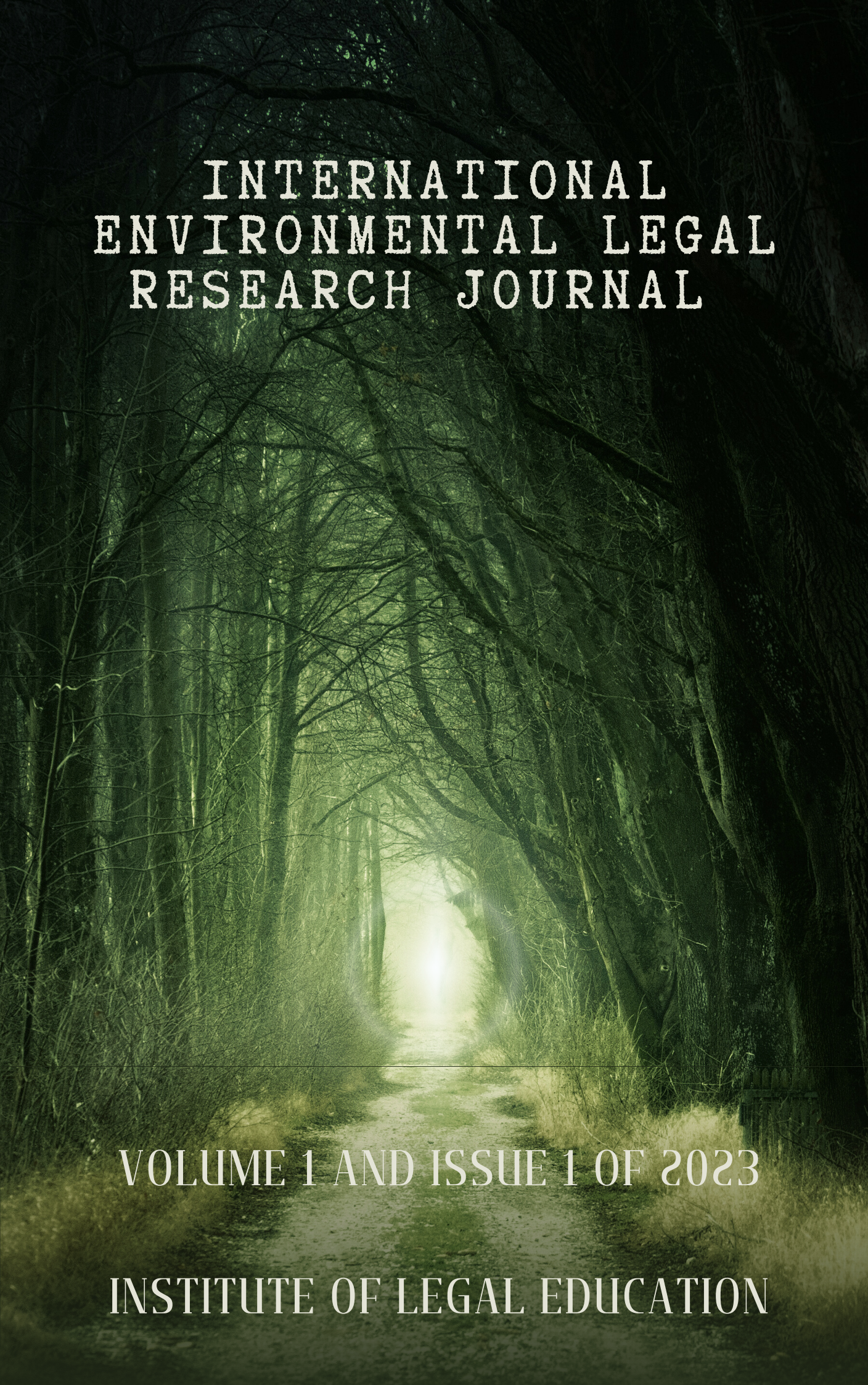

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ECOLOGICAL ISSUES WITH ILLEGAL SAND MINING IN INDIA AND LAWS RELATED

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Abstract

Earth is rich of many resources hidden inside it and Mining is a key to extract those resources. One such major resource used by humankind is sand. Sand is a basic but majorly used natural resources across globe. This paper tries to shed light on sand mining and the effects on the ecosystem due to excessive sand mining in Indian context. The paper tries to understand the effects of excessive sand mining through illegal sand mines across India and how the laws and provisions in India are trying to control them and minimize the already caused damage to the ecosystem. The paper also talks about various legal frameworks for sand mines and analysis them. Also, pointing the failures of Indian authorities in controlling the illegal sand mines in India.

Keywords: Mining, Environmental Imbalance, Sand Mines, Sustainability, Excessive extraction

Introduction

From the time of dawn, human has been dependant on earth and its many resources. Through years human has evolved and grown in numbers. They evolved and brought many new innovations and the purpose of natural resources has been increased with time and with growth of numbers with human population. More the people, more the requirement of natural resources. So, humans have opted to extraction of resources. Extraction of resources means drawing out of natural resources from the earth. Natural resources include fossil fuels (oil, gas, and coal), minerals, fishing, and soil. Through the time the human has continued to increase the rate at which they extract, as their requirements have increased with time and population. The increase of requirement has led to increase of extraction of resources. Due to developments and growing standards of living with technological advancements the level of extraction has also been increased. Now, the humans can extract natural resources from miles underground and remote areas where a normal human cannot reach.

