

Water Economics and Governance
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Lecture - 52
Water Governance in India:
Water Programmes and Policies (Contd.)

Hello friends, earlier this week, in the previous session we were talking about the programs and policies related to water supply. And in this session we will talk few more programs and policies on other aspects. Like groundwater, abstraction, irrigation all those things will be covering in this session.

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Groundwater Programmes and Policies

- *Central Ground Water Authority (CGWA)* was constituted under Section 3 (3) of the *Environment (Protection) Act, 1986* to regulate and control development and management of ground water resources in the country.
- The CGWA is regulating withdrawal of ground water by industries/ projects in **802 Over-exploited and 169 Critical Assessment Units**.
- CGWA has notified **162 critical/ overexploited areas** in parts of NCT Delhi, Haryana, Punjab, Andhra Pradesh, Rajasthan, MP, Gujarat, West Bengal, Uttar Pradesh, Karnataka, Tamil Nadu, UT of Puducherry and UT of Diu for control and regulation of development of ground water resources. For enforcement of the regulatory measures in these areas, concerned Deputy Commissioners/ District Magistrates have been directed under Section 5 of Environment (Protection) Act, 1986 to regulate ground water development in these notified areas.

Source: <http://www.cgwb.gov.in/aboutcgwa.html>

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So, to begin with the groundwater programs and policies in India, were again like largely considers that groundwater is a property of the one who owns the land; however, there has been, there has been notifications or there has been recent court judgment, which says that the deep groundwater is a property of state, or property of government. So, until unless these ambiguities are removed, because if I own a piece of land, and the groundwater beneath is my the groundwater beneath my land or the land, that I own is property of the owner of the land; however, when the court says that, that is only for the shallow groundwater, the deep groundwater belongs to the state, but until unless it is

further clarified like, how deep is the property of state and what is the way there has been actually lot of issues related to the groundwater.

Earlier we discussed some of those. So, in judiciary if you see the judiciary actually have given certain decisions where it restricts the abstraction of groundwater, when there is dip when the groundwater abstraction causes depreciation in the water table in someone else's territory. So, I own a piece of land, I am abstracting groundwater from that, I have right to abstract groundwater because the groundwater beneath the land I own is my property, but as per the right to life or right to hold properties, I should not be intervening into the others territory.

But if I do excessive pumping in my land; obviously, the ground water table is likely to deplete now if groundwater table starts depleting it will affect the neighbor's field also. So, there is possibility of the groundwater depression in someone else's territory. Now supreme court has given a decision on to that judiciary has given a decision on to that that, depreciation should not extend to the territory of the other people.

But it is very difficult to monitor how this depression can be stopped from moving in from territory of ones to another anyway coming on to the programs and policies. The groundwater central groundwater authority which is CGWA was constituted in 1986, by under section 33 of the environmental protection act. The idea was to regulate and control the development and management of groundwater resources in the nation. This CGWA is regulating withdrawal of groundwater by industries by projects in over 800 over exploited, and around one 70 critical assessment units.

So, this like the these are identified as over exploited aquifers over expected groundwater resources or critical assessment units. The CGWA has notified around 162 critical or overexploited areas in parts of national capital territory Delhi, Haryana, Punjab and Rajasthan MP Gujarat West Bengal also various states for control and regulation of the development of the groundwater resources.

For enforcement of the regulatory measure in these areas, concerned deputy commissioner or district magistrate have been directed under section 5 of the environmental protection act of 1986, to regulate groundwater development in these notified areas also. So, the power has been basically given from the CGWA, it has been

the power or one can say the responsibility has been given to the concern deputy commissioners or district magistrates in these areas these critical or overexploited areas.

