

## BUILT ON SAND

### An Examination of the Practice of Sand Mining in South Asia with Observations from the Mahakali and the Teesta Rivers

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Sand is a limited resource and the most mined mineral in the world in terms of volume. Yet its presence is taken for granted. Demand for sand has increased significantly as a result of modernization and growing urbanization across South Asia. The demand is likely to increase further as each country in the region tries to forge its own path to economic prosperity. Amidst optimism about growth, there are growing concerns about the sustainability and ecological viability of existing supply systems. Failure to adequately regulate sand mining can have irreparable consequences for the environment and the society. Based on empirical insights from the Mahakali and Teesta Rivers, this brief summarizes key issues and observations regarding sand mining in Nepal and India and provides recommendations to promote more responsible and sustainable sand mining practices.



### GOVERNING SAND MINING

A key challenge in sand mining involves the need to strike a balance between two key issues: ensuring that the demand for sand is met at an affordable price and ensuring sustainable extraction of sand with minimal impact on the river ecosystem and long-term benefit to the society. However, the interests and incentives around these two issues may not always be aligned; on the contrary, they may even be in direct conflict with each other. Policymakers have attempted to respond to this challenge by formulating stringent regulations. But given the market forces of a growing demand and limited supply of sand, illegal sand mining continues to flourish. This situation is even more pronounced in developing countries in South Asia where weak governance impede regulatory oversight and enforcement.

### IMPACTS OF SAND MINING

Before sand became such a fundamental element of modern society, it had always been a core part of the natural riverine ecosystem. With a widespread extraction of sand, a number of studies are pointing to the negative impacts and the unsustainability of the current practice. A major impact highlighted in these studies is channel incision, where the removal of sediment has been noted to disrupt existing balance between sediment supply and transporting capacity of the river<sup>1</sup> leading to the erosion of river banks, lowering of ground water table in the alluvial plains, loss of wetland areas, and threats to the structural integrity infrastructure such as bridges and dams.<sup>2</sup> Another impact is related to the decrease in downstream sediment flux, which over time holds potential to exacerbate the effects of sinking in river deltas.<sup>3</sup> Other studies also point to the decline of

floral and faunal diversity within the river basin, decline of terrestrial insects whose larval stages are in the shallow water, loss of habitat and or changes in breeding and spawning grounds of certain fish species, and reduction in inland fishery resources.<sup>4</sup>

**SAND MINING IN NEPAL: KEY INSIGHTS**

The responsibility of overseeing sand mining in Nepal is spread across the three levels of government in the following manner:

Government	Responsibility
Central	<ul style="list-style-type: none"> <li>◆ National mining policy and standards</li> <li>◆ Environmental clearance – EIA (if extraction is above 300 cubic meters from a single site)</li> </ul>
Provincial	<ul style="list-style-type: none"> <li>◆ Provincial mining policy and standards</li> <li>◆ Environmental clearance – IEE (if extraction is below 300 cubic meters from a single site)</li> <li>◆ Establish rate of royalty</li> </ul>
Municipal	<ul style="list-style-type: none"> <li>◆ Municipal mining policy and standards</li> <li>◆ Lease award and administration</li> <li>◆ Royalty collection</li> <li>◆ Monitoring and oversight</li> </ul>

**Federalism and jurisdictional overlap:** The major challenge in Nepal, at this point of time, is related to the implementation of federalism. Almost all sectors, including sand mining, is currently characterized by overlapping responsibilities between the three levels of government. The lack of homework to ensure a smooth transition from a unitary to federal governing system is gradually becoming clear. With regard to sand mining, this is evident in the royalty-sharing dispute between the two municipalities—namely Mahakali and Bhimdutta, that share the Mahakali River. In the absence of a clear framework for royalty sharing, both municipalities are claiming for a larger share of the royalty. Additionally, institutions responsible for field monitoring and oversight lack the resources to fulfill their mandate.

**Incentives of local government:** Because royalty from sand mining lease brings in a sizeable amount of revenue, local governments have an incentive to oversee this activity. But the volume of extraction, currently established by Bhimdutta municipality at 250 cubic meter per day, is undoubtedly based not for the regard of sustainable extraction, but for the preference of municipality to undertake the Initial Environmental Examination (IEE) over the Environmental Impact Assessment (EIA), which is

less resource intensive and does not require a clearance from the federal government.

