

Overrated Credence to the Outdated Sand Mining Legislations: A Hydrologically Challenged Measure

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Abstract

The recent floods in the 'God's own Paradise'(Kerala) reminds the Indian Sub-Continent as well as the Global spectators of not just heavy rainfall but also the 'hungry water effect' from deranged desiltation. Laws from the first decade of independence decide the commercial desiltation permits and procedures in most parts of the country with renewed guidelines. The presentation attempts to map the in-river sand mining in all the Indian States, analyze the spatial extent and technology used, resulting degradation of the completely dug-out rivers, alterations in the geomorphology, base flow and river course, conditional water flow into the distributing channels which tend to stand at a higher surface than the further lowered river bed, impact on the continued cultivation in delta regions triggering the contingencies of extreme drought and flood. Poor and delayed adherence to the ecological economic estimates of this evolving nation and the enviro-legal regime can be traced as barriers of environmental restoration. Rampant dredging often with the under and over utilization of mining techniques, reluctant attitude to alternative construction materials raise serious economic & environmental concerns questioning the future livability of the Sub-continent.

Keywords: River, Sand mining, Water flow, Silt, Environment.

1. Introduction

Needless to say, the effects of in-river sand and gravel mining will lead to and have already led to changes in the morphology of rivers, their basins and banks. The head cuts with its knick points are not necessarily of erosion in streams as suggested by proponents of hungry water effect; the unchecked mining for desirable alluvial soils lead to certain portions of the rivers dug out completely and transported to load points for sale; say 15 hectare is the spatial limit imposed, the same area is utilized well beyond its providing capacity, the volume of excavated sand in that particular spatial limit is almost five times of what is proposed, leaving traces of this savagery in the form of deep well-type excavation pits that stagnate pool of water; these pits might be scattered with zero uniformity thereby delaying the flow of water to the far stretched distributaries and sluice canals; not just delaying but also hampering the very possibility of irrigation in the bank side farms because the water first fills these deep unevenly spread out pits before resuming its flow; it is worsened if the released qty from the reservoir is only to ensure a minimum flow.

2. Spatial Extent Allotted and Exploited

During summer seasons, river bed's height will be uneven due to deep desiltation pits leaving thicker sand carpets along with low lying deeply cut narrow channels; the water automatically flows through these channels thereby leaving 1/2 to 3/4th of the river's width untouched; if the mining is only on one bank then automatically other side of river bed is higher than this mined area, thereby, water flowing only in this dug out area; a river with low flow will not have enough momentum to force its way through the high sediment areas, leaving the villages and districts in that bank to be water-scarce or deprived. Alternatively, instead of pits, if the mining is uniform, say the entire 10 hectares is mined out for a depth of 10 metres or 10 metres over 35 hectares on either side of the allotted area (as usually revealed by the Impact Assessment Authority Inspections ordered by Judicial bodies), then coupled with the hungry water effect effectuated by this artificially down-streamed stretch of the river, the river gains momentum, flows free and fast further eroding and lowering the surface height in the mined stretch. Not just that stretch, due to the addition in momentum, the erosion will be greater in the next to be irrigated areas also, jeopardizing the standing infrastructures like water tanks, bridges, railway pillars and also lowering the level of pumping motors fixed on bank sides for channeling the river water for specific local irrigation; the river reaches its drainage area faster giving little time & cost efficient efforts for conserving or channeling the freshwater for agro-uses.

3. Rampant Mining and Rampaging Effects

In India, especially, in the southern fertile states blessed with monsoons, there is always a squabble over water sharing; but when shared, stored and released for irrigation and consumption from the dams, it is left to run off before being captured and utilized due to the geo-morphological changes consequential to rampant sand mining. In certain areas, the in-depth mining has reduced the width of rivers, whereas scattered mining has led to width increase but as a shallow river with small banks, making such areas more prone to floods. In Kerala, the coastal state that is hit by various zoonotic diseases every year and recently succumbed to historic floods, 6 rivers have been banned from being mined. This is due to the very late wake-up call that extensive mining has led to loss of forest cover, forcing several wildlife species to migrate in thousands to nearby villages, bringing the biological carriers of the most dangerous of diseases closer to us inside the biosphere.

Example: Nipah virus outbreak and spreading, that can be traced to the migration of fruit-bats to human settlements. Also, being a host of various small rivers and backwaters, the coastal sand mining resulted in caving in of rivers and intrusion of sea water.

4. State-specific Sand Mining Rules & Manual Handling over Machinery Multiplication

In Tamilnadu, the law governing sand mining and other minor minerals is one from the mid-20th century (1950s) called the TNMMC rules with 3 metre mining limit for in-stream mining for sand. To preserve the river flow, its direction, bank stability and width, the Statute mandates 'manual mining'. Whereas the political climate influences Public Works Department's agenda in the form of sub-leases to mafias who use earth movers, bull dozers and dredgers depleting sand carpets, increasing coagulation, suspension, change in flow and direction due to area specific quarrying in one side of the river, affecting habitat of flora and fauna and resulting bio-diversity loss, aquatic eco-system, instability of banks thus completely altering the quality, physical and chemical properties of river water. Dredging of sand beyond permissible limits causes morbid downstream erosion along with down cutting by sediment-starved hungry water and upstream erosion in some areas due to the change in flow velocity, sinkhole formation in salt bed areas or limestone landscapes, thus deepening the excavation pits of inward mining. As per the Impact Assessment and Environmental Clearance laws of TamilNadu, no quarry shall be located within a distance of 750 metres to water tanks, pumps, bridges, reserved forests, sluice canals, etc. Quarry operations create potholed roads by continuous sand transport and dense air blinding vision, restricting breathing by too much suspended particulate matter.

5. Crippling Delay and Desertification

The half-a-century old mining legislations especially in the southernmost state Tamil Nadu with non-exhaustive measures or criteria to account for the hydraulic properties of river soil such as its conductivity, stability induction to the river and its banks, the geo-morphology of the riparian basins, drainage patterns, etc., are outdated and the States' reliance on them is a hydrologically challenged measure. Other states like Karnataka, Andhra Pradesh, Punjab, etc., are also affected by this phenomenon of degrading dredging and have started tapping into their scientific and technical sources to bridge the gaps and delays in its regulation as a measure to avoid desertification and dried out rivers.

As lucrative and as significant the business of sand mining and transport is for construction, the role of sand water retainer conserving some water to be used in non-monsoonal periods, groundwater recharge, strengthening of banks, alluvial deposits for agriculture in basins and all riparian states, protection of flora and fauna habitats, regulating water flow as a eco-balancer must be heavily prioritized. Laws are to be amended as per environmental and scientific guidelines and steps such as use of alternative sources like M-sand (manufactured sand) as proposed has to be encouraged and enforced through public action.

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