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Groundwater Programmes and Policies

- Construction of new ground water structures is prohibited in the notified areas.
- Permission of drilling tubewells is being granted only to the Govt. agencies responsible for drinking water supply.
- To enable the States to enact Ground Water Legislation, a *Model Bill to Regulate and Control Development of Ground Water* has been circulated by the *Ministry of Water Resources* to all the States/UTs.
- So far the states of *Andhra Pradesh, Goa, Tamil Nadu, Kerala, West Bengal, Himachal Pradesh and Union Territories of Lakshadweep and Pondicherry* have enacted and implemented groundwater legislation
- Various states have their own groundwater policies and acts

Source: <http://www.cgwb.gov.in/aboutgwa.html>

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To look for how much groundwater abstraction is taking place what is the effect of this what as whether it is against the norms or it is well within the permissible regions. So, these things are being explored and overall monitoring is being done by the central groundwater board.

Further the construction of new groundwater structures is prohibited in these notified areas. So, one cannot straight away like dig a well or put a pumping station for pumping groundwater in these areas. They need to have appropriate approvals beforehand. The permission of drilling tables is being granted only to the government agencies responsible for drinking water supply. So, particularly in these notified areas, it is the government agencies which are responsible the municipalities or local bodies Panchayati raj institutions, those who are responsible to ensure the drinking water supply.

So, special approval is being granted for withdrawing groundwater to only these state or these government agencies for withdrawing groundwater for the purpose of drinking water supply. Otherwise the generally the groundwater extraction has been stopped. To enable this state to enact on a groundwater legislation, a model built to regulate and control development of groundwater has been circulated by the ministry of water resources to all state and union territories.

So, ministry of water resources and of course, now it has renamed water resources and Ganga regeneration; so, this has in it was the model bill was circulated earlier that time it was referred as ministry of water resources only. So, they prepared a model built for regulating and controlling the development of groundwater, and that bill was circulated to all state and union territories; however, few of them have accepted and enacted accordingly for implementation of the groundwater legislation. So, Andhra Goa Tamilnadu Kerala West Bengal Himachal and union territories of Lakshadweep and Pondicherry has accordingly as per the model bill, they have enacted and implemented the policies and legislation related to the groundwater.

Various other states have their own groundwater policies and act. Like, up has it is own groundwater policy and act MP has it is own Maharashtra Rajasthan so, many of these states have their own regulations. Not only in respect to the groundwater, but in respect to various other things. And they are they are authorized to do so, they are powered to do so because as per our legislation as per our constitution the water is a state subject. So, state can have those kind of specific regulation differing from the central, central cannot be an enforcing agency until unless the constitutional amendments are made. So, when the central cannot be an enforcing agency, it can just recommend or it can just suggest it is up to states to accept that or not.

So many follow the guidelines or the follow the suggestions driven by the national status which has come from the center government, while many states have their own local issues local challenges and they make their regulation their policy which is suitable to that system only.

So, in that sense many actually do not follow the instructions from the center related to the policy, and management of the water resources. The role of central as per constitution is limited primarily to the dispute management only. So, apart from ground water there are irrigation programs and policies have also evolved from time to time.

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Evolution of Irrigation Programmes and Policies

- Since independence, states have enacted irrigation laws that generally follow the pattern of British Rule.
- An *International Commission on Irrigation and Drainage (ICID)* was established in 1950 as a Scientific, Technical and Voluntary Not-for-profit Non-Governmental International Organization (NGO) with headquarters in New Delhi, India, with an objective to enhance the worldwide supply of food and fibre for all people by improving water and land management and the productivity of irrigated and drained lands through appropriate management of water, environment and application of irrigation, drainage and flood management techniques.

Source: <http://www.cwc.gov.in/main/ICID/welcome.html>

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Since independence states have enacted irrigation laws and generally follow the pattern of the British rule. So, what was there in the colonial period in the British rule, that has largely been followed; however, right after the independence in 1950 the international commission on irrigation and drainage as a NGO non-nonprofit or nongovernmental international organization, was constituted and its headquarter was in New Delhi, India.

It has an objective to enhance the worldwide supply of food and fiber for all people and improving water land management water and land management, and the productivity of irrigated and drainage land through the appropriate management of water or giving the policy decision, because it was a private body.

