HEINRICH BÖLL STIFTUNG
INDIA

Mahanadi: Looking beyond coal

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Abstract

Mahanadi, India's sixth largest river, is undergoing a storm at the moment. Major riparian states – Odisha and Chhattisgarh – have locked horns over sharing of water from this already decaying water resource that supports more than 40 million people. Fought under purview of the Interstate River Water Disputes Act, the prime focus is on sharing the remaining water in the river. However, real issues such as climate change, coal mining and thermal power plants that cause lot of stress for the river and distress for local riparian communities, may not be solved by this. This article tries to put such issues in perspective and suggests measures to ensure the right of the river to survive and stay healthy as well as to bring the local communities on board for proper management of the basin.

Author's profile

Ranjan K Panda, a Master in Sociology, has nearly three decades of experience in leading several water and environmental initiatives in India. A known water and climate expert of India, he convenes many advocacy networks and writes for various publications. He has been delivering lectures in seminars, workshops and universities all across the globe, and leading several campaigns for conservation of rivers, water bodies and forests. His areas of interests have been water, environment, climate change/ justice issues in both rural and urban areas. He is a strong advocate of community centric governance of natural resources for sustainable development. In 2010, he was awarded with the first “Green Hero” by NDTV which was given away by the President of India. He has been recognised as Mahanadi River Waterkeeper by the New York based global ‘Waterkeeper Alliance’.

Mahanadi: Looking beyond coal

When we approached the Tilia village, on the bank of a huge 743 square kilometres reservoir of Hirakud Dam in Odisha's Jharsuguda district on a terribly hot day of May 2017, boiling at somewhere above 45 degrees Centigrade, most of the women and children of the village were seen queuing up at a water tanker to fetch drinking water for their families. These villagers, living inside one of India's industrial pockets, dare the summer, winter and rains – 365 days a year – to fetch water from tankers. Development has arrived to the area through roads and chimneys (aluminium smelters, coal fired power plants, etc.), but safe drinking and irrigation waters are still a far cry. People depend on these water tankers provided by nearby industries and mining companies. When the tankers do not arrive, and which is for almost more than a half of the days in a year – as the villagers say – they have to depend on nearby ponds, wells, bore wells, all of which are getting drier by the year. Access to safe drinking water that is supposed to be their 'right' and was to be delivered at their homes, is provided as a matter of 'mercy' by the miners, power plant companies and other industrial houses who have taken away people's land, water and forests in the name of development.

Conflict around colonisation of water

The Hirakud Dam, built in the 1950s, happens to be the first multi-purpose mega dam project of Independent India, which the first Prime Minister of India described as a 'modern temple'. At that time, it was known as the longest earthen dam of the world and had the largest spread of artificial lake in the Asia continent. The dam was built as a National Project and was enjoying that status for a few years, after it was handed over to the state of Odisha. The dam is located at latitude 21.31 degrees north and longitude 83.52 degrees east across the Mahanadi, about 15 km upstream of Sambalpur town. With a submergence area of 743 square kilometres, the reservoir submerged 1,23,303 acres of cultivable land and displaced 22,144 families officially. Unofficial sources dispute the displaced family statistics of the government and say it is much more. At least 3,540 of the officially recognised displaced families are yet to be compensated even 50 years after their displacement (Panda 2007). But other figures put it at 9,913 families[1]. The dam had become functional in 1957. Speaking to the displaced people of the Hirakud Dam, Pandit Jawaharlal Nehru had famously said: "If you are to suffer, you should suffer in the interest of the country."

