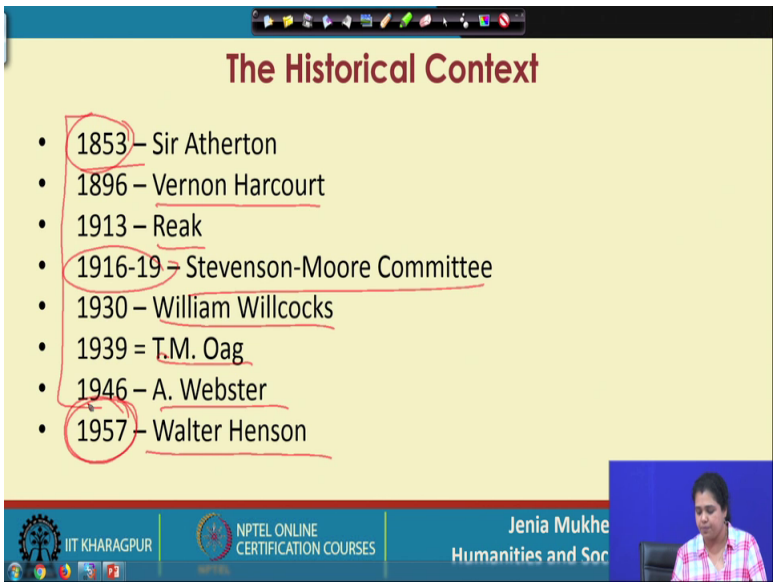

So, it became vital for the British or rather the British became anxious to I mean to at this particular situation and so they became very aware that something needs to be done you know at particular maybe at a particular point at a particular junction a barrage or a dam needs to get constructed, that would artificially control the flow of the Bhagirathi Hooghly River, because the flow of the Bhagirathi Hooghly river was extremely important for reviving and restoring the health of the Calcutta port.

So, as early as 1853 in the opinion of Sir Atherton you know we find from Colonial reports that Atherton's said that Barrage had to be needs to be constructed at the particular point. So, this particular opinion and this idea was also followed by several other colonial officials like a Vernon Harcourt like Reak and in the Stevenson Moore Committee report it was emphasized that, the barrage really needs to get constructed and we can also all I mean we can see that the Stevenson Moore Committee report it was published in 1916 and 1919. So, by that time as time was passing. So, the health of the Calcutta port was I mean it was getting more affected.

So, the deterioration level was increasing because the river the distributary was also deteriorating. So, in the Stevenson Moore Committee report we find that you know there was whole lot of emphasis on the construction of the barrage followed by you know the and we remember you know the great debate the took place in 1930s and we also had discussed about William Willcocks views and all that and his particular idea about overflow flow irrigation. So, Willcocks also we find from Willcocks lectures and Willcocks writings that Willcocks was also in support of the construction of the fort port sorry construction of the barrage to revive or resuscitate the port.

Then T M Oag A Webster everyone; so this entire period between 1853 and 1946. So, in the opinions and in the committee reports during the colonial time, it was highly emphasized that the barrage needs to get construct. So, finally, after independence in 1957 Walter doctor Walter Henson he was he came to India from the united states as the main river expert, as a technical expert and he finally, remarked and he argued that the best ever best technical solution to tackle the condition of the Calcutta port could only be through the construction of a barrage at Farakka.

And this was absolutely clear by 1950s. So, it is a long period of time between eighteen fifty three fifties. So, 1850s and 1950s that finally, determined and decided the fate of the

project and is very interesting to find out here that you know and insights from the Boundary Commission.

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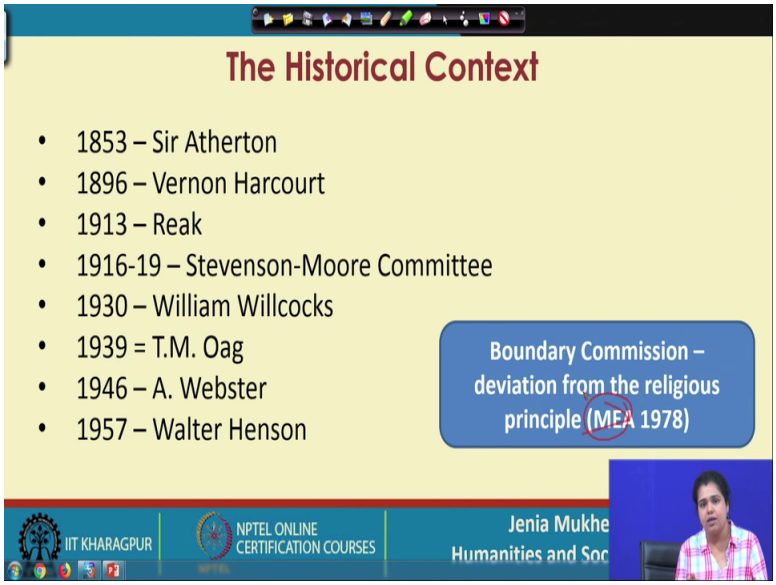


So, when I was consulting various official documents relating to this particular project. So, I got a very interesting document of 1978 document from the ministry of you know Ministry of External Affairs.

