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# The Hydro-political History of the first Indo-Nepal Koshi River Agreement (1954)

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***ABSTRACT :***
*The cordial bilateral relation between India & Nepal dates from time immemorial. In recent times, a formal Treaty of Peace & Friendship was signed between Nepal & the then British India back in 1815. It was subsequently revised after Independence in 1950. Being two inherent neighbors, India & Nepal shares a large number of things between each other, not only in socio-political sphere but also in Geographical & Natural context. One such is the Hydrological resources particularly, the Himalayan River system. In this context we come across the Sapta Koshi River system. The Koshi, is the largest River of Nepal which originates in Tibet, then drain across Nepal and enters India near the Hanumangarh district in Bihar. 20 kms farther downstream, it joins River Ganga. It drains an area of 41,333 sq Km. in Nepal & that of about 20,400 sq. Km in India. The river is noted for its devastating effects of flood & soil erosion. Almost each & every year it used to cause massive destruction & loss of life & property, particularly in Bihar. Due to such devastative effects, it was sometimes called the "Sorrow of Bihar". Considering such devastative nature, a scheme to check the river, to build a barrage on its course, became an utmost necessity. Here begins the Indo-Nepal Hydro-political negotiations centering the Koshi River System. In fact, historically the idea of controlling the Koshi was in discussion as early as 1897 in British India. The idea was repeatedly put forward many a times since then. However, due to various bilateral & political reasons it couldn't be materialized. But then in the 1950s with some new changes in the political spectrum, the idea suddenly gained momentum & finally the first Indo-Nepal Koshi Agreement was signed in 1954. So, what made it possible? & why did it happen first of all? In this context, our following article would briefly attempt to evaluate & analyze about the possible factors that led to the formulation of the long pending Koshi Agreement between India & Nepal back in 1954.*

***KEYWORDS :*** *Sapta Koshi, catchment area, River basin, Upper Riparian, Lower Riparian, barrage, irrigation, flood control, Glacial Lake outburst flood, river basin, Rana Oligarchy.*

# RESEARCH PAPER

## Introduction :

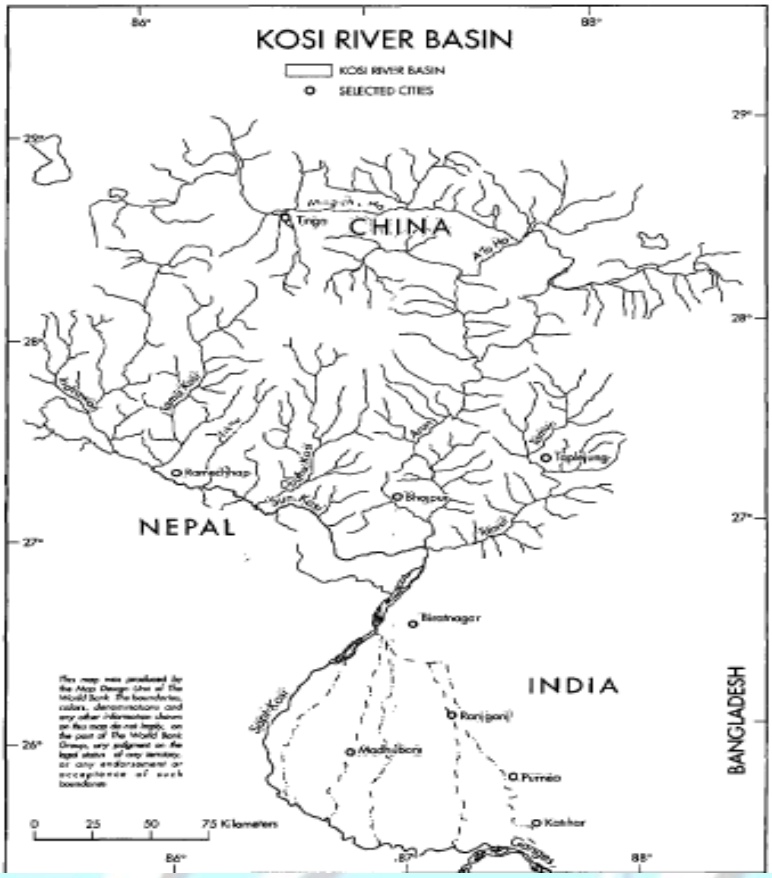
"We make our friends, we can make enemies of our own, but it is God who makes our next door neighbor"
~ Gilbert K. Chesterton
Indeed, one can change his friend or enemy but can never change one's neighbor. In these days of mutual mistrust & increasing threat of violence, a good relation with your neighbor is an indispensable need of the time. In this regard, India is fortunate enough to have the beautiful country of Nepal as her Northern neighbor. The Indo-Nepalese relation dates back to time immemorial. Since the beginning of 19th century, the relation advanced with a larger space. In addition, ever since the post 1947 period, it received a major impetus. Although it witnessed occasional challenges & upheavals, but overall the relation is much cordial which resulted in a series of mutual co-operational act within a short span of time.
In such a context, April 1954, added a landmark in the history of Indo-Nepal Hydro-political cooperation when the famous Koshi River agreement was signed. Now, Nepal being the northern neighbor of India, also forms the major supplier of numerous perennial river system to the Northern Gangetic plains. Each year they brought million gallons of water to the River Ganga. One such major river system was the Koshi River in Eastern Nepal. But, apart from being a supplier of water it also have another characteristic. Due to its extreme denudating nature it occasionally causes havoc floods on both sides of its banks resulting in massive destruction of life property and agriculture in both Nepal & India. Due to its extreme calamatic impact in the lower riparian Indian state of Bihar, the river is popularly known as "the sorrow of Bihar".
Thus, an efficient project to check the denudating tendency of the Koshi River and protect millions of people from flood, became the need of the day. In this section, we will analyze the history of Hydro-political cooperation between India & Nepal centering the Koshi River.