So, it cannot manage these things, but it used to basically from time to time provide suggestions do those kind of studies, and in a way acting as a support basis for the management of water environment and application of irrigation, drainage and flood management techniques.

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Evolution of Irrigation Programmes and Policies

- *The Rajasthan Irrigation and Drainage Act (1954)* maintains the right of the state to determine whether surface water is to be used for irrigation or drainage schemes based on whether the scheme serves 'public purposes'.
- In *Madhya Pradesh*, the *Irrigation Act 1931* been maintained, and the *Regulation of Waters Act (1949)* vested 'all rights in the water of any natural source of supply' in the Government.
- Similar policies were retained in the *Bihar Irrigation Act (1997)*.

Source: India: Evolution of Water Law and Policy, by Cullet P. and Gupta J. in *The Evolution of the Law and Politics of Water*, Springer (2008)

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Later on in fact, on the same line government agency was also formed, there has been in between there has been various irrigation programs and policies came from different states. So, Rajasthan irrigation and drainage act which maintains the right to state to determine whether surface water is to be used for irrigation, or drainage schemes or it has to be basically for public purpose.

They have the Madhya Pradesh also has it is irrigation act back in 1931 which was maintained and they framed a regulation of waters act in 1949 where all rights of the water was reserved by the state and a natural source of supply, there are similar practices were retained in the Bihar irrigation act. So, the different states have their own different acts related to groundwater, related to surface water, related to irrigation policies. And In fact, in the line of the national water policy which was in 1992 the earlier one and then 1992, 2002 and 2012. .

So, this in the line of national water policy the state many states have their own state water policy. Like, UP has it is own state water policy, then there is a Maharashtra state water policy, Bihar prepared a draft in 2009 and around 10, for it is state water policy. So, the different state have their own water policies, and that basically put forward the rules and regulations for the irrigation programs and policies as well.

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Evolution of Irrigation Programmes and Policies

- The *Indian National Committee on Irrigation and Drainage (ICID)*, set up by Ministry of Water Resources, Government of India in 1990 for coordination of various activities including collaboration and compilation of information/data, its publications and dissemination of information and activities in the field of irrigation, drainage and flood management.
- It has also been entrusted with the work of appraisal and monitoring of Research and Development (R&D) schemes funded by the Ministry of Water Resources.
- The ICID has drafted report of State Irrigation Acts, many of which is available on the website of central water commission.

Source: <http://www.cwc.gov.in/main/INCID/welcome.html>

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So, in the line of that international NGO, which we were talking just couple of minutes before, the Indian national committee for irrigation and drainage was also set up by the ministry of water resources government of India in 1990. So, this was rather a government body, the earlier was NGO, but the this ICID which is Indian national committee on irrigation and drainage was government body set up by the ministry of water resources government of India, and the role of this was the coordination of various activities including collaboration and compilation of the information and data.

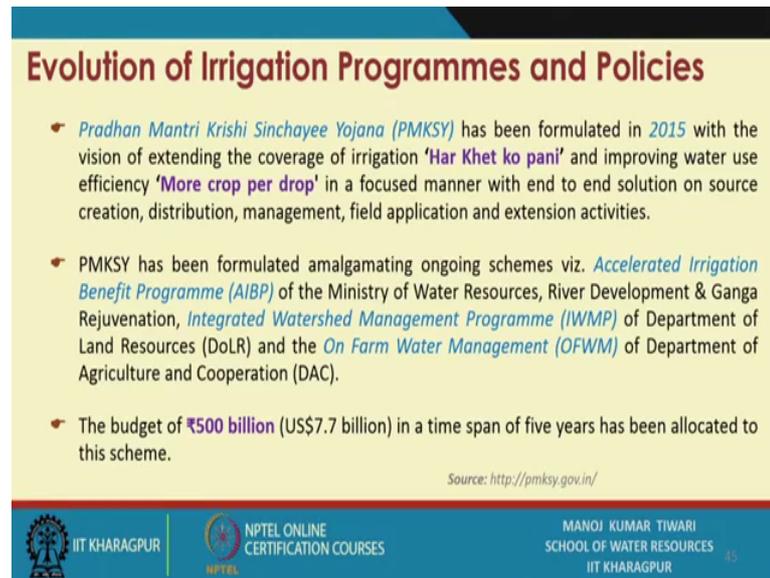
Its publication and dissemination of information and activities in the field of irrigation drainage and flood management. So, this was more focused onto the irrigation purpose over the earlier committee was on water supply irrigation flood drought management all those aspects. So, this committee was interested with the work of appraisal and monitoring of research and development schemes funded by the ministry of water resources.

