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Management and Impact of Mining Practices on Water Resources Near Haridwar and Adjoining Areas

Dr. Shivani Pattnaik

Assistant Professor, Department of Chemistry, DBS (PG) College, Dehradun, Uttarakhand, India

ABSTRACT: The areas of Haridwar also known as land of rivers has seen increase in riverbed quarrying operations over past decade. With establishment of stone crushers industry, scale and intensity of riverbed minerals (RBM) excavation has further increased in past few years. So has become the impact on villagers and rivers. However, the government lacks monitoring, transparency, accountability in checking the unscientific, unauthorized RBM as is evident from a review of Haridwar Mining and Geology Department (M&G) website and media reports. In fact the state government has neither conducted replenishment study nor formed District Mineral Foundation (DMF), suggesting that it is hand in gloves in organized loot of RBMs. A study on Aquifer Mapping in Haridwar District, Uttarakhand was taken up by Central Ground Water Board, Uttaranchal Region during with an objective to identify and map the aquifers at micro level, quantify the availability of the ground water resource and suggest aquifer management plans compatible with the ground water demand, the aquifer characteristics and the basic issues of the area. The study area consists of 6 Blocks of Haridwar district i.e Roorkee, Bhagwanpur, Laksar, Khanpur, Bahadrabad and Narsan.

During the study period, available data was compiled, data gap analysis was carried out and data generated to fill these gaps. Extensive hydrogeological surveys were carried out including village wise well inventory, water level and water quality monitoring, etc. All the data collected using various techniques was studied and synthesized in the form of Aquifer maps incorporating the various attributes of the aquifer system. Based on these Aquifer maps and analysis of data, Aquifer Management Plans were prepared. The study also identifies the major groundwater issues in the study area that need redressal through appropriate management plans. The support received from different central and state government agencies has helped a lot in completion of this study. The report deals with each aspect of the study carried out in much detail. It is expected that this report will be of immense help and interest to the planners, policymakers, professionals, academicians and researchers dealing with water resources in general and groundwater in particular.

KEYWORDS: Haridwar, mining, water, resources, management, impact, adjoining, areas, surveys

I. INTRODUCTION

With the growing human population and ever increasing demand for water supply for drinking, agricultural and industrial purpose, pressure has been mounted on this renewable but limited resource. Ground Water is an important source of fresh water. For the scientific exploration of this natural resource a judicious development and management is required. Apart from the general hydrogeological condition of the district, efforts have been made to present the information which shall help the local state government and other user agencies in planning various development activities for the welfare of the people. District Haridwar comes under hot sub-humid (dry) eco-region with alluvium-derived soils. The eco-region has hot, sub humid (dry) climate. It covers northern Indo-Gangetic Plain, including Piedmont Plain of the Western Himalayas. Also experiences moderate subtropical to humid climate with three distinct season's viz. summer followed by rainy and winter seasons. The

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temperature begins to rise from March (27.60 C) and reaches to its maximum at during May (37.20 C) with the commencement of monsoon season by the mid of June and the temperature begins to lower by the end of June. During the winter season in the month of December to February the temperature ranges between 24.70 C to 17.70C. The mean monthly wind speed is highest the summer season when it goes up to 2.4 km/hour in the month of May and June and the minimum wind speed is observed during winter when it is 0.5 km/hour in the month of November. The evaporation is maximum in the month of May 156 mm and minimum 24.5 mm in the month of January.[1,2]



Clock Tower, at Har-ki-Pauri, Haridwar.

The statement of the Cabinet minister Dinesh Agarwal on resumption of quarrying in the rivers of Haridwar has elicited a mixed reaction, leading to a wave of cheers among the miners and stone-crushers while some voices are being raised against it as well.

Clarifying the State Government's stance on the quarrying issue, the Forest minister said that the mining activities would soon resume in seven rivers flowing through Haridwar.

On the expected lines, the statement has triggered criticism from those who have been staging movement for a long time to stop mining activities altogether while it has brought cheer to operators of stone crushers.

