

# A STUDY ON BALANCING THE SUSTAINABLE DEVELOPMENT AND EXCAVATION OF RIVERBEDS FOR THE PURPOSE OF CONSTRUCTION AND DEVELOPMENT OF THE REGION

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## **Abstract**

*Rivers are the source of water and life. Since the ancient period we have seen the world's best civilizations being flourished and prospered near the rivers. Humans have been dependant on the rivers for not only fresh waters used for drinking but also for other purposes like agriculture, irrigation, washing and also for religious purposes. With the dawn of civilization not only the water from the rivers but also the riverbeds and riverbanks are used by the humans. However, with the wake of the urbanization, the landmasses of the rivers especially the sand, gravel, stones and boulders are being mined for various purposes like building homes, roads, transportation, renovation of buildings, construction of dams etc. This excavation or mining of the materials from the riverbeds is on unprecedented rise for one reason or the other as these materials are the important source for all forms of construction. Thus, the present paper is an attempt to study the balance between uses of riverbeds, its mining or excavations keeping in point of view the sustainability of the said materials so that development of the region can be done without causing any serious harm to the environment. The paper also studies the laws which are applicable to govern these issues. It also attempts at finding a way of maintaining a balance between preserving the natural resources which riverbeds provide us and its use for developing the regions.*

Key Words: Riverbed Mining, Excavations, Sustainability

**1. Introduction:** Rivers are considered as the source of water, life and fertility which has been reflected through various beliefs of multitude of cultures. The early civilizations like the Indus Valley Civilization, Ancient Egypt (on the Nile River), Mesopotamia (along the Tigris and Euphrates River) and Chinese Civilization (along the Yellow River) all were the early and important civilizations which emerged alongside riverbeds in the Third Millennium BC. Since the ancient period we have seen the world's best civilizations being flourished and prospered near the rivers. The reasons behind this is the easy availability of water, fertile land for farmland, good form of water transport for trading as well as river provides us with natural resources for a civilization to develop. Almost 65% of the water we drink comes from surrounding rivers. Humans have been dependant on the rivers for not only fresh waters used for drinking but also for other purposes like agriculture, irrigation, washing and also for religious purposes.

Since time immemorial humans are using rivers as well its riverbeds and riverbanks for various purposes. Riverbeds consist of materials which is required for developing civilization. These materials consist of sand, stones, gravels and boulders which are used in constructing building/homes, roads, dams, renovation of building etc. The excavation or mining of the materials from the riverbeds is on unprecedented rise for one reason or the other as these materials are the important source for all forms of construction. Everyday truck loads of sands, gravels, stones and boulders are extracted for one reason or the other. With the rise in the demand for quick urbanization of the regions (this consist of construction of roads and highways), real estates, high-rise apartments, dams, multi-utility projects and industries riverbeds are being excavated in a very large scale and often unregulated. The unregulated and large scale mining of the natural resources from the riverbeds and riverbanks causes environmental and social impacts.

**2. Effects of Illegal Mining in Riverbeds:** With the high demand in real estates and development of the region through easy connectivity, the construction of roads and high-rise buildings are being constructed which requires the natural resources we acquire from the riverbeds. Sands and gravel have been used since a very long period for construction of roads and buildings. As per the Geological Survey of India (GSI) the unprecedented rise in use of riverbeds natural resources has led to illegal and unscientific mining, in unsustainable and exploitative manner which has imposed threat to the environment. We can study the effects of illegal mining under the following two heads:

- (i) Effect on the River; and
- (ii) Effect on the People.

**2.1. Effect on the River:** The excessive riverbed mining and excavation which is often illegal and unsustainable has impact on the river. The Geological Survey of India (GSI) states that the excessive riverbed mining and excavation can cause alterations to the physical characteristics of rivers and its riverbed which can severely impact the ecological equilibrium of a river and damage plants, animals and riparian habitats which are found near those regions. Rivers carry a huge amount of silts and sand with them with is deposited in the river bed when river reaches to its lower course. Because of continuous deposition of sand in the river bed the depth of river decreases and thus it has to be mined to protect floods. But because of illegal mining, sand is mined in unsustainable and exploitative level and has created many ecological problems. Excessive riverbed mining can have plenty of impact on the river such as bed degradation, bed coarsening, lowered water tables near the streambed, and channel instability. It causes erosion and often leaves the river-plains more vulnerable to flooding because it allows loose landmass to be washed downstream especially during monsoons. The excessive mining and mixing of mud in the river with the discharge of chemical and oil during the process of mining can cause pollution which results in change in the color of water and makes it acidic. Some of the rivers are at the verge of extinctions due to the excessive riverbed excavation. The flora-fauna and the aquatic habitat of the rivers also get endangered due to excessive, illegal and unsustainable mining of the riverbeds. Degraded stream habitats result in loss of fisheries productivity, biodiversity, and recreational potential. Not only this it

also effects the fertility of streamside land which results in loss of valuable timber resources as well as the wildlife habitats in the riparian areas.