[1] https://timesofindia.indiatimes.com/city/bhubaneswar/Hirakud-displaced-families-await-compensation/articleshow/7810754.cms

Hirakud Dam, Odisha, India. Photo by Ranjan K Panda

Tilia villagers gave away their land for this dam as it colonised water for irrigation and other benefits in other areas, and are still struggling to get their share of water. Rather, they have been struggling to retain the remaining land and water bodies as the Odisha Power Generation Corporation Limited (OPGC) wants to expand its coal fired power plant in the area and wants their farm lands and water bodies for constructing fly ash ponds. The villagers are now fighting almost a losing battle against the OPGC and for survival with dignity. Same is the case in hundreds of villages in and around Hirakud, in the coalfield areas of both Odisha and Chhattisgarh, as both the states are planning to be the coal fired power hubs of India.

The Hirakud Dam has been at the root of a water conflict between both these major riparian states of the Mahanadi river. It has colonised water to attract numerous industries and power plants. Odisha, the lower riparian state of the river, has offered Hirakud water to industries alluring them to come and invest here. Now, as Chhattisgarh has constructed several dams and barrages upstream of Hirakud to do the same, Odisha is complaining about drastic reduction of water flow into the Hirakud Dam that would impact its development plans and communities. Odisha has filed a complaint at a Tribunal[2] that has been set up

[2] http://www.newindianexpress.com/states/odisha/2018/mar/13/centre-forms-tribunal-to-resolve-mahanadi-issue-1786184.html

under the Interstate River Water Disputes Act (ISRWD Act) of 1956, and the matter is now being heard.

For the villagers of Tilia, Hirakud water has been like an oasis in a desert for all these seven decades and this fight does not change their fate. Forget about water in Hirakud, their right on the river water is non-existent.

Tilia village women carrying drinking water, Odisha, India. Photo by Ranjan K Panda

Odisha's fight against Chhattisgarh that officially and politically started in July 2016 basically is centred on six barrages that Chhattisgarh was building upstream without consulting them. The Odisha government has alleged that the central government has been favouring the upper riparian state in this alleged illegal act, and has wanted an immediate halt to all such constructions and do an assessment of their impact on the Mahanadi flow that, according to Odisha, has already reduced a lot over the decades. "The annual flow of water in the Mahanadi in Odisha is 20 million cubic feet and if water is intercepted for storage by the upstream state, the flow will fall sharply," the state's engineer-in-chief had said then[3], at the time when the conflict started, and he was asked to investigate into Chhattisgarh's illegalities. While 53.1 per cent of the Mahanadi's entire catchment area falls in Chhattisgarh, for the Hirakud Dam reservoir it is almost 90 per cent. That is the reason why the Hirakud Dam is

3 https://timesofindia.indiatimes.com/city/bhubaneswar/Cgarh-drawing-water-from-Mahanadi-without-state-nod/articleshow/53018795.cms

completely dependent on the release of water from Chhattisgarh. Catchment area of the dam inside Odisha is only about 9.4 per cent.

The original Hirakud Dam project report envisaged that irrigation and power production would require 12.28 million acre feet (MAF) of water that includes reservoir losses (see table 1). Of this, 4.10 MAF was supposed to be derived from storage and the balance from the normal flow of the river. The minimum run off of the Mahanadi at that point was 20.61 MAF as per the following table.

Sl.No.	**Details**	**Contemplated in DPR 1947**
1	Irrigation including lift	3,628 (2.94 MAF)
2	Power	10,785 (8.74 MAF)
3	Evaporation	740 (0.60 MAF)
4	Domestic	-
5	Industries	-
Total		12.28 MAF

Table 1: Quantification of Commitments of Hirakud Dam (Contemplated in 1947)

The project architects had made an allocation of 12.28 MAF for the Hirakud Dam leaving 8.33 MAF for use by upstream states. The dam was originally conceived as a flood control reservoir to mitigate flood in the downstream delta. Apart from flood control, Odisha's requirement for water for irrigation, power, domestic and industrial use stands at 18,175 million cubic metre (MCM) (see table 2).

