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An Analysis of the Interlinking of Rivers from the Perspective of Sustainable Development: A Comprehensive Investigation

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Abstract: ***Recently, policymakers have been pushing for rivers to connect with each other so that the country can grow. Many people support this idea because they think that connecting the rivers could solve many problems, such as water shortages, droughts, and floods. It could also help states make the best use of their water and share it fairly. But this very idea has been questioned and argued against by a wide range of people, from environmentalists to farmers. In fact, the idea of development through connecting rivers has been criticized and said to be against the idea of long-term growth. In the above claim and counterclaim, it comes down to picking a model of growth that not only makes a few people rich but also protects the environment. In this paper, the researcher wants to look at different types of literature, like court decisions, laws, policies, treaties, and more, in order to look at the problem of rivers connecting through the lens of sustainable development and find out how rivers connecting in India can help achieve the goal of sustainable development. Environmental impact assessment and social impact assessment will also be used in this study to look at the effects of connecting rivers.***

Keywords: Interlinking of Rivers, Sustainable Development, Environment, Farmers.

I. INTRODUCTION

"But the world's water problems don't have to be a source of tension; they can also bring people together. We can have a safe and long-lasting water future if we all work together."

Kofi Annan, 2002

Without a question, water is the world's most important natural resource. It keeps everything alive in a way that no other resource can. Concerns about water have been raised by the UN and the World Bank as the most important issue for people and the environment in the coming years. India needs to make a very clear water goal that will help us use the water resources we have to water farms, villages, cities, and factories all year long without hurting the environment. The whole country is facing more and more water stress in terms of time and space, as needs rise due to population growth, development, and environmental concerns. Large parts of the country are currently experiencing both serious flooding and drought, which makes it clear that the excess needs to be used wisely to offset the deficit.

The National Water Policy says that water is an important natural resource for people and, as a result, a valuable national commodity. Increasing population, farming and manufacturing, and pollution of water sources have made it hard to find rainwater these days. The world's population is projected to reach 7.9 billion by 2020, and there may not be enough fresh water for everyone. In the next few years, India is also likely to have trouble with water. Every year, the country gets about 4000 km^3 of rain, but because of different trends of rain and bad management, a lot of it is wasted. Because these Indian rivers flow into each other, a very big and bold project is being thought about.

II. Inter Linking of Rivers in India

The Interlinking of Rivers is the newest and most controversial plan to deal with the Indian problem. Before the British took over, this plan has been put forward by a number of engineers and government officials in different forms. Many people say that Sir Arthur Cotton was the first person to suggest such a plan more than 125 years ago, mainly to make trade easier. While this plan was never put into action, it was brought back to life by engineer and former irrigation minister K.L. Rao in the 1970s as the "National Water Grid."

The National Perspective for Water Development, developed by the Ministry of Water Resources in August 1980, serves as the foundation for the river connection project. The National Water Development Agency (NWDA) was founded in 1982 to conduct extensive research for the National Perspective. Late in 2002, the NWDA's plans got a lot of attention from the media after the Supreme Court of India said in a Public Interest Litigation that the government had to finish building the interlinking project by 2016. In response to this Supreme Court order, the Indian government set up a Task Force led by Mr. Suresh Prabhu.

Professionals in India who want to see sustainable development of water resources had to wake up to the facts and look into the technological and economic viability of this project, which is thought to be the biggest building project in the world. It is thought that the project's construction alone could cost between 125 and 200 billion US dollars. To this amount, add the costs for people, the environment, and running the business. This is true for all countries, no matter how big or small, whether they are developing or developed. Before investing in a project that costs a lot of money, they would do a lot of different, strict, and open studies to make sure it is technically and economically possible.

Sadly, and against what the professional thought would happen, there are no technical details of the interlinking project in the public domain. There are only a few lines on a map of the country that show roughly where the dams and canals are located. Other than those lines, there is nothing that the professional world can use to check the accuracy and reasonableness of the project's official claims of benefits, which are also not backed up by any data. On February 8, 2003, there was a public debate in New Delhi about the interlinking project. During the debate, Mr. Prabhu asked that all technical information about the project be made available to the public through the National Water Development Agency's (NWDA) website. There are 14 Peninsular Feasibility Reports online, but they don't have the technical details. Since there are no technical details about the project to connect Indian rivers, it is not possible to say for sure if NWDA's claims are true or not. However, it is hard to say no to a plan for the country to make such a big investment, which could also greatly change the country's water problems.

Recently, there has been more interest in the NWDA's plans to connect rivers. This should be understood in light of the Central Water Commission's (CWC) review of Dr. Rao and Captain Dastur's two previous plans. It was stated that Dr. Rao's idea was "grossly under-estimated" and that the plan "will also have no flood control benefits." This indicates that the "proposal was not pursued as such." The CWC and the experts who worked with them believed Captain Dastur's plan was "technically unsound and economically prohibitive" (MoWR, 2002). Since the current interlinking plan supports the idea of moving water from "surplus" basins to "deficit" basins, these projects also need to be looked at by professionals in a thorough and open way. This is the background against which this analysis is being done.