**Private sector and extraction:** The law imagines that sand mining awarded by local governments is done by single lessee with the necessary capacity; in reality, however, the contractors are more interested to serve as intermediaries, selling off the entire contract to other contractors at marked-up prices or sub-contracting and collecting rent from other small sand miners.<sup>5</sup> This increases the possibility of exceeding the legal limit for extraction as there is a perverse incentive for the contractor that is based on the volume of sand extracted. Similarly, the current policy framework allows contractors of government and *national pride projects* to directly extract the required volume of sand from the river. However, over-extraction and siphoning off of resources to local markets is a common phenomenon in such projects.

**Sand mining and communities:** People living near to the extraction sites point to the increased dust pollution and the damage to local infrastructure as some of the major negative impacts of sand mining. However, sand mining is a key source of livelihood for many riverine communities in the Mahakali River. As a border river, it also attracts seasonal migrant workers from both Nepal and India.

**SAND MINING IN INDIA: KEY INSIGHTS**

The responsibility of overseeing sand mining in India is spread across its three tiers of government in the following manner:

Government	Responsibility
Central	<ul style="list-style-type: none"> <li>◆ Sustainable Sand Mining Management Guidelines</li> <li>◆ Environmental clearance – EIA (if mining lease area is over 50 hectares)</li> </ul>
State	<ul style="list-style-type: none"> <li>◆ Minor mineral rules and regulations;</li> <li>◆ Rate of royalty and fees</li> <li>◆ Environmental Clearance (if mining lease area is between 5 and 50 hectares)</li> </ul>
District	<ul style="list-style-type: none"> <li>◆ Prepare District Survey Report</li> <li>◆ Lease award and administration</li> <li>◆ Environmental Clearance (if mining lease under 5 hectares)</li> <li>◆ Royalty collection</li> </ul>

**Activism and judiciary-led reforms in India:** The Indian judiciary and environmental activists have played an instrumental role in bringing about a policy regime geared towards protecting the riverine environment from indiscriminate sand mining. They

pressured the Ministry of Environment, Forest, and Climate Change to amend the EIA Notification, making environmental clearance mandatory for mining operation of all sizes, and to roll out the Sustainable Sand Mining Management Guidelines. These changes have now been adopted by the states, who hold the jurisdiction over mining of minor minerals such as sand. However, despite the new regulatory measures, the government has not been able adequately control illegal sand mining; 45,242 court cases related to illegal sand mining were filed across India between 2016 and 2019.<sup>6</sup>

**Nexus narrative of India's sand mining industry:** Terms such as *sand mafia* and *the nexus* have become buzzwords in the sand mining debate in India. Like organized criminal networks elsewhere, these sand mafias are known to receive political protection.<sup>7</sup> In India's federal system, because states have the authority to make policies on natural resources and law and order, state-level politicians and authorities are said to be using discretionary power to extend patronage to sand mafias in return for financial kickbacks.<sup>8</sup> Besides money, sand mafias also resort to violence when required; as a result, local authorities exercise extreme caution and/or avoid monitoring their activity. The nexus between *mafias*, politicians and authorities was identified by many stakeholders in the Sikkim and West Bengal region as a major hindrance to effective monitoring and regulatory enforcement.

**Sand mining, communities, and their livelihood:** Sand mining is widespread not only because it benefits those involved in illegal schemes, but also because it provides employment to many community members along the river, especially the poor who lack a stable source of income. Many communities living along the Teesta voiced strong support for undisrupted mining operations.

## GENERAL OBSERVATIONS

**Differences in scale and complexity of mining operations:** In Nepal, the scale of sand mining and the corresponding supply of sand from the Mahakali River is relatively small. The institutions that have been established to manage the industry are fairly straightforward mechanisms for managing and regulating the industry. As the state restructuring process is still underway, the primary issue in the Mahakali region is not illegal sand mining as such, but rather jurisdictional overlaps and mechanisms for distributing royalty among the administrative units. In India, however, policies and institutions for

overseeing sand mining are more complex due to a number of factors – huge market demand, a willing supply chain, mature and vocal activism, an active judiciary, and regulatory norms of both the central and state governments.