And in the document what I found was that a particular decision by Cyril Radcliffe and the boundary commission. So, we all know that India to a great extent you know the partition to a great extent, it was mainly done on the principle on the religious principle. So, the contiguous Muslim majority districts would go to a state would go to Pakistan and you know the Hindu contiguous Hindu majority districts would be there in Bengal right in West Bengal.

Now, what happened is that Murshidabad it consisted of Muslim majority, but as Farakka was so very important for India. So, what happened is that Murshidabad was not compromised or Murshidabad was not given to Pakistan or eastern Pakistan rather Murshidabad remain with us. On the other hand compensation was made by when Khulna which was not a Muslim majority district, but which was a Hindu majority district Khulna was given to Pakistan.

So, these are some interesting things which show that you know though religious principle was; I mean deciding factor. So, far as partition was concerned, but on the other hand geopolitical issues and issues like where particular barrage would be constructed, and how that would determine the political and economic fate of a nation, that became more deciding, and that became a more dictating factor rather than the religious variable in this particular context.

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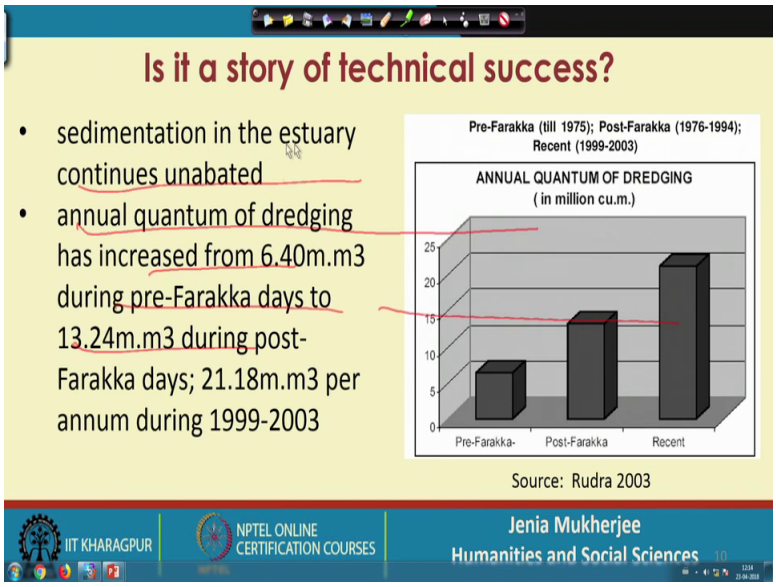


So, finally, is there a gap between the official projection and the actual reality. So, from 1850s to 1950s we have seen that how most of the people how the big shots or the experts, they had really talked in favour of the construction of the barrage. And the idea was that it was extremely important it was vital to revive Calcutta port through you know revival of the river regime and (Refer Time: 30:44) Bhagirathi Hooghly.

But then is it a story of technical success? Let us forget about social and economic and environmental implications for the moment. And let us only concentrate on the technical aspect for now. So, even if you only concentrate on the technical component for now, and if I raise this particular question that, is it a story of technical success then also we will find unfortunately and I do not know whether it would be an exaggeration to say like this or not. But then I this is not my opinion, but I am you know sharing the opinion of the river experts people like Kalyan Rudra or people like (Refer Time: 31:26) who had said

that this project is actually a technical fiasco, because we remember that why the feeder canal was constructed.

The feeder canal was constructed in order to reduce the sedimentation load and in order to check sedimentation in the estuary, but unfortunately even today sedimentation in the estuary sedimentation in the estuary continues unabated. And the annual quantum of dredging it has increased from 6.40 m to during pre Farakka days to 13.24 4 during Farakka days and further it has increased to 21.18 per annum between 1999 and 2003.

So, there are detailed reports and there are also updated reports relating to the annual quantum of dredging, and it shows that siltation, sedimentation, these problems which were supposed to be met by the I mean through the construction of the barrage along with its components like the feeder canal and all unfortunately had not been met. So, the geographers and the river experts they are not very satisfied about the project, and you know we do not get to hear much appreciation about the project and it is to a great extent considered as a technical failure. And when I mean during those days during the 50s and 60s when the idea was you know in the year that this particular project will be taken forward, then eminent river experts like for example, Kapil Bhattacharya he totally he was totally against this particular project.