Condemning the statement, the founder of Matri Sadan Ashram at Jagjeetpur Swami Shivanand said the minister's statement has proved his active association with the mining mafia. "He is actually their patron," he said.

Tearing further into the minister, the seer said he himself had a stone crusher in Shyampur which had come up flouting the forest norms on the banks of Ganga.

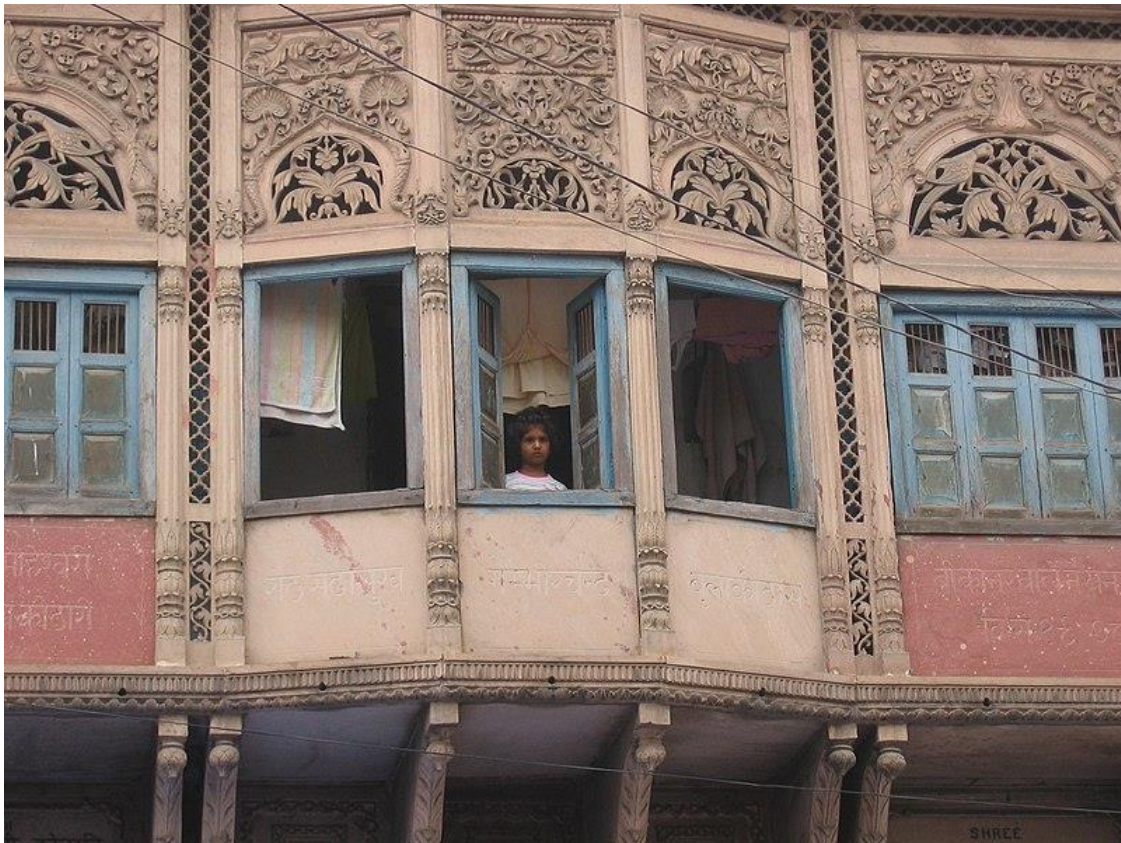
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MIA from laksar, Sanjay Gupta said, "The State would suffer because of this wrong policy of the state government. Only manual picking should be allowed so that the poor residing in slums on the banks of Ganga earn some money through it to support their families. Desecrating Mother Ganga with JCB and other heavy machinery is condemnable." The miners on the other hand, are happy though a little wary. A fear seems lurking in them that the permission for quarrying on riverbeds would be given for the places under the State-run corporations. Notably, Uttarakhand Forest Development Corporation (UFDC) and Garhwal Mandal Vikas Nigam (GMVN) are instrumental in allotting mining lots.