## An Environmental survey for the Causes & Impact :

Originating in Tibet at an altitude of about 6000 m. above sea level, the Koshi River forms the largest River system of Nepal. As the river enters Nepal from Tibet, it flows in a South Easterly direction up to the Tribeni Confluence, where it meets with its two other tributaries viz. River Arun & River Tamur at Chatra. Now it is called Sapta Koshi River, which flows South & enters India through the state of Bihar near Bhimnagar area. 20 km farther downstream, it joins the Ganges near Khursela in Bihar, forming one of its largest tributaries in Eastern India.[1] The Koshi River system drains a total area of 92,538 sq. km of which 41,333 sq. km. falls in Nepal and 20,405 in India while the rest falls in Tibet. [2]
However, as we have mentioned earlier, the Koshi is mainly notable for its devastating effects. Almost each consecutive year it used to overflow its banks and caused massive floods & destruction on its both sides. So an important question comes to the mind that what exactly is causing this sort of flooding behavior of the River ?
Now, the Koshi River basin witness mainly two broad categories of flood ~

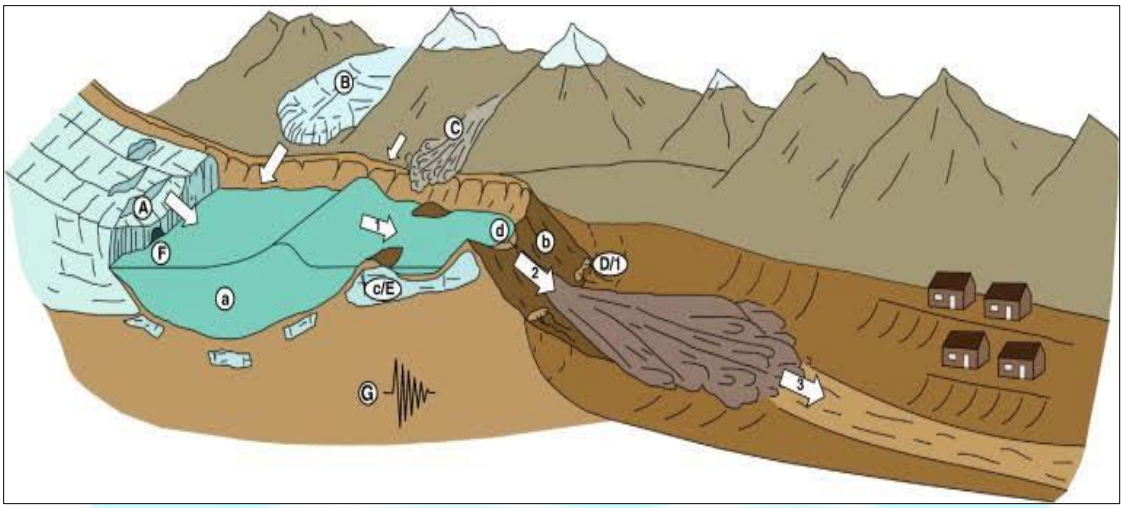
i) Glacial outburst Flood
ii) Flash Floods due to torrential rain / cloud burst

Among these, the floods due to Glacial Lake outburst had become the most active cause of devastation particularly in this River system. The last example of such kind of natural hazard was the devastative Kumbhu Himal Flood in Eastern Nepal (1985).[3]




