India Rivers Week 2020 Is Sand Mining Killing our Rivers?

India Rivers Forum is organising India Rivers Week (IRW) 2020, a series of dialogues (online webinars) with a focus on the theme: "Is Sand mining killing our Rivers?" This will include four regional dialogues focusing on East (including North East), West, North and South India and the final one focusing on sand mining as a national issue. While sand is procured from sources other than river beds too, like from coasts and desert sand dunes, the focus of IRW 2020 is sand sourced directly or indirectly from the rivers.

India Rivers Week was started in 2014 to celebrate rivers and to focus on river conservation efforts. The Organizing Committee¹ has organized India Rivers Week and India Rivers Day meetings in alternate years. Themes of past IRW/IRD have been Rivers in Crisis, Yamuna River, Urban Rivers, River Health, Ganga River and Institutional Framework for River Governance.

Some obvious Impacts of riverbed Sand mining: Sand mining in rivers or mining of River Bed Material (RBM) (including sand, gravel, boulders etc) has huge impact on Rivers in multiple ways: physical, ecological and dependent livelihoods among others. Sand is by definition, a key ingredient of the Rivers. It provides habitat for wide range of biodiversity in the river. It provides both sub surface storage space and a mechanism to recharge the groundwater. The sand, along with silt, clay, pebbles and boulders are an integral part of a river system and act as key existential medium in floodplains and deltas. To ensure that sustaining river connectivities is very important. There are structural issues involved with sand in the river, including river bed & river banks stability and even the safety of manmade structures like bridges, flyovers, aqueducts and river bank constructions.



Sand in River Ecosystem: A 2018 WWF paper on "Impacts of Sand Mining on Ecosystem Structure, Process and Biodiversity in Rivers"² says: "Sand which is part of the overall sediment load that rivers carry from the head-waters in the mountains to the estuaries, deltas and near coastal marine ecosystems plays an important role in providing habitat for many aquatic organisms in the river ecosystem and in the flood-plain. These include mid-river islands and sand-bars. The reduction in sediment load especially sand due to upstream trapping in reservoirs increases the vulnerability of downstream regulated rivers and their channels to erosion and it also reduces the ability of the river to maintain braided channels that are so important for many organisms at different stages of their life-history. Sand mining on already sediment depleted rivers further degrades the river ecosystem.

"Many studies have highlighted ecological impacts of sand mining which includes the direct disturbance and removal of habitats in rivers, deltas and coastal areas, loss or changes to the vegetation structure of riparian zones, and increased or decreased downstream sedimentation affecting habitat quality. Sand mining interferes with a number of ecological processes, such as macro-invertebrate drift, fish movements, abundance and community structures, and food web dynamics. A Quick Scoping Review quoted in a 2018 WWF report often inferred impacts on populations, such as loss of native species and increases in invasive alien species, but few had long-term data sets to confirm this. The lack of scientific and systematic studies of sand mining in rapidly developing countries prevents accurate quantification of the volumes of material being mined, or the type, extent and magnitude of impacts."

1988 Campaign against sand mining in Maharashtra To illustrate how sand in river helps improve water security, read what K J Joy and Nagmani Rao³ wrote in their 1988 EPW article about Yerala River in Sangli-Satara districts of Maharashtra: "The sand deposits are considered to be a special feature of Yerala. People make a comparison between the Yerala river and its tributary, the Nandani. The difference between the two is that unlike Yerala, river Nandani has no sand deposits—only exposed impermeable rocks. Even with one flood in the Yerala the sand holds water for at least four months; but in the case of Nandani river one does not get water to even wet one's toes! This is the difference the presence of sand makes."

Does Sand Mining Governance appreciate that it is killing rivers: However, there is not sufficient appreciation, locally, at state level, nationally and internationally of the role of sand as key ingredient of the rivers in law, governance, institutions, economy, judicial system, media, decision making processes or for that matter even in the society. Scientific work on how important sand is for the rivers is far from adequate.