**2.2. Effects on the People:** The illegal and unsustainable mining on the riverbeds not only affects the river but it also effects the people living around it. It creates holistic pollution in air and water as well as sound pollution which may lead to different diseases to local people. Transportation of these materials requires heavy trucks which damages the roads and can cause communication problem in the area. It can also lead to shortage of drinking water as excessive mining can cause pollution to the water making it unfit for human consumption. It also leaves the river with insufficient amount of water as well as polluted water which is essential for irrigation facility in return affecting the farms and crops of people for example; in Tamil Nadu, uncontrolled river sand mining has led to the reduction of the groundwater by 91 m which could further turn the state into a barren land by 2050.

Illegal and unsustainable mining can cause erosion of land causing flood during monsoon which makes the adjacent areas of river unfit for residential purposes. It not only leaves impact on the habitat but also on the livelihood of the natives who depend on the agriculture due to the depletion of groundwater and destruction of farmland.

Thus, going through its impact on the rivers as well as humans it can be summarized that illegal and unsustainable mining of riverbed for the development of the region can impose threat on existence of the river, its natural resources as well as for the survival of the human beings too.

**3. Sustainable Development and Illegal Riverbed Mining In India:** Unsustainable and illegal riverbed mining and excavation can cause undaunted consequences which if we summarize is harmful to the human existence as a whole. It not only affects the physical characteristics of the river but it also has adverse effect on the survival of the living beings, humans included. Leaving apart the number of violent incidences occurred in various parts of India concerning the illegal mining of the river bed soon after the boom in the construction industry which accelerated since 2000, the sustainable use of the riverbed natural resources is the call of the moment.

The term “*Sustainable development*” means the development where we meet the present requirement without compromising on the ability and needs of our future generation. The modern concept of sustainable development is derived mostly from the Brundtland Report, 1987. The idea of sustainable development started from the sustainable forest management and the 20<sup>th</sup> century’s environmental concern. As it progressed it changed its focus on economic development, social development and environmental protection for future generations.

The sustainable use of riverbeds natural resources should be thought from this perspective as the unsustainable and illegal mining on riverbeds can cause excessive erosion in the river banks, extinction of flora and fauna on the rivers due to increase of sediments in the river making it murkier, degradation of land, reduction of groundwater recharge, pollutions of water etc.

In India various states are facing the problem of illegal mining of riverbeds along with its unsustainable use. Like in the State of Tamil Nadu illegal sand mining is done on the riverbeds, basins and beaches. Palar River Basin, Vaigai River Basin and Thamirabarani River, Basin are the major victim.<sup>1</sup> In *M. Palaniswamy v. State of Tamil Nadu*<sup>2</sup> it was found that the removal of more than 12 million tonnes of sand a year from the Vembanad Lake catchment has led to the lowering of the riverbed by 7 to 15 centimetres a year. It has also resulted in a loss of aquifer storage, increased flood frequency and intensity by reducing flood regulation capacity. The river bed mining when done in excess can cause lowering of the water table which can threaten the water supply causing draught and can also result in drying up of the rivers. Illegal sand mining has also caused erosion. Excessive mining and exaction also results in reduction of sediment delivery from the rivers to many coastal areas which in turn can lead to beach erosion. Similarly, in Kerala too sand mining is at its rampant on the beds of all its 43 rivers, their branches and tributaries. The major rivers of Kerala, Bharatapuzha and Periyar, which could be called as the life lines of Kerala are subjected to uncontrolled mining taking the water level to an unprecedented low.<sup>3</sup> The illegal sand mining can also be found in the riverbeds of Yamuna, Ghaggar, Tangri, Markanda, Krishnavati in the National Capital Region (NCR) which has not only caused pollution but also caused erosion, destroyed the vegetation and threatening the biodiversity.