Architectural details of a Dharamshala, established 1822, Haridwar.

Speaking to The Pioneer, a private mining lot owner Manoj Jain said, "We welcome the decisive statement made by the minister, but a doubt persists in our minds whether private owners would be allowed to carry out the mining work. My quarrying lot is totally legal as we complied with all the formalities and pillar posting was done after proper measurement."

Sounding concerned over what is awaiting the trade, he said those who illegally encroach the forest area and dig beyond the permissible limits in the Ganga are never caught by the police. "No action is taken against the miscreants," he said, adding that quarrying must be conducted as per the laid-down regulations so that the government gets its share of the earned revenue.[3,4]

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II. DISCUSSION

Society's plans for a decarbonized world will rely on renewable energy and transport electrification, which is a copper-intensive strategy. Copper mining activities will struggle to meet this growing demand as new copper deposits discovery rates are lagging, and current operating mines are declining. It is estimated that copper mining supply shortfalls could reach ~ 15 million tonnes by 2034¹. Meeting this demand for copper and other clean energy minerals, against a backdrop of growing operational/environmental constraints, calls for innovations and the adoption of clean technologies. The mining community, contributing between 4% to 7% of global emissions, has set year 2050 for Net Zero as its target for decarbonization. Meaning that to achieve the 1.5°C climate-change, the mining industry will need to reduce direct CO₂ emissions to zero.

At Thermo Fisher Scientific, our solutions include high availability samplers, elemental and particle size analyzers, and bulk weighing and monitoring equipment. Shaped by decades of working with the copper mining industry, this technology enables optimization of mine life and plant feed grade, yield, efficiency, and the profitability of copper mines and concentrators. Ultimately, our technology helps to make clean energy greener. Decarbonization is not all. However, pressure from investors is growing and the social license to operate is getting harder to negotiate. Copper mines must reduce their environmental footprints and the intensity of water and/or power consumption. Furthermore, the concentration or grade of copper in economically viable deposits is decreasing. [5,6]



Kedarnath Temple is one of the 12 Jyotirlingas

Haridwar is a holy city located in Uttarakhand. Its name stands for "Hari meaning god" and "dwar meaning door". It is regarded as one of the holiest cities of India. In addition to its religious underpinnings, and the Ganges river flowing through it, it is also host to heavy industry like BHEL and education institutions like the nearby Roorkee IIT.