**Policies, underlying incentives, and the impact on sand mining:** Nepal and India have established, at least on paper, regulatory regimes intended to promote sustainable sand mining. However, sand mining operations in the Mahakali and Teesta Rivers reveal a huge gap between policy and practice. This demonstrates that the dearth of sustainable sand mining practices has less to do with the absence of policies and more with the failure to adequately implement existing ones. This is due to the following reasons:

- *Capacity and resource constraints*
  - ◆ Institutions, especially those at the local level, responsible for managing and monitoring the practice of sustainable sand mining are constrained by the lack of adequate human resource and technical expertise.
- *Incentives and institutional response*
  - ◆ Sand mining in Nepal and India is fraught with influences of cartels and kickbacks. Cartels ensure collusion among the private sector to secure the cheapest contract; kickbacks ensure commissions for the willing officials to be coopted into the illegal mining schemes.
  - ◆ The incentive to over-extract is deeply engrained in the system. With the increasing demand for sand and the limited supply in response, the result is a market shortage that is reflected by a higher market price. The resulting profit incentivizes private extractors to extract more than what they are allowed.
- *Implication of bans*
  - ◆ Given the large demand for sand, a ban on a single river only shifts the problem to other rivers nearby. As policy makers and activists have mostly focused on sand mining in major rivers, the intensity of mining, both legal and illegal, has increased across minor rivers and other smaller tributaries.
- *Limited adoption of manufactured sand*
  - ◆ Despite the Government of India's efforts to promote the substitution of river sand with manufactured sand, lack of awareness and presumptive preference of consumers has limited its widespread use and adoption.

## RECOMMENDATIONS

The underlying drivers that promote sand mining and the impact it can have on the ecosystem around it is a complex issue. Complexities arise because the issues around sand mining are technical in nature, both in terms of the technicalities of modern infrastructure development and of water and riverine ecosystems where sand is an instrumental element to both. Based on our analysis of the subject matter, below we make a few recommendations divided into two categories: low hanging fruits and long(er) term engagements.

### Low hanging fruits

- ◆ **Collaborate with local institutions**, both governmental and non-governmental, to develop and align policies; in getting better estimates of demand and supply of sand; and in increasing the capacity of relevant institutions.
- ◆ **Contribute towards a more effective benefit sharing mechanism** by conducting research on the effectiveness of current benefit sharing mechanisms; organizing advocacy forums and public hearings to promote transparency and accountability; and supporting relevant government bodies to prepare a benefit sharing plan.
- ◆ **Provide local, regional, and national-level policy platforms** that offer space for constructive criticisms and solutions-oriented dialogues on areas such as promoting alternatives to river sand; overcoming challenges in governance.

### Long(er) term engagements

- ◆ **Invest in building knowledge** to help better understand and estimate the nature and level of impact of sand mining and generate knowledge about the immediate basin as well as areas much further downstream. The knowledge generated from this initiative should be the basis for reform activism and evidence-based policy action.
- ◆ **Connect global networks** of non-governmental institutions around the world that are highlighting the issue of sand mining. Also promote the sand mining agenda in forums with major global players of the construction sector, especially multilateral banks and national governments.

## ENDNOTES

<sup>1</sup> Wiejaczka, Ł., Tamang, L., Piróg, D., & Prokop, P. (2018). Socio-environmental issues of river bed material extraction in the Himalayan piedmont (India). *Environmental Earth Sciences*, 77(20), 718.

<sup>2</sup> Bravard, J. P., Amoros, C., Pautou, G., Bornette, G., Bournaud, M., Creuzé des Châtelliers, M., Gibert, J., Peiry, J., Perrin, H., and Tachet, H. (1997). River incision in south-east France: Morphological phenomena and ecological effects in Regulated Rivers: Research & Management: An International Journal Devoted to River Research and Management, 13(1), 75-90.

<sup>3</sup> Anthony, E. J., Brunier, G., Besset, M., Goichot, M., Dussouillez, P., & Nguyen, V. L. (2015). Linking rapid erosion of the Mekong River delta to human activities. *Scientific reports*, 5, 14745.

<sup>4</sup> Padmalal, D., Maya, K., Sreebha, S., & Sreeja, R. (2008). Environmental effects of river sand mining: a case from the river catchments of Vembanad Lake, Southwest coast of India. *Environmental geology*, 54(4), 879-889.

<sup>5</sup> Field interview with engineer Himalaya Singh Ayer of Bhimdutta Municipality.

<sup>6</sup> Hon'ble Minister of Mines Shri Pralhad Joshi in his reply to un-starred question no. 2742 in the Lok Sabha on 10th July, 2019

<sup>7</sup> Madhavan, P. (2019). *Sand mafias in India: Disorganized crime in a growing economy*. The Global Initiative against Transnational Organized Crime.

<sup>8</sup> Ibid

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