Coming to the regional section, for the past one and half years we can see Asian Highway being constructed which aims at connecting three countries with India namely; Nepal, Bhutan and Bangladesh. “*This is a landmark project that will boost the connectivity with the neighbouring countries and friendship among the South Asian Association of Regional Cooperation (SAARC) Countries*” as per the Chief Minister of West Bengal Ms. Mamata Banerjee.<sup>4</sup> However, a complaint was filed by an environmentalist Subhas Dutta, the National Green Tribunal decided to stop the riverbed mining in North Bengal.<sup>5</sup>

**4. Towards Achieving Sustainable Development and Restriction on the Illegal/Unsustainable Excavations of Minerals from the Riverbeds:** In order to achieve sustainable development and imposing restriction on the illegal/unsustainable excavations of minerals from the riverbeds the efforts of the Government of India can be studied under the following heads:

- (i) Enactment of laws;
- (ii) Judicial Activism; and
- (iii) Policies issued by the Government (Central and State both).

1. *Illegal sand mining rampant in Palar basin* - The Hindu. October 10, 2013

2. 2012 (4) CTC 1

3. Noyonika Mukerji, *Illegal Sand Mining- Its effect on Ecology and Environ*  
<http://www.nluassam.ac.in/data3/lexterraissue23/Article%202.pdf> [Visited on 11<sup>th</sup> March 2019 at 11:25 am].

4. Shiv Sahay Singh, *Bengal Proposes road connecting State with three countries*, <https://www.thehindu.com/news/cities/kolkata/bengal-proposes-road-connecting-state-with-three-countries/article6081600.ece> [Visited on 04/05/2019 at 11:34 am]

5. *River mine bar halts Asian highways* [https://www.telegraphindia.com/1160908/jsp/siliguri/story\\_106937.jsp#.WMLFC2-GPIU](https://www.telegraphindia.com/1160908/jsp/siliguri/story_106937.jsp#.WMLFC2-GPIU) [Visited on 8<sup>th</sup> March 2019 at 02:00 pm].

**4.1. Enactment of Laws:** The *Constitution of India* under Article 21 provides for “No person shall be deprived of his life or personal liberty except according to procedure established by law.” The Article doesn’t directly speak about it but the right to clean environment is included under the right to life and the right to life includes the right of a human being to a living environment which is suitable for human existence. The Constitution of India also provides that “it shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures.”<sup>6</sup> The Constitution of India also provides that it is the responsibility of the State Government to protect and improve the environment and to safeguard the forests and wildlife of the country.<sup>7</sup>

The Government of India under *the Mines Act 1952* in relation to the mining of riverbeds provides that any mine engaged in the extraction of kankar, murrum laterite, boulder, gravel, shingle, ordinary sand, ordinary clay, building stone, slate, road metal, earthy fullers earth, marl chalk and lime stone the working do not extend below superjacent ground: or where it is an open cast working –(a)the depth of the excavation measured from its highest to its lowest point nowhere exceeds six meters; (b)the number of persons employed on any one day does not exceed fifty; and (c)explosives are not used in connection with the excavation.<sup>8</sup>

With a view of undertaking the control over the regulation of mines and the development of the minerals the Union Government enacted *the Mines and Minerals (Development and Regulation) Act, 1957*. It provides that no person shall undertake any reconnaissance, prospecting or mining operations in any area, except under and in accordance with the terms and conditions of a reconnaissance permit or of a prospecting license or, as the case may be, a mining lease, granted under this Act and the rules made there under.<sup>9</sup> It also provides that where the Central Government, after consultation with the State Government, is of opinion that it is expedient in the interest of regulation of mines and mineral development, preservation of natural environment, control of floods, prevention of pollution, or to avoid danger to public health or communications or to ensure safety of buildings, monuments or other structures or for conservation of mineral resources or for maintaining safety in the mines or for such other purposes, as the Central Government may deem fit, it may request the State Government to make a premature termination of a prospecting license or mining lease in respect of any mineral other than a minor mineral in any area or part thereof, and, on receipt of such request, the State Government shall make an order making a premature termination of such prospecting license or mining lease with respect to the area or any part thereof.<sup>10</sup>

In 2010 the Parliament enacted *the National Green Tribunal Act*. Its main aim is to establish a National Green Tribunal for the effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to

6. Article 51-A(g), *The Constitution of India*.

7. Article 48-A, *the Constitution of India*.

8. Section 3(1)(b), *The Mines Act, 1952*.

9. Section 4, *The Mines and Minerals (Development and Regulation) Act, 1957*.

10. Section 4A, *The Mines and Mineral (Development and Regulation) Act, 1957*.

environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto.