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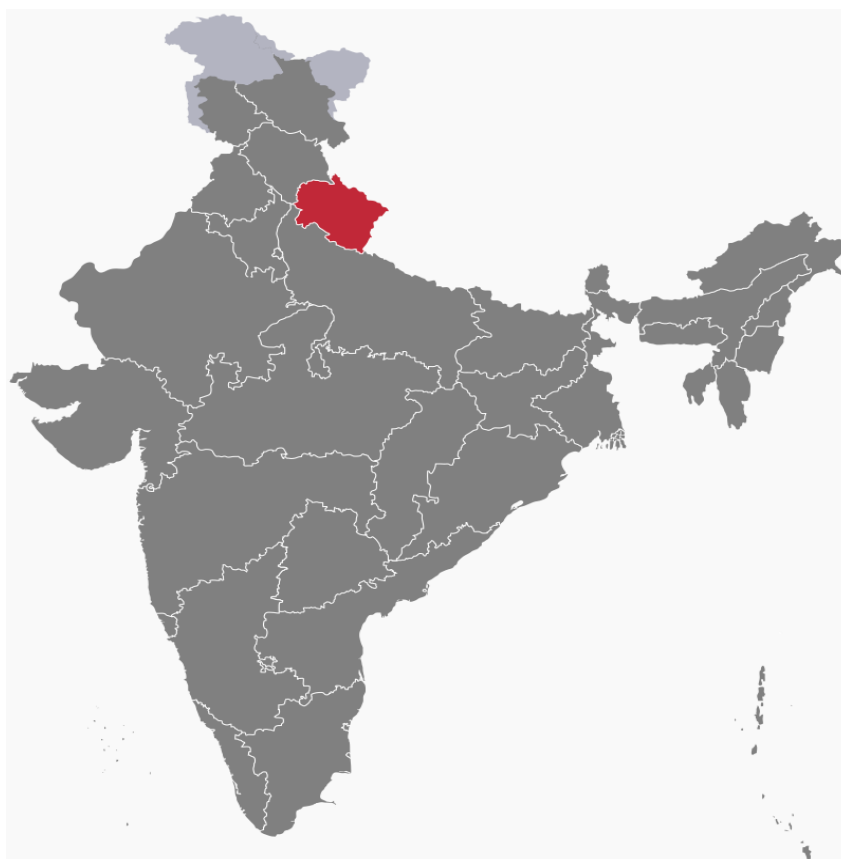
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According to Hindu mythology, Haridwar is one among the four sites where drops of the elixir of immortality, Amrita, accidentally spilled over from the pitcher, in which it was being carried away by the celestial bird Garuda. These four spots -- Ujjain, Haridwar, Nasik, and Allahabad -- have today become places, where the Kumbha Mela is celebrated once every 3 years in any of these 4 places and after a period of 12 years, the Maha Kumbha Mela is celebrated on the 12th year at Prayag in Allahabad. Millions of pilgrims, devotees, and tourists congregate here from all over the world to celebrate the event. They perform ritualistic bathing on the banks of the river Ganga. The spot where the nectar fell is considered to be the Brahma Kund at Har-ki-Pauri (literally, "footsteps of the Lord," and symbolically the footprints of the Amrita), the most sacred ghat of Haridwar; thousands of devotees and pilgrims flock here during festivals or snan from all over India to take a holy dip. This act is considered to be the equivalent of washing away one's sins to attain Moksha.

Sand mining in riverbeds is a practice that is used to extract sand through mining from riverbeds. Sand mining is a direct cause of erosion and also impacts the local wildlife. Here, adverse impacts of sand mining in the River Ganga on the ecology and environment of Uttarakhand and particularly low-lying regions such as Haridwar. Excessive instream sand and gravel mining causes the degradation of rivers. He also highlights the struggle undertaken by the religious leaders of a Haridwar-based Ashram, Matri Sadan, to protest against the sand mining activities imposed by the State Government.

When a separate hill state of Uttarakhand was carved out of Uttar Pradesh in November 2000, largely because of the struggle for it by the people, especially hill women, people hoped that it would be their dream state, where pro-people developmental policies would take shape; they also hoped that mindless exploitation of natural resources would be halted. However, these hopes have been belied each time by the governments of the new state, irrespective of the ruling political party.[7,8]



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Location of Uttarakhand

The pursuit of development rests on the old paradigm: development at all cost, results into a plethora of dams and hydro-electricity projects. Unapologetically, they displace people and devastate lives at large in the upper hilly region and unhindered river mining in the plain, low-lying regions, such as Haridwar, Nainital, and Udham Singh Nagar districts.

III. RESULTS

The National Green Tribunal (NGT) has pulled up the Uttarakhand government for non-implementation of its order on pollution in the Kosi river in Nainital. The green panel had directed that an action plan for the collection and disposal of sewage in the area along the river be submitted within three months. Slamming the state government for its inaction in the matter, the NGT during a hearing stated the government needs to show greater “seriousness”. The tribunal had also issued notices to Uttarakhand environment secretary, heads of Pay Jal Nigam and Pay Jal Sansthan, district magistrate and member secretary of State Pollution Control Board to show cause why costs for adjournments should not be imposed personally on these officers and recovered from their salaries.[9]



Hinduism, art, culture Uttarakhand

The NGT also expressed concern over the fact that two months have passed since the expiry of its order and neither has an application been filed to seek extension nor any steps taken to enforce the order.

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Vinod Singhal, member secretary of the State Pollution Control Board, however, claimed that the board had sought a four-week extension from NGT around 10 days ago.