So, this is the committee which looks for the research and development schemes in the area, and it has drafted a report of state irrigation acts many of which are available on the website of central water commission. So, the review of different state irrigation acts what are the policies adopted what are the challenges what is being done what is lacking.

So, all those kind of this ICID has reviewed, the various state irrigation acts, and these reviews are available on the website of central water commission. So, like it reviewed

the up and Punjab which is available in one volume. So, there are several volumes of such reports are available, and those who are interested can go actually and access the website of central water commission and ICID so, they will find these details on the website.

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Evolution of Irrigation Programmes and Policies

- Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) has been formulated in 2015 with the vision of extending the coverage of irrigation 'Har Khet ko pani' and improving water use efficiency 'More crop per drop' in a focused manner with end to end solution on source creation, distribution, management, field application and extension activities.
- PMKSY has been formulated amalgamating ongoing schemes viz. Accelerated Irrigation Benefit Programme (AIBP) of the Ministry of Water Resources, River Development & Ganga Rejuvenation, Integrated Watershed Management Programme (IWMP) of Department of Land Resources (DoLR) and the On Farm Water Management (OFWM) of Department of Agriculture and Cooperation (DAC).
- The budget of ₹500 billion (US\$7.7 billion) in a time span of five years has been allocated to this scheme.

Source: <http://pmksy.gov.in/>

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In the recent times the Pradhan Mantri Krishi Sinchayee yojana or the prime ministers Krishi Sinchayee yojana which is also called. So, PMKSY was formulated in 2015 with the vision of extending the coverage of irrigation to each and every field. So, there was slogan on [FL], so that means, the water should reach to each and every field, and also aiming the improving water use efficiency.

So, there was another slogan, like more crop per drop. So, each drop should be utilized in such a fashion that it can give the optimum crop production, it can be utilized for optimum crop production ok. So, that was the slogan more crop per drop. So, under this Pradhan Mantri Krishi Sinchayee yojana, there was it was basically in a focused manner, planned for end to end solution on the source creation distribution management, field application and extension activities for irrigation purpose. And the idea was to bring each and every agricultural field under the some sort of irrigation facility. So, this was formulated amalgamating various ongoing schemes.

So, there was accelerated irrigation benefit program by the ministry of water resources river development and Ganga regeneration. There was integrated water set management

program, IWMP of the department of land resources, and the on-form water management program of the department of agriculture and cooperation. So, all these was amalgamated, and this Pradhan Mantri Krishi Sinchayee yojana took it is shape based on these thing.

The total budget allocation for this scheme is rupees 5 100 billion in a time span of 5 years which is to be spend for the purpose ensuring that the coverage of irrigation extend to the entire nation.

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River Interlinking

- First proposed in 1980, by the *Ministry of Water Resources* in its *National Perspective for Water Development*.
- In 2002, the *Supreme Court of India* ordered in a public interest litigation case that the government should complete linking the rivers in India by 2014 (Writ Petition (Civil) no: 512/2002).
- Inter-link project has been split into three parts: a northern Himalayan rivers inter-link component, a southern Peninsular component and an intrastate rivers linking component.
- The project is being managed by India's National Water Development Agency (NWDA), under its Ministry of Water Resources.