The National River Linking Project (NRLP) is India's big plan to move water from the northeast, where there is plenty of it, to the west and south, where there isn't enough. It will connect the areas that have too little water to the Ganges and the Brahmaputra rivers. The first part will have 16 links and be in the Himalayas. The second part will be in the peninsular area and have 14 links. It will bring together 37 rivers and hold 3,000 tons of water. A network of 14,900 kilometers of canals will transport 174 billion cubic meters of water. It claims to be the world's largest building project. It will cost US$120 billion (at the price in 2000), but it will benefit significantly by allowing 34 million hectares (MHa) of agricultural land to be irrigated (24 MHa surface water + 10 MHa ground water), producing 34,000 MW of hydropower, reducing flooding in the eastern region, and other benefits. The proposed project will force approximately 1.48 million people to relocate. The fact that the Supreme

Court of India told the Indian Government to move forward with the project within a certain time frame shows that the project is legal. Some people say that the Indian Government hasn't looked into other options in enough detail. However, the Indian Government says that the NRLP is the only option because of how bad the crisis is. People who are against the enterprise and people who are for it both think that India will be doomed whether the NRLP is put into place or not. There are a lot of claims and opinions about the project, but not many well-thought-out analyses.

III. Impact of Inter Linking Rivers

A study was finished and turned in in 2013 that looked into whether it would be possible to connect India's rivers. The report also talked about how much money will need to be spent and how much money will be made from it. The length of the link between the River Tapi and the River Narmada will be about 400 km. This will allow for the production of 93 MW more electricity, the supply of 91 MCM of water for drinking and industrial use, and the irrigation of an extra 169,000 hectares. The cost of connecting the two rivers, based on an estimate from 2003, is Rs. 6,016 crore, despite the benefits.

IV. Benefits of Inter Linking of Rivers

Food Security:

Today, there are about 1100 million people living in India. By 2050, that number is forecast to stay stable at about 1600 million. From now until 2050, this extra people will need 460 million tons of food, up from 260 million tons now. With the planned river link, the land that is watered will grow from 113 million hectares now to 156 million hectares by 2050. This will make sure that we have enough food.

Hydropower Development:

Because we have only developed about 28,000 MW of hydropower out of a potential of about 84,000 MW, it only makes up about 25% of all the power we make right now. About 45% of the country's hydropower potential is in the northeast, but only 2% of that potential has been used so far. As part of the proposed grid, especially the Himalayan part, 34,000 MW of extra hydropower will be added for peaking needs and to reach the goal of 40% hydropower as a source of water for drinking and industry. The planned NPP will provide 90 billion cum of clean drinking water and 64.8 billion cum of water for industrial use, so that the demand can be met by 2050. This will make things easier, especially for rural women who have to walk a long way every day to get water for drinking and other uses around the house. Without a guaranteed water supply, there can be no industrial growth.

Navigation for Inland Water Transport:

This is because the rivers aren't deep enough—they need to be at least 2 meters deep—so the national waterways can only be used for about 120 days a year. With National Waterways (I), II, and III, the proposed grid will make it easier for people to travel by rail and road by guaranteeing a minimum 2 m depth of water every day of the year.

Flood and Drought Protection:

It has already been said that one part of the country is devastated by frequent floods, while another part is suffering from drought because there is not enough water. How can the water that destroys and dumps trash into the sea (mainly from the Brahmaputra, Ganga, and Mahanadi Basins) be redirected to areas in the south and west that are prone to drought be put to productive use? This would help the country get rid of its current flood-drought-flood syndrome.

Increased Employment Opportunities in Rural Area:

People who used to live in rural areas have to move to cities to find work, which is quickly hurting our national economy. Villages are getting poorer and cities are getting busier, which is polluting the air, water, and soil in cities in ways that have never been seen before. Putting more jobs in rural areas through agricultural and agro-industry-based projects is the only way to

stop this bad trend. Since most of the proposed link canals and storages will be in rural areas, it will create a lot of jobs for young people in those areas.

Dry Weather Flow Augmentation:

Moving extra water stored in reservoirs during the monsoon season and letting it out during the dry season will keep the flow of dry weather in rivers to a minimum. This will help with things like preventing pollution, navigation, fishing, forest growth, animal protection, and more. Any body of water, whether it's in a storage reservoir or a flowing link canal, will be very appealing and give people from both cities and rural areas a chance to have fun.