Sl. No	**Details**	**Planned Utilisation (MCM)**
1	Irrigation including lift	5,722
2	Power	10,222
3	Domestic	134
4	Industries	1,415
Total		18,175*

Table 2: Planned Utilisation of Water from Hirakud Dam

**This is excluding the environmental flow requirements, which are assessed to be about 9,621 MCM "*

The non-monsoon commitment from the Hirakud Dam stands at 6,308 MCM, which is set to increase to 8,179 MCM due to commitments already made by Odisha, as shown in table 3.

Sl. No.	Details	Present Scenario	Commitments
1	Irrigation including lift	1,390	2,804
2	Power	4,077	4,077
3	Evaporation	395	395
4	Domestic	14	78
5	Industries	432	825
Total		6,308*	8,179*

Table 3: Commitment of Hirakud Dam During Non-Monsoon (unit: MCM)

**This excludes requirement for downstream environmental flow[4].*

Odisha claims that there has been a constant downward trend of water availability in the Hirakud reservoir from 1990-91 onwards. Going by inflow versus demand at Hirakud (non-monsoon actual) the water availability seems to have gone down from a little less than 8,000 MCM to a little more than 5,000 MCM[5]. That is really a scary situation.

Odisha apprehends that when all the contentious barrages in Chhattisgarh start operating in tandem, the Mahanadi will be converted to an elongated pool, with storage potential of just 829 MCM of water during non-monsoon period. These barrages may actually reduce the non-monsoon flow in a normal year to the tune of 1,074 MCM and can also arrest base flow during weak monsoon years.

The Odisha government's apprehensions seem to be right and justified as the author found out from an independent analysis done for his study (Panda 2018), during field visits to these dam sites and discussions with people in Chhattisgarh. Most of these barrages have been built under guise of irrigation but huge quantity of water has already been allocated to industries. These are in fact major projects as can be visible from the gates, height and catchment area interception of the barrages. Chhattisgarh has been denying these charges and says it has every right to the water of the river. It is now for the tribunal to decide who is right and who is not.

[4] Surprisingly the Odisha government did not quantify the environmental flow during non-monsoon period as can be seen from this data presented during the CM level meeting. And the quantity of environmental flow calculated in the previous table is more than the committed water during non-monsoon period.

[5] This again depicts that there is no water available for maintaining the environmental flow downstream. This creates doubts about Odisha's own plans of utilisation of water during non-monsoon periods.

Tribunals do not solve the real problems

A tribunal, however, does not necessarily solve such conflicts. Tribunals set up under the Inter-State River Water Disputes Act have not been always effective in settling inter-state river water disputes. Researchers believe that they played an effective role initially, however the central government has not been using this mechanism with much confidence (Vaidyanathan and Jairaj 2009). So far nine conflicts, including the Mahanadi dispute, have been dealt by tribunals. A look at the Cauvery dispute would tell us how not much of a hope a tribunal order can offer to Odisha in this case.

The Cauvery[6], called the 'rice bowl of the south', is among the most utilised rivers in the world; barely 5 per cent of its water flows into the Bay of Bengal (Wood 2007). The conflict over the river dates back to more than a century but the tribunal took the matter in 1990. The tribunal[7], which was originally reluctant to give an interim order, then heard petitions and counter petitions on the interim order for almost 16 years and then came out with a final order in 2007 giving away a water sharing formula between the involved states – Karnataka and Tamil Nadu. However, the conflict continued as petitions were filed in the country's apex court. The dispute that has seen several rounds of violent protests remains unresolved.

Actually, many experts believe that large dams cause conflicts as they not only obstruct the river water thereby destroying the flow but also by colonising the water for benefit of a few at the cost of a large population. Large dams become the foci of conflicts essentially because (a) they tend to alter geography and hydrological regimes, sometimes drastically; and (b) they involve issues of control, power and political relations, social justice and equity (Iyer 2007). The Mahanadi conflict that has already seen a lot of political and legal actions but is still at an early stage has to take a cue from all these conflicts and needs to discuss about whole range of issues affecting the basin and its local communities. For the Mahanadi conflict, however, there are many challenges to deal with other than only the construction of dams and barrages upstream.