Source: India: Evolution of Water Law and Policy, by Cullet P. and Gupta J. in The Evolution of the Law and Politics of Water, Springer (2008)

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There was another interesting project for say, was the river interlinking which was first proposed in 1980 by the ministry of water resources in it is national prospective of water development document; however, nothing has been done.

In 2002, the supreme court of India gave it is recommendation on a public interest litigation case. So, that government should think or complete the linking of rivers, and they sort of gave a timeline also that it should possibly be done by 2014 of course, it has been passed and we have not been there, but still at least the discussions resurfaced back in that phase, the prime minister at that point of time Atal Bihari Vajpayee was also in very much favor of this interlinking project. And he sort of encouraged this thing, and that time it started taking a shape.

So, interlinking project has been split into 3 parts. A northern Himalayan river interlink component, a southern peninsular component and interstate sorry intrastate river linking components. The project is being managed by India's national water development agency, and WDA is actually looking for this river interlinking project. And which is comes under the ministry of water resources.

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River Interlinking

- The rationale for river interlinking is that while some parts of the country are facing water shortages, other parts have excess water. Therefore, inter-basin transfer will export from basins with excess water to basins with water shortage, and will help capture and store rainwater.
- This project will promote big dam building and coincides with the World Bank view that India still has relatively little capacity to store water and that major investments are required in small and big projects, including large dams.
- The first Memorandum of Agreement between Uttar Pradesh and Madhya Pradesh was signed in 2005 to link the Ken and Betwa rivers.
- Initially, some states such as UP, MP, Haryana, Rajasthan and Tamil Nadu were in support of the scheme, whereas Kerala, Bihar, West Bengal, Assam, Punjab, Chandigarh and Goa opposed it. Some states were conditionally in support.

Source: India: Evolution of Water Law and Policy, by Cullet P. and Gupta J. in The Evolution of the Law and Politics of Water, Springer (2008)

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The rationale or the idea for the river interlinking is that in our country because there is a vast variation in the availability of water resources, and the nature or the type of rivers that flow. So, we see that some parts of the country are facing water shortage while other parts are under flood with lot of excess water.

So, if the inter basin transfer could be arranged it will be possible to export water from the basin with access water, where there is a flood situation or difficulty to store water or problem related to the high flows. So, the water could be basically taken up from those basins, and it can be exported to the basins where there is water shortage, where there is not much of water available. So, this will help capture and sort of storing rainwater also. So, actually this project has multi fold objective. It is not only because the rivers will be typically interlinked either by the canal system or by the subsurface structures.

. So, a huge storage capacity will be built under that, because if one is basically laying down long canals. So, there is a huge capacity develops for this storage of the water. So, when there is a flood in let us say one part of the nation, and you have a canal linking

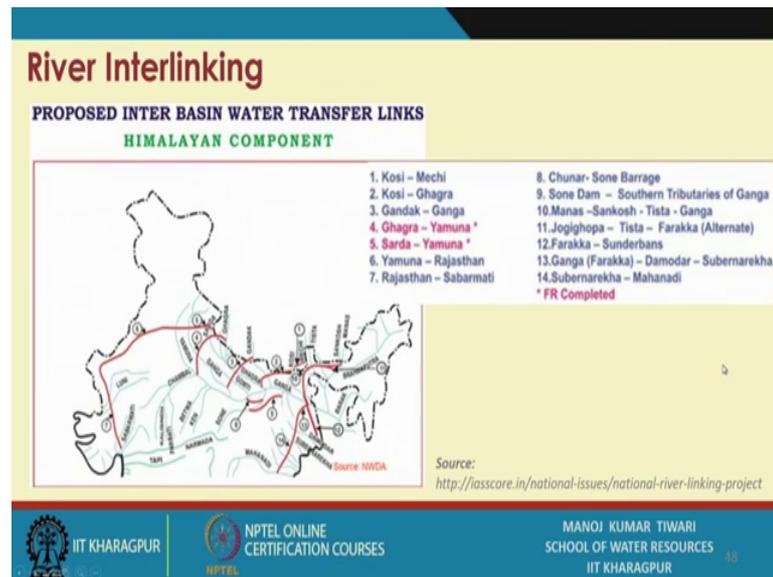
system. So, the water can be diverted to the canal which flows to the drier region, and water could be supplied to the drier region.