The Koshi River Basin (Source : Salman & Uprety, *Conflict & Cooperation*)

Now Glacial Lakes are common features at an altitude of 4500-500 meters above sea level in Nepalese Himalayan River systems. The Koshi Basin in this regard, along with some of its Northern high Himalayan feeder tributaries, has some of the largest Glacial Lakes in this region. Among them, the Glacial Lake of Tso Rolpha & Imja Glacier deserve special mention.
Such lakes are generally found behind the moraine dams on the surface of Glaciers in a side valley. Now, as several reports suggests, due to increasing global warming, since the last century, these glaciers started retreating at a rapid space. Thus as the ice melts huge basins are created in the empty space between the retreating glacier on one hand & the existing moraine on the other. These newly created empty basins are quickly filled up by waters from the melting ice along with mountain debris, creating some sort of a pond like thing held by a moraine dam. More the Glaciers retreat, more do these ponds enlarge. As a result, the water volume in these lakes increases subsequently. In the Koshi River system this dangerous trend was reported from several of its Glacial lakes. E.g. From 1959-1972 the surface area of Tso Ralpha's Ice melted pond increased from 0.23 sq km. to almost triple i.e. about 0.62 sq km, while that of Imja Glacier Lake increased by 0.5 sq. Km.[4]




A graphical representation of Glacial Lake outburst flood

[Index : A = Mouth of the Retreating Glacier, F= The newly formed lake in the left away space of the glacier comprised of Ice melted water, 2 = Glacial Lake outburst flood]

With increasing Global warming, as more of amount of ice melted water concentrates over decades, the volume of these moraine ponds expands rapidly. As it reaches its saturation point, it can no longer hold any farther water pressure and thus eventually burst out causing devastating floods in its downstream. Rock fall, avalanches, earthquakes, etc might be some of the instant factors responsible for such burst outs. As a result, millions of cubic liters of water might be discharged within few hours. One can easily imagine what horrific devastation can such an incident result in. In recent times, one such tumultuous example can be given of the 2013 Kedarnath Flood caused due to the Glacial outburst of Gandhi Sarovar & subsequent overflow of Mandakini River.

The greatest threats of outburst are however in the summer-monsoon season due to a joint deposition of water by the melting of Glacial ice & heavy monsoon rainfall, both at the same time. In fact, all the known outburst floods in the Koshi River system mainly occurred in the months of July, August & September. Mention can be made of the massive Imja Valley & Indrawati Valley outburst in 1956. It wiped away the homes of almost 40,000 people. The terrific Bihar Flood of 1954 is another such example that in fact however made the Koshi River Project, an urgent need of the day. Between 1935 to 1970 almost seven massive Glacial outburst flood occurred in the Koshi River system.[5]

In addition, another great problem of this river is its constant shifting habit. Reports suggests that the Koshi river which rises in Tibet & then flows over Nepal & India up to its confluence in Ganga, within the last 150 years, had moved 70 miles Westwards. As a result 8000 sq miles of land was laid waste. This is because of excessive silt contain in the River. The silts start depositing as soon as the river enters the flood plains. It chocks the flow of the river in its normal channel and thereby forces the water to cut altogether new channels.[6] This led the river to shift farther westward, causing even more devastation in its flood plains.

However, it was not only India alone that suffered from the unruly Koshi Floods, but about 300-500 sq. miles of Nepalese territories too used to be devastated by the floods of Koshi River. In Bihar although, the area prone to over flooding is five to six times larger compared to that of Nepal. [7]

These calamities cannot be averted by mere localized flood protection methods or relief measures. But a more serious & effective project to control the river was necessary that would prevent the devastative floods and also led to the proper harnessing of river water in irrigation & hydro-electric power generation, at the same time.

**The Early Historical perspective : the Colonial stalemate** :

"The relationship in water resources between the two countries i.e. Nepal & India, exist at both people to people and at official levels. While, the former existed since time immemorial, the latter, based on available records dates back by over 100 years."
~ Dwarika Nath Dhungel.[8]

Official documents suggest that the efforts to tame the Koshi River had started since the early Colonial era. As early as 1779, East India Company (EIC) official, Major Rennel took into notice the constant shifting behavior of the Koshi River.[9] He was probably the first to take this into account and immediately reported this to his higher authority. But for some reason or other, the EIC didn't take the matter seriously.