A research (Panda 2018) done by the author found out that while the inter-state dispute between Odisha and Chhattisgarh centred on reduced flow of water at the Hirakud reservoir because of the dams and barrages constructed upstream, the impact of coal mines and

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6 The Cauvery is one of the major rivers of the peninsular India. It rises at an elevation of 1,341 m at Talakaveri on the Brahmagiri range near Cherangala village of Kodagu district of Karnataka and drains into the Bay of Bengal at Poompuhar in Tamil Nadu.

7 The tribunal had over 440 days of hearing and had to read about 36 volumes of documents that ran to several thousand pages, many technical notes and other submissions. (Main source of information: Wood 2007).

thermal power plants (TPPs), and other industries did not come up for discussion. This is because both the states have committed themselves to mining and industrialisation in the name of 'development' and have been promoting the Mahanadi as a 'water surplus' river for inviting more investment into mining and industrial sector. This research highlighted some such real issues being faced by people affected by mining and thermal power plants.

Coal curse for the Mahanadi and its indigenous communities

The Mahanadi river basin is rich with coal. Chhattisgarh holds the catchment of four rivers including the Mahanadi. Large scale mining in Chhattisgarh is already degrading the Mahanadi's catchment and affecting the quality of the river water. Odisha and Chhattisgarh are two of the richest mineral bearing states of India. Chhattisgarh has 16 per cent of the total coal deposits of India; 44,483 million tonnes coal has been estimated in 12 of the state's coalfields. The state ranks second in the country in coal production and contributes over 18 per cent to the total national production[8]. Chhattisgarh, which is presently one of the few states that have surplus power, has signed MoUs for about 1,40,000 megawatt (MW) of coal fired power plants including the captive power plants (CPPs)[9]. Most of these have come up, or will come up in the Mahanadi basin.

A barrage by Chhattisgarh on Mahanadi. Photo by Ranjan K Panda

8 http://www.chhattisgarhmines.gov.in/Coal.htm

9 http://industries.cg.gov.in/SIPB/pdf/List_of_MoUs.pdf

We took the case of only one coal rich district of Chhattisgarh – Raigarh, a critically polluted area, which too is a destination for many power plants. Raigarh district has a population of about 15 lakh people, 12.5 lakh of who live in rural areas. Most of the people depend on agriculture as their primary livelihood, and mining and industries have been creating lots of troubles for them. Less than 3 per cent of rural households in Raigarh have access to piped water[10].

With 75.799 billion tonnes of coal reserve, Odisha occupies almost 24.72 percent of coal reserves in India. The Ib Valley coalfields covering almost entire Mahanadi catchment, hold 24.830 billion tonnes of coals[11]. Various estimates show that Odisha is planning to generate about 58,000 MW of coal fired power and Jharsuguda district, a sample district that was analysed for a study (Panda 2018), is going to bear a major burden of it. Besides, the Mahanadi is going to bear the maximum brunt of the coal fired power plants producing such huge amount of power. Jharsuguda, another critically polluted district in the basin, has a population of about six lakh people. More than 60 per cent of them live in rural areas and are still dependent on agriculture, forest and other local resources. Only about 4 per cent of the rural households have access to piped water[12].

In both these districts the local people have lost their lands, water and forests for these mining companies and power plants, and have been struggling with pollution as the industries have got richer. The coal mines and TPPs have not only polluted the landscape and water resources, but also have gobbled up several feeder rivers and streams reducing thereby the flow to Mahanadi. These issues do not figure in the political fight between the two states for their due share of water from the river. Another critical aspect, climate change, also does not figure as prominently as it should. Even though Odisha has been talking about climate change impacts on the basin, the need for a comprehensive analysis of the impacts of it on the people and their livelihoods has not come up.