#### 4.2. Judicial Activism:

For the purpose of attaining sustainable development through sustainable mining and excavation of riverbeds the Supreme Court in the case of *Deepak Kumar v. State of Haryana and others*<sup>11</sup> had directed all Union Territories and State Governments to seek Environmental Clearances (EC) from Ministry of Environment, Forest & Climate Change (MoEF&CC) for mining minor minerals even in less than 5 ha or renew the same after prior approval from the MoEF&CC. Before this order, mining areas of less than 5 ha were exempted from EC enacted under [Environmental Impact Assessment \(EIA\)-2006](#). In the aforesaid case, there was an auction noticed issued by the Department of Mines and Geology, Government of Haryana restricting the quarrying of minor mineral, road metal and masonry stone mines in the District of Bhiwani; Stone sand mines in the District of Mohindergarh,; slate stone mines in the District of Rewari, and also in the Districts of Kurukshetra, Karnal, Faridabad and Palwal in the river beds of Yamuna, Tangri, Markanda, Ghaggar, Krishnavati River Basin, Dohan River Basin etc. The validity of those auction notices were challenged, apart from the complaint of illegal mining going on in the State of Rajasthan and Uttar Pradesh.

In the *National Green Tribunal Bar Association Vs. Ministry of Environment & Forests & Ors*<sup>12</sup> the contention was that large scale illegal and impermissible mining activity is going on, on the bank of Yamuna, Ganga, Chambal, Gaumti and Revati amongst others. This removal of minerals from the river beds is causing serious threat to the flow of the river, forests upon river bank and most seriously to the environment of these areas. All these 3 aspects are covered under Schedule – I of the National Green Tribunal Act, 2010 (NGT Act, 2010). It is further contended that in terms of the Orders of the Hon'ble Supreme Court of India in the case of *Deepak Kumar Vs. State of Haryana*, even the person carrying on mining activity in less than 5 hectares, are expected to take EIA Clearance from MoEF/SEIAA. Thus the Tribunal restrained any person, company, authority to carry out any mining activity or removal of sand, from riverbeds anywhere in the country without obtaining Environmental Clearance from MoEF/SEIAA and license from the competent authorities. All the Deputy Commissioners, Superintendent of Police and Mining Authorities of all the respective States are directed to ensure compliance of these directions.

In the case of *Himmat Singh Shekhawat Vs. State of Rajasthan and others*<sup>13</sup> the National Green Tribunal held that there will be violation of laws if the sand mining in the riverbed of Yamuna will be held without taking prior Environmental Clearance. Similarly in *Pradeep Vs. Union of India & Others*<sup>14</sup> the National Green

11.(2012) 4 SCC 629; AIR 2012 SC 1386.

12.Original Application No. 171 of 2013, 5<sup>th</sup> August, 2013.

13. O.A. 123 of 2014, Dated 13<sup>th</sup> January 2015.

14.NGT (Uttar Pradesh) dated 15/03/2016

Tribunal directs the authorities to ensure that no mining activity of minor minerals is permitted in any area covered under the Judgment, and the concerned Officers shall be personally responsible for compliance of the Judgment dated 18<sup>th</sup> February 2016 in the case of *Gurpreet Singh Bagga Vs. MoEF & Ors*<sup>15</sup> In the *Social Action for Environment & Forest vs. Union of India*<sup>16</sup> the report was submitted showing illegal mining being carried out at Haridwar. The case was related to mining going on banks of river Ganga and its tributaries. Similarly in *Enviro-Legal Action vs. National Ganga River Basin Authority*<sup>17</sup> the NGT the following directions were issued regarding mining on river bed on river Ganga including Haridwar:

- (a) The riverbed mining would be carried in highly regulated manner under strict supervision of the authorities concerned.
- (b) No mechanized river mining would be permitted. No JCBs would be permitted to operate in the river bed.
- (c) No suction of minerals would be permitted from river or river beds by mechanical process like suction pumps.
- (d) The regulated mining would include regulating of seasons of mining which would be strictly adhered to.