So, that was the idea the project was to promote the big dam building and concise with the World Bank view that India still has relatively little capacity to store water. And major investment are required in small and big projects including large dams. So, that was the World Bank opinion and in river interlinking project also because if you want to store the water, we as a nation if you see that we receive the maximum precipitation in the phase of just 3 months, in the window of some 2 to 3 months. That is the time when we get the maximum rain of the entire rainfall around 80 percent or even more than 80 percent comes in a span of just those 2 3 monsoon months.

Huge volume of water in just 2 3 months and we do not have adequate capacity adequate ability to store it, it will likely to basically flow and creating flood in some regions and eventually find its path to the sea, and become unusable. Now if we create these storage structures, the water can be stored in the form of canals or can be stored in the form of a reservoir those kind of system, if we make let us say big dam so, a lot of water can be stored there, and it could be connected to the regions of draught.

The first memorandum of agreement was made between UP and MP which was signed in 2005 to link Ken and Betwa rivers. Initially some states such as UP MP Haryana Rajasthan and Tamilnadu were in support of scheme, while various other states such as Kerala Bihar West Bengal Punjab Chandigarh Assam, were actually in the oppose of it; however, with time some states further came into the favor some put through their conditional support.

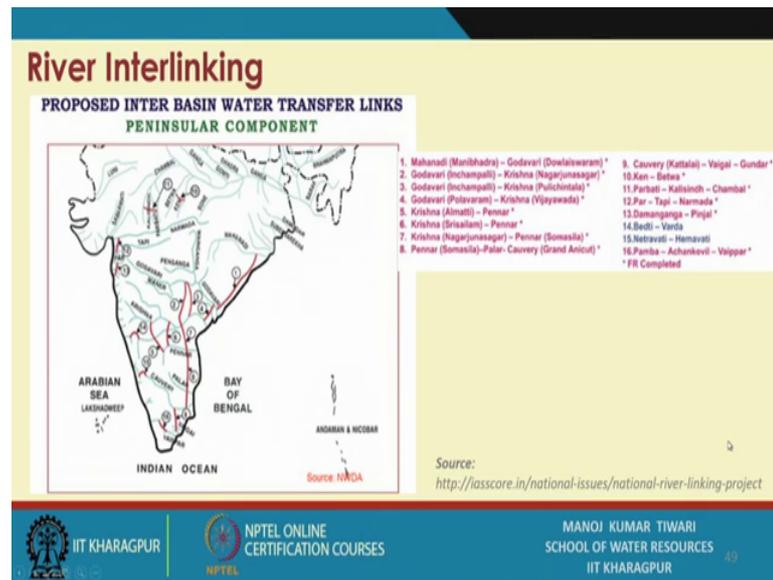
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So, those kind of things were taken care of. This is what you see here is the proposed inter basin water transfer links for Himalayan component where there are 14 such projects have been proposed, ok. So, these are the proposed linking of the rivers the red lines that you see over here. And these includes your kosi Ghagra Kosi Mochi Gandak Ganga Ghagra Yamuna Sarda Yamuna.

So, all these links are there, some connects 2 rivers some connects more than 2 rivers, ok. Like this Jogighopa Tista Farakka Farakka Sunderbans. So, all these link connections under the Himalayan component of the river interlinking project are there, the red ones that you see over here is actually the links for which the feasibility report has been completed, while there has been feasibility report under study or under preparation for various other links, some of these more would have been completed.

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This is the proposed links for peninsular components. So, there are again around 16 rivers 16 links which are to be put through. So, Mahanadi, Godavari Godavari, Krishna and then Godavari, Krishna, 2 3 different places Krishna Amaravati, Krishna, Pennar so, all these ken Betwa so, these like interlink projects are out there. And for most of them the feasibility report has been completed.