Sand miners have been found to be constructing additional roads and bridges in the river bed, for access to the river bed and transportation of the mined material. These are major interventions, completely illegal, that cannot be just over night operations or can be hidden. And yet, in most cases, the enforcement and governance agencies claim ignorance when questioned about their inaction even for such illegal major river bed interventions.

Sand is the second biggest extracted natural resource after water. There is possibly a case for limited extraction of sand from the rivers. But to ensure that such extraction remains within sustainable limits, and does not impact the key services and existence of the river, this has to be done only manually. There is clearly no case for use of heavy machinery for extraction of sand from rivers. This will be an important question to debate in the proposed dialogues.

How much sand does India consume? So how much sand does India use? According to WWF report (see figure above), India may be using about 1.5 tonnes sand per capita per annum in 2010, up from about 0.8 tonnes per capita per annum ten years earlier. By that growth rate, we would be using around 2.5 tonnes per capita per annum in 2020.



Emergence of Sand Mafia: Several people including journalists, police personnel, administrators, labourers, local residents, activists etc have been killed by sand mafia in recent years when former tried to stop illegal and unsustainable sand mining or died in accidents and disasters related to illegal sand mining. Judiciary has been trying to curb the menace of illegal sand mining, and have on occasions used bitter pills like imposing total prohibition on sand removals. Government has been coming out with guidelines⁴, mostly on push from judiciary⁵, but has clearly lacked sincerity in achieving credible governance. The Governments have shown great faith in technology to curb the menace of illegal sand mining, but seems to have conveniently forgotten that without transparent, participatory and accountable governance, no amount of technology, guidelines or institutions would help.

Who uses Sand: Sand is a key ingredient in all kinds of building constructions, glass and electronic industry, among others. These constitute a huge part of national economy. Urban areas are clearly the biggest demand centers. Sand is also a trans-boundary issue. There is also significant international trade in sand. For example, Dubai imports sand from Australia for many of its famous constructions. In India there have been attempts to import sand to bridge the demand supply gap at times. However, large part of the international sand trade is undocumented. A paper referred below by US scientists published in Nature in July 2019 noted: "...... between 2006 and 2016, less than 4% of the 80 million tonnes of sediment that Singapore reported having imported (Singapore is the World's largest importer, mainly for land reclamation) from Cambodia was confirmed as exported by the latter". The report also mentioned that Illegal sand mining is rife in around 70 countries. The report says:

"International sand-trade databases are too crude to track sustainability. The global UN Comtrade database, for example, collates the export and import values of sand and gravel in one or two categories, based around the quality and composition of material. It does not distinguish between sand taken from rivers and deltas that are being replenished (active sources) and sand removed from passive sources that are not, such as geological deposits... in the Mekong delta, the Vietnamese government estimates that nearly 500,000 people will need to be moved away from river banks that are collapsing as a result of sand mining in the channel. In the Ganges River in northern India, eroded river banks have destroyed the nesting and breeding habitats of fish-eating gharial crocodiles (Gavialis gangeticus), a critically endangered species with only around 200 adults left in the wild in northern India and Nepal."

Alternatives to River Sand Mining: Some alternatives to use of river sand have been suggested. These include M-Sand: Manufactured sand and also recycling construction waste, in addition to sustainable use of river sand. Use of sand from sediment accumulated in reservoirs behind dams has also been suggested, though there are not many success stories in this regard so far. A significant part of the brick making happens at river beds or using riverbed material like clay. To the extent that such bricks can get replaced by fly ash bricks, fly ash can help substitute river bed material.

According to the Nature paper mentioned above, the alternatives include "industrial slag and waste (including copper, fly ash and foundry sand) and recycled plastic. For example, roads, car parks and driveways made from plastic waste embedded in asphalt can lessen demand for bitumen and aggregate."

Is Sand a minor mineral? Sand is technically considered a "Minor" mineral, but this has possibly led to its importance getting under estimated. In terms of volumes extracted, sand extraction is at much bigger scale than any other mineral. So is there a case for reconsidering this nomenclature? One option is to classify it as non metallic mineral as the WWF report does.