**4.3. Policies issued by the Government:** In compliance to the orders by the National Green Tribunal and the High Court in several States to facilitate sustainable river sand removal various policy initiatives were enacted along with the environmental and pollution control legislation to prevent indiscriminate exploitation of natural resources and to promote integration of environmental concerns in developmental projects by the Government. One such Policy was issued by the Ministry of Environment Forests (MoEF) called *the Environmental Impact Assessment Notification (EIA) 2006*, on 14th September, 2006. An environmental impact assessment (EIA) is an assessment of the possible impact, positive or negative-that a proposed project may have on the environment, together consisting of the natural, social and economic aspects. Its purpose is to identify, examine, assess and evaluate the likely and probable impacts of a proposed project on the environment and, thereby, to work out remedial action plans to minimize adverse impact on the environment. It is an important management tool for ensuring the justified use of natural resources during developmental process. It makes prior Environmental Clearance mandatory for the development activities listed in its schedule. Along with this the Union Ministry of Environment and Forests also formulated *the Sustainable Sand Mining Guidelines 2016*. The main objectives of the guidelines is to ensure that sand and gravel mining is done in environmentally sustainable and socially responsible manner; availability of adequate quantity of aggregate in sustainable manner; improve the effectiveness of monitoring of mining and transportation of mines out material; conservation of the river equilibrium and its natural environment by protection and restoration of the ecological system; avoid aggradations at the downstream reach especially those with hydraulic structures such as jetties, water intakes etc; to ensure the rivers are protected from bank and bed erosion beyond its stable profile; no obstruction to the river flow, water transport and restoring the riparian rights and in-stream habitats; to avoid

15. O.A. 184 of 2013.

16.O.A. 117 of 2015.

17.O.A 10 of 2015.

pollution of river water leading to water quality deterioration; to prevent depletion of groundwater reserves due to excessive draining out of groundwater; and streamlining the process for grant of Environmental Clearance (EC) for sustainable mining. The recommendations for management of sustainable sand extraction are the key objectives of the guidelines.

**5. Suggestions on Attaining the Sustainable Use of Riverbeds:** Although in India we have lots of Courts decisions, laws and policies with respect to the excavation/mining of riverbed for its natural resources yet we see that these regulations are often not followed properly or are just plain paper tigers resulting in illegal mining which can give rise to other kinds of law related problems too. Thus, it becomes essential for us to seek out strategies to sustainable management of extracting natural resources from the river bed to escape any natural hazards and ensure the safety and well-being of the society through adopting alternative sustainable methods for the economic development without compromising on the cultural, social and environmental outcomes and values.

Roads are the main stream for development of a region, as it helps us to transport materials and a fast means of communication as it connects one region from another. However, in order to construct it loads of sand, gravel, boulders etc are needed which are natural resources and have to be excavated through mining from riverbeds. Instead of using the whole natural resources we can use the waste materials which we throw every day. Like we can use plastic wastes which can neither be decomposed nor can be disposed off easily. The successful experiment was done by Prof. Rajagopalan Vasudevan, Professor of Chemistry at Thiagarajar College of Engineering, Madurai. He is also known as “Plastic Man.” As per him *“The advantages of using waste plastics for road construction are many. The process is easy and does not need any new machinery. For every kilo of stone, 50 gms of bitumen is used and 1/10<sup>th</sup> of this is plastic waste; this reduces the amount of bitumen being used. Plastic increases the aggregate impact value and improves the quality of flexible pavements. Wear and tear of the roads has decreased to a large extent.”*<sup>18</sup> The said method is termed as waste recycling. Another method is that there are large dumping grounds near residential areas which are stinking garbage causing nuisances and health hazards to the public. Although a little fund is required by the Government towards the treatment for making it usable but it can be used in constructing the roads as huge amount of gravel and sand is required to build highways and roads.

Apart from the laws and policies, the Government should also concentrate in providing workshops /raining/sensitizing the core groups who are into the excavation/mining of the riverbeds about the hazards the excessive mining of the riverbeds can result in. The Government should also make programmes in sensitizing the natives in and around the riverbeds about the illegal mining and excessive mining.

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18.Aparna Menon, *Roads made of Plastic Waste in India? Yes! Meet the Professor who Pioneered the Tech* <http://www.thebetterindia.com/43685/plastic-waste-in-road-construction-plastic-man-india-prof-vasudevan/> [Visited on 13<sup>th</sup> March 2019, 12:12pm].



Riverbed farming is another solution which is being practiced in the Terrai regions of the Himalayan States in India. The proper orientation programmes to the farmers should be provided in order to prevent floods due to excessive excavations.

The use of alternative materials like the Copper Slag, Granulated Blast Furnace Slag, Bottom Ash, Foundry Slag, Construction and Demolition Slag, Manufactured sand etc. should be encouraged and programmes should be arranged for the contractors by the Government.

The legislations should be amended to give maximum amount of power to the enforcing authorities to implement the law and punish any defaulting parties. The absence of such power renders the authority useless.

Lastly but not the least, the protection of the environment as envisaged by the Constitution of India as well as the legislations and the policies of our country, should be the concern of the whole citizens as the existence of human, animals and plants depend on the careful use of the natural resources which we should not forget for the capital gain.