Expansion of Irrigation:

The project says it will add 35 million hectares (m ha) of irrigation to the dry western and peninsular regions. This will be done by using 25 million hectares of surface irrigation and 10 million hectares of groundwater. This will make even more jobs available, increase crop yields and farm incomes, and spread the benefits through backward (farm equipment and input supplies) and forward (agro-processing industries). Besides this, the project should also make navigation and fishing better in a number of ways. In India, the needs of agriculture are always growing because the population is growing. India uses a lot of water for irrigation—nearly 83% of all water used in the country, compared to the average of 69% around the world. There will be 450 million tons of food grains, though, for the 1.5 to 1.8 billion people who will be alive in 2050. India needs to increase the area that can be irrigated to 160 million hectares. Because of this, plans like moving water between basins are needed.

V. Problem of Interlinking of Rovers

Economic Issue:

The project will cost approximately US$ 112 billion over the first ten years. This amount is equivalent to about a quarter of India's annual GDP and 250% of all tax revenue collected in 2002. If there is a delay, the cost will increase. The MOWR has already stated that the project can be completed in 35 years but may cost up to $200 billion. According to reports, some of India's previous large-scale water development projects exceeded budget by 5 to 893%. Also, even the most optimistic estimates say that finishing the country's current irrigation projects will cost more than US$800 billion. Many of these projects are stuck because they don't have enough money. There aren't even enough resources to keep up with the irrigation that's already in place. External lending could make the current situation with external debt worse, so the government has flatly refused to accept any external funding for the project. Instead, it has asked businesses to support the effort, which could lead to private sector investment in managing India's water resources, which could mean that people lose even more of their traditional rights over water resources.

Resettlement and Rehabilitation:

It's been hard to talk about how useful water resources projects are because of the problems with helping people who have been forced to move because of dams. These problems have also hurt the economy and the health of the whole population. The Central Water Commission looked at data from 2,784 dams in 14 states and came to the conclusion that between 6 and 7 million people may have been affected. People who are against big dams say this number is 70 million times higher than it really is. They get this number by taking the average of the last few megadams and multiplying it by 4,291. It is very important to set up a strong monitoring group to help rehabilitate project-affected families (PAFs). To solve this problem, we need to make people aware of it and use persuasion. At the same time, rehabilitation packages that offer more than one choice should be made more appealing so that people who were affected by the project will choose to take them.

Ecological Issues:

Several environmental problems have been linked to rivers that flow into each other. Along the Suez Canal, which connects the Red Sea to the Mediterranean, some fish species that came from the Red Sea made their way to the eastern

Mediterranean. In this case, the fish species that lived there before were moved. No one knows what kinds of risks there are for transmigration when rivers connect. Many endangered species lived in the Panna Tiger Reserve in Madhya Pradesh, India. When the Ken and Betwa rivers were linked, they were expected to flood an important wildlife habitat. Another problem was noise pollution and the movement of diesel vehicles, both of which were bad for the forest's ecosystem. Even in the summer, the river has to flow and reach the sea. It is important to think about the fish that breed in the river and the people who depend on them. How could we forget the most important part, which is taking care of the river's animal needs? Experts say that India's rivers aren't getting to the sea, which hurts their ecological functions. Fisheries along the coast and in the ocean are affected, as well as rivers, which bring in fifth. Whether it's connecting rivers, collecting rainwater, building dams, or planting trees, anything that people do on this scale changes the ecosystem from its natural state. A thorough analysis of the costs and benefits for people, the environment, and the economy must be used to make these choices.

Sustainable Development:

When the Barcelona Declaration on Environment and Development was made in the early 1970s, the phrase "sustainable development" was used. Sustainability was a new idea when the Brundtland Commission's report on the World Commission on Environment and Development came out in 1987. The idea turned out to be one of the most successful new ideas in a long time. In fact, it helped to shape the international agenda and how people around the world think about developing economies, societies, and the environment. In its report, the Brundtland Commission said that sustainable development is "development that meets the needs of current generations without making it harder for future generations to meet their own needs." Strong economic and social growth is backed by the idea, especially for people with low living standards. At the same time, it shows how important it is to safeguard the environment and natural resources. It is not possible to improve economic and social well-being by taking actions that hurt the environment. Solidarity between generations is also very important. Any development must think about how it will affect the chances of future generations. We can't just destroy the environment to help the economy grow, and we can't just stop growth to protect the environment. To protect the environment and help the economy grow, there should be a balance. The project to connect rivers will definitely have a lot of effects on the environment, but it will also be good for people.

VI. Conclusion

While undertaking the ambitious project of interlinking rivers the government will also have to consider the environment impact of the project as while water is being channelised towards a particular region what if it causes water logging or salinisation of area. Where to settle large number of people who will get displaced due to interlinking of rivers is a one issue that needs great consideration. Also this project will have impact on marine life and thereby make numerous fishermen jobless. The government will have to first figure out how to gainfully employ such fishermen. There is also one big problem to the project of Inter-state relations because if there are not good relations between the two or more states then it will be very difficult to implement the project of interlinking of rivers. So first of all, the Central government has to take all the state governments into confidence to implement the dream project of Interlinking of rivers.

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