However, as the political power shifted from the company to the hands of the British Crown, by 1858, again the matter came into official consideration. The new government focused on a more detailed and accurate study of the colonial lands, be it in the field of anthropology, geography or the history of the country. The regular organizing of the grand Imperial census, every after 10 years, since 1871, was one such classic outcome of this new Governmental policy. Now, the districts of Bihar (at that time, a part of undivided Bengal province), formed an important revenue supplier for the government. Occasional floods of the Koshi River obviously hampered such colonial interest. This led the British government to undertake some detail survey of the River system.

By 1863, two other individual field analysis was done by British officers. Meanwhile, in 1868, British Geologist FA Shilling Field was given the responsibility by the British Indian government to study detail geomorphologic discourse of the River. After a detailed observation of 25 years, Shilling Field finally submitted the Oscillation report of the Koshi, to the Government in 1893. He for the first time confirmed the shifting nature of the Koshi and observed that the bed of river dangerously oscillates over a vast tract of land "from the Brahmaputra to near the mouth of the Gandak". [10]

Thus by 1900, the devastative nature of the Koshi was attracting considerable attention to the British Indian Government. However, as to D.N. Dhungel, it was just an initial stage of recognition. The British had hardly any plans to construct any grand water management project over the Koshi River. Their only plan of measure was to construct an effective embankment all through the 20 miles course, to check the constant oscillation and shifting of the river course.[11]

Although such a plan seems to be no less a grand project, considering the historical timeline, yet his observation seems to be contradictory a little bit. For, evidences suggest that during the tenure of Prime Minister, Bir Shumsher Jung Bahdur Rana (1885-1901 CE) of Nepal, the British Indian Government had requested for a permission to build up a water barrage over the Koshi River somewhere near the Chatra area of Nepal. It is also discovered that, in reply to this in a telegraphic message, PM Jung Bahadur Rana, had indirectly given his acceptance for the project on February 27, 1897. He even indicated in his official circles of Kathmandu that he is willing to supply food to the construction laborers. Thus as early as the last decade of 19$^{th}$ century construction of a grand water management project for the Koshi River was already in the official

consideration along with a grand scheme in three water Lakes in Palhimajkhanda area.[12] But for some unexpected reasons this project failed to materialize unfortunately.

Finally, in 1941, Sir CC Inglish, Director of the Central Water & Hydro Dynamics Research Station, (CWHDRS), Poona, identified that the actual problem of Koshi was the excess discharge of sand in the River. This in turn is related to massive glacial lake outbursts were also confirmed by this report.[13] This report gave the final warning, that to build a grand water barrage is the only ultimate solution to check the destructive effects of the Koshi Floods. But still no such plans could be executed by British Indian Government. One might argue that the horrors and impact of the ongoing World War II was an important factor behind the delay of such a project. It might be. We don't have any specific evidence to deny that. But that was not however, the sole responsible.

Thus one could genuinely be curious about why India & Nepal took so many years to materialize the Koshi project, when the detail studies were already complete and plans were already arising since latter half of 19$^{th}$ century ? Why can't Koshi agreement be materialized by in the colonial times like that of the Sharada project of Mahakali river in 1920 ? The obvious reason for that was some sort of indirect mutual-distrust between the two powers. Although it is certain that the princely state of Nepal always remained a most trustworthy Northern ally of the British Paramountcy, but yet there remained a sense of extreme mutual cautiousness between the two in their diplomatic relations. For Mr. K D Adhikary, former water resource secretary & the Nepalese ambassador to India, confirmed in an interview that the then Nepalese rulers considered each & every Co-lateral Water management projects equivalent to the highest foreign policy agreements. Thus, they wanted to take each steps in this regard too cautiously. Again, ever since the Sharada Barrage project, the Nepalese side had under-grown a feeling that every such project means a loss of Nepalese land and that a small country like Nepal can never compromise for such a loss, however minute it be, while granting permission for the Constructions of such barrages.[14] As a matter of fact, indeed there remained various boundary disputes between the two countries in Eastern Nepal, which were yet to be settled bilaterally.[15]

Thus in the negotiation tables, rather than giving prime focus for securing water supply for Nepal's irrigation, the Nepalese delegates were more eager to negotiate for land in exchange. The British government on the other hand, was also too rigid for such negotiations. Although being about 100 times larger than Nepal, the Imperial government never considered for giving any such lands of its jurisdiction in exchange. As a result of all these, the ultimate outcome however, was that the Koshi project failed to materialize in pre-Independence Era.

**The Post-colonial Era : The final culmination of the agreement** :

With the independence of India in 1947, a new urgency for a Hydro-political Cooperation regarding the Koshi river started gaining ground in a rapid space. Several factors were responsible behind this.