So, these are the sort of status of river interlinking project, although idea was to complete by 2014, but it has still not been completed while our the current government has basically allocated a large fund for this river interlinking project, and probably the serious efforts are been made in this direction.

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Water Cooperation with Neighbours

- Indus Waters Treaty (1960) between India and Pakistan led to the establishment of permanent Indus Committee and the division of the river and its tributaries between India and Pakistan.
- India shares four key rivers with Nepal—the Kosi, Gandaki, Karnali, and Mahakali, and is under agreement for water sharing of Kosi (first in 1954, revised in 1996), Mahakali (1996), Gandak Irrigation and Power Project Agreement (1964), and Upper Karnali Hydropower Project Memorandum of Understanding (2008).
- India-Bangladesh, Joint Rivers Commission (1972) look after the shared rivers between India and Bangladesh. Farakka Barage has the highest focus and both countries signed a treaty (1996) on this.
- There are no concrete watercourse agreements with China. However, In 2002, a memorandum of understanding was signed between China and India for sharing relevant information on transboundary rivers including Brahmaputra.

Source: India: Evolution of Water Law and Policy, by Cullet P. and Gupta J. in The Evolution of the Law and Politics of Water, Springer (2008)

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Further we have when we talk about interlinking rivers there are issues with the rivers which go cross country. So, water cooperation with neighbors in, if we see in India so, we are under Indus water treaty, between India and Pakistan. So, this leads to the establishment of permanent Indus committee, and the division of the river and its tributaries between India and Pakistan.

With Nepal India shares 4 key rivers so, kosi Gandaki then Karnali and Mahakali are the rivers, and it is under some sort of agreement for water sharing or for other projects for all these 4 rivers. Out of which kosi has been a sort of in some sort of dispute the water sharing agreement of the kosi with Nepal, claiming that they are not getting the adequate share of the water and India is getting the larger share; however, it has to be seen in a holistic approach like what is the population in the catchment of the river in India and what is the population in the catchment of the river in the Nepal. So, accordingly the divisions should be made.

Anyway, the agreement was for sharing water of the kosi was first established in 1954 it was further revised in 1996, Mahakali river water sharing agreement was also made in 1996 and largely there is no dispute on Mahakali. Few other rivers were in some sort of agreement or memorandum of understanding or mou for Gandak irrigation, and power project agreement which was done back in 1964, and more recently the upper karnali hydropower project memorandum of understanding was made in 2008. We have several

other issues with Nepal for water governance structure issues like the development of a barrage near Kharagpur. So, all those like things are there where joint operations are being done, with Bangladesh India actually shares some around 50 rivers; however, the major focus has been major attention has been given to the Farakka Barrage.

The India Bangladesh made a joint river commission in 1972 to look after this shared rivers between India and Bangladesh. The Farakka Barrage received the highest focus from both the countries, and they signed a treaty on this in 1996 for sharing water in the Farakka Barrage.

There are no concrete water course agreement with China although we share some of the water resources, and China being in the upstream India actually depends for water in some of the rivers from the China; however, in 2002 a memorandum of understanding was signed for sharing the relevant information on trans boundary rivers related to the water extraction, and all that including Brahmaputra which is one of the major river that connects India and China. But in general, there is no such particular treaty and this kind of concrete agreement is not there between India and China.

However, we should have one, because it is of very high importance. The China few years back proposed to make a dam, now if they make a dam in the upstream and withholds the water India is going to suffer a lot.

So, India should basically come forward in this and try to get into some sort of treaty with China over the sharing of waters in their trans boundary resources, this is a very high importance. Particularly, from because we are already on the verge of water stress and further stopping the flow in our rivers from the upstream will actually deteriorate the situation even more. So, we end this session over here, and we will discuss some of the other related issues in the last session of the week after this.

Thank you.