But very unfortunately he was you know declared as a spy of Pakistan and many other you know derogatory things were told and he was humiliated. But today we see that how the warnings that were generated by people like Kapil Bhattacharya. And all how these had really what translated into reality. And how Farakka had to a great extent the Barrage Project to a great extent had not been able to deliver what it had actually promised you know so far as official reports are concerned.

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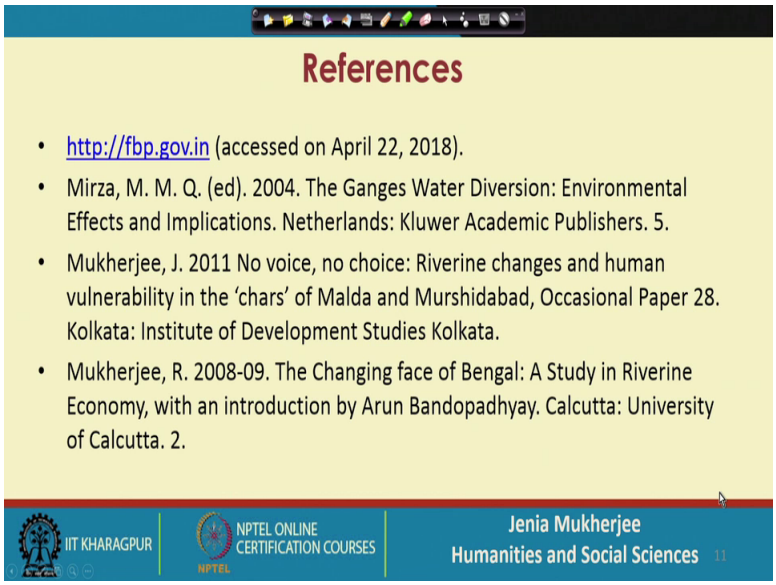


So, these are the references so, you can also go through the official site and as I mentioned there are some studies from the Bangladesh perspective. So, Mirza is one such authority on that, then few works by I mean I had also done the work on Farakka mainly focusing on the char's and the river and islands, which I will be focusing in my next presentation and I mean I mean the details would be shared in a more elaborate way in the following presentation.

And the book by R K Mukherjee changing face of Bengal a very important book, which talks about how history and geography of Bengal, actually started getting altered since the 18 century due to changes in the courses of river. So, how changes in courses of river can actually determine changes for particular cities and you know districts and particular geographical spaces. So, this is where we really need to understand the relationship between rivers and society the cyclical relationship between rivers and society.

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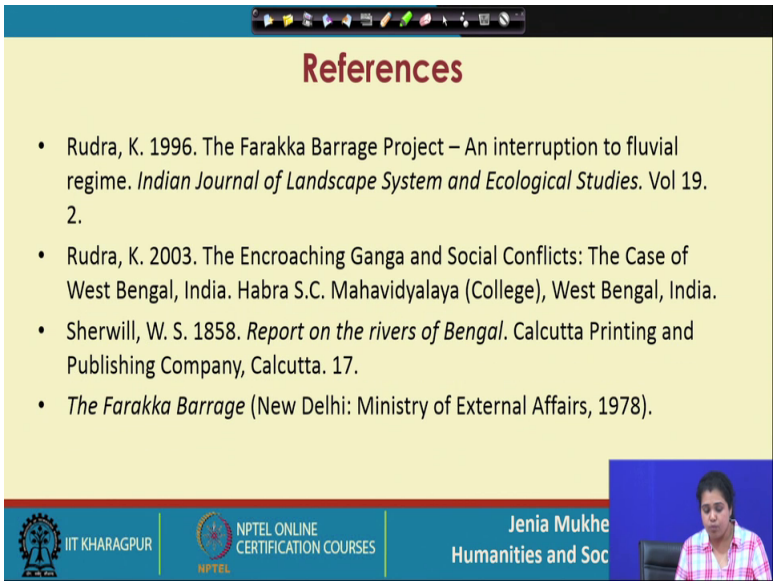


Some few more references I mentioned about Dr. Kalyan Rudra. So, Kalyan Rudras work on Farakka barrage. So, Kalyan Rudra had actually counted this increase in the dredging. So, as we are discussing about the annual quantum of dredging how it has increased from this particular year to this particular year. So, all these had been calculated by experts like Kalyan Rudra. And this very interesting reference that I talked about that gives us detail about the about the decision of the boundary commission during the partition of India. And so, this is the ministry of external affairs primary document which is published in 1978.

So, thank you. And in the next presentation let us discuss, and let us focus on the social and environmental implications of the project.

Thank you.