A number of departments of the government are involved in governance of river sand mining, including environment department, geology & mines department, revenue department and of course law enforcement department. There has been demand for special police force by some⁶ to stop illegal sand mining. But who suffers the most when and immediately where there is unsustainable sand mining? It's the local communities. But the Gram sabhas & Panchayats have no role in monitoring or governance of sand mining. Is there a case to have key role for them in sand mining monitoring and governance?

Regional Reports: For each region, we are hoping to put together a report, through a regional lead (embedded in a local organization) that gives status of sand mining in that region including governance, institutions, economy, riverine conditions and impacts, best practices, success stories, lessons for future among others.

Some key aspects that the regional report may include are:

- Revenues generated by each state in different regions from river sand mining
- The primary focus in governance (only revenue/ revenue + conservation/ others) in each state in the concerned region
- Rivers most threatened in order of priority in the region (many rivers could be interstate) from sand mining
- Is it necessary to remove some sand from rivers? If yes, how is this to be decided? What will constitute a scientific replenishment study? Is there any such sand available in peninsular India's rivers?
- Major consumer centres of sand mining in different states in the region
- FIR (First Information Reports) on cases of illegal sand mining, violence related with it, as

reported by media (Print, TV, Social Etc)/ documented by civil society groups

- · Is some river sand preferred over the other river sand?
- River sand alternatives if any that have been tried?
- Issue of alternative construction designs and methods that will reduce use of riverbed material.
- · River sand extraction guidelines that different states in the region have
- · Local people's views on past sand removal practices and what is happening now
- Efforts to push river dredging/ desilting in the name of river rejuvenation and use of NREGS money being used for that. One such example was the Jal Yukta Shivar program in Maharashtra.
- User (Real estate, other users) views in use of river sand and possible alternatives
- Notable Court cases (High Court, NGT, Supreme Court etc) relating to sand mining in the region
- Does Panchayats/ Gram Sabhas have any role in sand mining governance in any of the states?
- · What changes would help in making the sand mining governance more effective?
- Notable activists/ journalists/ administrators/ scientists/ lawyers etc who have taken action
- · What constitutes a Scientific Understanding of Sand mining;
- A sustainable way forward.

Each such report is to be prepared and presented by a representative of the local organization at the regional dialogue. A panel discussion would follow the presentation. Panelists may include representative from government, judiciary, civil society, media, academics and user group. It would be helpful if at least one affected person could also speak at each dialogue.

It is hoped that at the end of this exercise, a report on the State of river sand mining in India, along with recommendations for the future would be produced.

To join our online dialogues, please register at the following link: www.indiariversforum.org/IRW2020registration

Endnotes:

¹ It currently comprises of INTACH, WWF-India, Toxics Link, Yamuna Jiye Abhiyaan/ Peace Charitable Trust, People's Science Institute and SANDRP (a YUVA Project).

²Koehnken, L., and Rintoul, M. (2018) Impacts of Sand Mining on Ecosystem Structure, Process and Biodiversity in Rivers. WWF

³ "The Great Sand Robbery and impending Ecological Disaster", Economic and Political Weekly, Aug 13, 1988, pp 1669-1673

⁴ Some of the recent documents: From MoEF in Jan 2020: <u>http://environmentclearance.nic.in/</u> <u>writereaddata/SandMiningManagementGuidelines2020.pdf;</u> From Dept of Mines in March 2018: <u>https://mines.gov.in/writereaddata/Content/sandminingframework260318.pdf</u>. Sustainable Sand Mining Guidelines of MoEF in 2016: <u>http://environmentclearance.nic.in/writereaddata/</u> <u>SandMiningManagementGuidelines2016.pdf</u>

⁵ e.g. The Supreme Court in its order on Feb 27, 2015 noted: "it (sand mining) may have an adverse effect on biodiversity as loss of habitat caused by sand mining will effect various species, flora and fauna, and it may also destabilise the soil structure of river banks and leave isolated islands."

⁶ e.g. Ms Sumaira Abdulali of Avaaz Foundation, Maharashtra, a prominent voice on the issue of sand mining, see: <u>https://www.youtube.com/watch?v=x2RBuWS28Sc</u>