Climate change dries up Mahanadi

Climate change is a major factor for growing distress of the Mahanadi. A study of 2010, done using various scientific models, present a decreasing trend in the monsoon flows of the Mahanadi at the Hirakud Dam (Ghosh et al 2010). An earlier study on the Mahanadi river also observed a decrease in monsoon stream flow for the historic period. One of the possible reasons for such a decreasing trend is the significant increase in temperature due to global

10 Analysis of Census 2011 data.
11 http://www.mcl.gov.in/Others/ecoalfields.php
12 Analysis of Census 2011 data.

warming. Analysis of instrumental climate data has revealed that the mean surface temperature over India has increased at a rate of about 0.4 degree Celsius per century, which is statistically significant (Ghosh et al 2010, and Rao 1995). A latest study finds out that the water yields of major surplus basins, such as the Mahanadi, Godavari and West Flow River–I, have exhibited decreases in recent periods. The water yields show decreases of more than10 per cent for the Mahanadi (Ghosh et al 2016).This is mainly because of significant decreases in rainfall.

Ecological concerns and concerns emerging from climate change were hardly any issue for most of the river conflicts in the country when they started. However, they have to be taken into consideration in the Mahanadi dispute. In fact, environmental concerns, wherever they have been the points of discussion or dispute, have been mostly talked about in terms of reduction of flows. No doubt, the reduction of flows because of upstream dams or barrages or even because of heavy upstream water use (apart from affecting the availability of water) can have serious environmental/ ecological impacts in the downstream areas (Iyer 2007), but climate change and other factors downstream also have serious ecological impacts. In a basin like the Mahanadi and many other basins where there is vast destruction of forests and hence top soil, there are many more ecological concerns like erosion of river banks, reduction in soil fertility and reduced rate of groundwater recharge.

Cooperation, not conflict, is the way

For the Mahanadi, the ambitious and aggressive plan to mine coal and build coal fired power plants by both the governments, is creating a dangerous cocktail of pollution, greenhouse gas emission, loss of local natural resources thereby adversely affecting health, livelihood and dignify of the local and indigenous communities. The Odisha and Chhattisgarh governments should move beyond the conflict and work in a cooperation mode to address all these issues if they really want to solve the Mahanadi dispute and conserve the river basins. Forest conservation, ensuring rights to local indigenous communities over the local natural resource, moving towards a green energy path, revival of water bodies and feeder streams/ tributaries and climate change action plans are some of the key joint actions both the states can take. The current laws of the land have no such mechanisms under which states can work together on a basin. The IRWD Act only comes into picture when a conflict arises. Another law, the River Boards of Act (RBA) of 1956, which was meant to foster joint action by states to develop river basins, has been a dead letter, as termed by the government appointed Sarkaria Commission on centre-state relations. The current central government has in 2018 drafted a bill to replace the RBA of 1956 in order to take control of the

management of interstate river basins, reduce conflicts and foster cooperation for sustainable management of the basins. However, this Act will hardly see the light[13] of the day as it tries to give more control to the centre over the states while, as per the Constitution, water is primarily a state subject.

Under the current situation therefore the states need to be proactive and go for a joint mechanism of cooperation, by moving beyond conventions, and save the dying rivers and its communities. For this to happen, an urgent plan to phase out coal fired power plants is needed. Even as the hearing in tribunal continues, the chief ministers of both the states should open the gates to talks between them to discuss the real challenges such as climate change, drought, crop failure, phasing out coal and paving way for green energy sources so that the way for cooperation can be opened. The Tilia villagers as well as 40 million people and other species dependent on the Mahanadi can then see a hope amid the despair.

Disclaimer: This article was prepared with the support of the Heinrich Böll Stiftung India. The views and analysis contained in the publication are those of the author and do not necessarily represent the views of the Heinrich Böll Stiftung.

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[13] https://www.thethirdpole.net/en/2018/11/12/top-down-mindset-bedevils-draft-river-management-bill/

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