In the Nepalese context, the Rana Oligarchy of Nepal, the hereditary ruler ship of the Rana premiers (1846-1951), was fast losing its popularity. The democratic unrest finally toppled the Rana regime in 1951. A new Monarchial form of Government with King Tribhuvan (1911-55) as the head of state supported by the democratic alliance of Nepali Congress was established. This new pro-democratic government of Nepal was more enthusiast to heightened the cooperative relation between Nepal & the new Independent Government of India.

On the part of India, the new independent government was obviously more emotionally serious to find a solution for its citizens than it's former foreign masters. Diplomatically too, there

emerged enough reasons for India to immediately settle for more cooperative bilateral agreements with her Northern neighbor of Nepal. For it is during this time in 1950 that Communist China invaded Tibet. As a result, it prompted India to sought for immediate counterbalance of power to secure its northern borders by asserting a more stronger diplomatic relation with Nepal through bilateral ties.

Thus, post colonial era gave a major boost in the Hydro political cooperation between the two countries. Reports suggest that already at the close quarters of the end of British rule, when India was being administered by an Interim Government, joint extensive surveys & field studies were realloted. One of such was the team of A.N. Khosla, chairperson of Central Waterways, Irrigation & navigation Commission appointed on 23rd January, 1946. Lt. Colonel Narmardan Thapa (Chief Engineer, Chandra Canal) & Pt. B.N. Sharma of the PWD department represented Nepal in this team. Earlier in the post WWII eras, as building a barrage in Koshi cannot be materialized, the British Indian Government had thought of constructing a mere 2 miles embankment in the Koshi river to stop its meandering nature. But Khosla committee after a comprehensive survey reaffirmed that building a high dam over the Koshi at the Chatra gorge, is the only possible solution to prevent the devastative floods.[16] Any other alternatives would be completely unsatisfactory. All these made the construction of a dam indispensable.

When such negation for the project was gaining ground, a serious calamity occurred. In August 1954, the most destructive flood occurred in the Koshi. It was the largest ever recorded with the water flow rising up to 27,014 $m^3$/sec. in August.[17] It resulted in a massive destruction of life & property in Bihar. Pt. Nehru who visited the affected area, felt the urgency of the project & immediately declared certain concrete measures should be taken to woo the sufferings of the masses.[18]

The horrific calamity of 1954, gave the final call of urgency. Thus, after much trials & tribulations the Koshi River agreement was signed between India & Nepal in 1954.

In this connection, a 1,150-meter barrage was built in Bhimnagar, *5* km upstream of Hanuman Nagar (8 km inside Nepal). The barrage is intended to serve as a gradient control measure for containing the meandering behavior of the river. Two canals take off from either side of the barrage. The Eastern Main Canal, which is entirely in the Indian Territory, provides irrigation to 612,500 hectares of agricultural land in India." A power-house with an installed capacity of four units of 5,000 kW each is located along the canal at a distance of II km from the barrage and generates power by making use of the head drop of the canal.[19] 50% of the total power generated is entitled for Nepal at a stipulated rate.

The Western Main Canal traverses a distance of 35 km in Nepal before entering the Indian Territory, and provides irrigation water to 11,300 hectares of agricultural land in Nepal. Flood control works in Nepal consist of a western afflux bund about 2 km long and a 40-km embankment along the eastern bank of the river to stop its meandering nature.[20]

The estimated cost of the Project was Rs. 45.0 crores, but because of siltation problems and the shifting nature of the Koshi River, additional works were required that raised the cost to 54.5 crores. As to the agreement, this entire cost was supplied by India. The barrage and the Eastern Main Canal were completed in 1962. The construction of the Western Main Canal started in 1972 and it became operational in 1982.[21]

However due to serious difference of opinion on the both sides, the treaty was finally revised in 1966 between PM Lal Bahadur Sashtri & Maharaja Mahendra.

**Conclusion** :

Thus, the waterpower resource has two facades – if it is left untamed it might cause some of the most devastative floods & natural calamities in the sub-continent, but if it is harnessed properly, it might for a great water power potential facilitating economic development through means like irrigation or hydro-electric power generation. The Koshi River is an ideal case for this statement.

In our above article, we have discussed what are the possible causative factors behind the devastative nature of Koshi River. We have shown how the increasing temperature of the Earth makes the Glaciers to recede and thereby forms one of the most important factors behind glacial outburst floods in the Koshi.

In the context of hydro-political cooperation in Koshi River basin we can conclude that a pseudo-mistrust between the British Indian Government and a rigidity of policy on both side had resulted in a temporary stalemate. However the post independent era opened more cooperative trends of negotiations on the part of both the countries. Mutual diplomatic urgencies coupled by a more emotional attachment to the cause led to the final culmination of the Koshi River agreement (1954).

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