Kosi originates from the middle Himalayas from Kumaon in Uttarakhand and is a perennial river like Ramganga. The river is being polluted by resorts, hotels and clubs situated in Ramnagar close to the Corbett Tiger Reserve which are flushing their waste into the river, and thus putting the lives of the animals at risk. "There are no industries in Ramnagar, however there are hotels and ashrams that are polluting the river. There is no sewage treatment plant (STP) in Ramnagar. There are some houses which are connected to septic tanks for sewage disposal and solid waste while other houses take recourse to drains which open into the river. Jal Nigam has prepared its action report on Kosi and submitted it to the State Project Management Group, which is headed by forest secretary and additional chief secretary S Ramaswamy, as well as National Mission for Clean Ganga (NMCG) well in time. We brought this fact before NGT, which has now exempted us from punitive action. Meanwhile, Prabhat Raj, chief engineer, Jal Nigam, said that 21 drains in Ramnagar have been identified in its action report. The report suggests building of two STPs and has estimated an expenditure of Rs 1.5 crore on the project.[8,9]

IV. CONCLUSIONS

Ironically, in a closed loop of destruction, sand mining threatens the very infrastructure it is mined to build. In Mahad, sand dredgers were found under a bridge that collapsed. In Uttarakhand, several important bridges collapsed when sand was mined excessively nearby in 2011. Sand mining contributes to, and worsens, the effects of climate catastrophes too. Sand is required for building. After every climate disaster, it is also required for re-building, further increasing environmental and human costs. Women of coastal communities are disproportionately affected, according to multiple reports of the United Nations, because women face an increased burden of household responsibilities.

In Uttarakhand, where sand mining was directly responsible for the flooding of the Ganga and huge loss of property and lives, an investigative report for The Third Pole by Monika Mondal says, "The Centre's sand mining framework reports that revenue from the sale of sand in Uttarakhand was Rs 1.735 billion (about \$23 million) in the financial year 2014, and nearly doubled to Rs 3.353 billion, the latest year for which figures are available."

"Sand is free, it's lying around, and anyone can plunder it. This makes sand mining a difficult issue to control," says senior counsel Chander Uday Singh, who appeared pro bono with Ishwar Nankani in the first PIL against sand mining in 2006 in the Bombay High Court. He goes on to say, "Major rivers, including the Ganga, Yamuna, Godavari and Kaveri are being plundered unchecked already. High demand and easy availability of sand for construction is a cause of massive environmental degradation and human rights violations, more known now than they were when Sumaira was first attacked by the sand mafia on Kihim Beach in 2004 and 2010."

Natural disasters like floods and landslides are "putting a strain on the state's economy," ironic that sand, extracted recklessly to build the infrastructure for economic growth, is itself placing the economy at risk.

In the absence of official figures, the real value of sand extracted for construction can only be estimated as a percentage of India's building plans. A cement-concrete infrastructure cannot be built without sand or a sand-substitute. The corresponding cost of sand makes it our single largest commodity.

The government is our largest builder of infrastructure. Nevertheless, it has never conducted a full audit of sand availability or matched it with the requirements for our ambitious development plans. There have been no studies on the monetary value of the sand that will be needed for construction and otherwise. While sand continues to be stolen from our rivers and beaches, sand mining has been legalised to meet increased demand.

CoP26, the crucial climate change conference at Glasgow, concentrated on phasing out coal and curtailing deforestation to cut emissions and prevent the most devastating impacts of climate change later. However, CoP26 did not consider

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sand mining or emissions from cement-concrete construction.

India is hastening to catch up with the failed development models of ‘developed countries.’ These models are highly polluting and have led to the Earth’s climate crisis, the most serious existential threat facing humans today. Today, we better understand the very real costs of such polluting models of development. Yet, we choose further disaster when we do not factor environmental, financial or human costs of climate change adequately into our growth models.

The sand mafia has murdered, accidentally killed or attacked hundreds of people including activists, journalists, government officials, police, even members of the elected Assembly.

Late Shabnam Siddiqui, executive director, UN Global Compact Network India, concurred: “Only the complete participation of women, who literally hold half the sky, will ensure... SDGs and their targets have a real chance of achievement.”[9]

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