Sand or soil is one such natural resource which is a major requirement by the human. Also, this is a resource for human development and it is a part of earth's core. Excessive sand extraction will lead to the destruction of habitats, ecological imbalance, there will be decreasing soil quality. Sand Mining can destabilize soil, increase erosion, and reduce the nutrient levels in ground. Increasing erosion can also decrease water quality by increasing sediment and pollutants in rivers and streams[1].

Statement of problem

Sand is said to be one of the most used natural resources on earth. This makes sand have a good demand margin in market, which is the reason for many illegal mines across India and it leads to a lot of ecological issues. How can this be altered and help in restoring the ecological balance in India?

Objective of the study

- To understand the ecological effects due to excessive sand mining.
- To Analysis the Laws and provisions catered towards sand mining in India.

[1] 'Sand Mining' (ENVIS Centre on Environmental Problems of Mining)

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- To learn about the illegal mines in India and provide reasonable remedies.

Review of Literature

- **Sand mining: the environmental challenges you've probably never heard of (world economic forum).** This report by World economic forum is an informative writing on the environmental challenges faced due to excessive sand mining. This report tries to give the reader an overview on the unheard ecological issue caused and how troublesome these ecological changes can be. The report also talks about the sustainable development and how to control the damage done by excessive sand mines across India.
- **Sand Mining: The global environmental crisis (The Guardian).** This article is genuine work by the author. The article talks about the environmental crisis across the world due to sand mining. The article tries to shed light on the global issues with sand mines and how it will affect the land and its fertility and tries to suggest some idea for a sustainable way to mining the sand, which may reduce the damage caused by sand mines.
- **Mines, Mafia, and the demand for Sand (Live Mint).** This article majorly focuses on the illegal mines and how a sand mafia has born out of many illegal sand mines in India. This article talks about illegal sand mines and how the government authorities are trying to get rid of these illegal sand mines from a long time and failing to do it. The paper does just talk about the illegal sand mines across India, but also the reason behind it. Article goes on to say, main reason for these illegal sand mines is the demand of sand as a resource.
- **Why Unlawful sand mining in India needs good governance (Down to Earth).** This article is criticism on the Indian government authorities in handling the matters of unlawful sand mines which are spread across India. The article tries to educate the reader how Indian governance has been failing in controlling the unlawful sand mines in India**.**
- **India still miles away from sustainable sand mining, voices from Thottappally, other coasts need to (Onmanorama).** This Article is decent work on the concepts of sustainable development in matters of sand mines. The work contains all about major Indian sand mines and how they are affecting the ecosystem of India in a long run. Also tries to gives some criticism on how India is falling behind in matters of sustainable sand mining. The author tries to give the reader a good understanding about sustainable sand mining and its positive effects on environment.
- **Resource extraction (Understanding Global Change, 2022).** This article is decent work by the author on extraction of natural resources from earth. The article sheds light on the extraction process of minerals and aftermath effects caused due to the extraction. Also, about the environmental aspect involved due to mining or extraction of resources across the world.
- **Sand Mining (ENVIS Centre on Environmental Problems of Mining).** This online portal gives the reader a clear understanding of the concept of sand mining. It talks on various things related to sand mining. From the demand of sand for various reason to the excessive extraction of sand which is affecting environment and also tries to give some remedies to short down the sand mines.
- **Podila Sankara Pitchaiah, 'Impacts of Sand Mining on Environment – A Review.'** The journal article is a pioneer

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work on sand mines and its effect on environment. The author clearly explains the reason behind excessive sand mining and then goes on to state the effect on environment due to excessive sand mining. The author in a simple way explains the whole economics behind the excessive sand mining and how sand is one of the most required natural resource. Finally, the author gives few of the alternatives which can be substituted with sand for their requirements.

Scope of the study

The paper majorly focuses on the illegal sand mining in coastal states of India and its effects to the ecological imbalances and talks about the Indian regulations and laws regulating the sand mining sector in India.

Research methodology

The research method used to draft this research paper is Doctrinal Research Method. In this research paper mostly, secondary sources were used like online articles, blog and online journal, news articles and legal writing.

Research question

1. Why does the Indian laws and provisions regulating sand mining are failing to control the illegal sand mines?
2. What is the Criteria and procedure under Indian law to get sanction for Sand Mining?

Hypothesis

Restoring the ecological balance can be happened through adopting many sustainable ways of sand mining and by affective application of laws and provisions to control illegal sand mines in India.

Sand Mining: An Overview

As earlier stated, requirement of sand as a natural resource is increasing. With growing world, there is improvements of infrastructure as per the requirement of the contemporary needs. For the upgrades and additions to infrastructure and making them possible the major need is of sand. The usage of Sand in construction and infrastructural development is excessive. In the making process of concrete, for every tonne of cement, and construction industry has a lot of requirements for sand. This labels Sand as an important resource and mineral for the structural development of the society.

Here we need to understand that sand is a naturally formed powdered substance, which is composed of tiny rock and mineral particles[2]. And it has become a very important natural resource for people, because of its so many uses. Sand is used in making of concrete, construction of roads and building, in brick-making process, etc. If we see from the perspective of structural development of the world and many countries, the role of sand is very much important. In contrast to that sand also plays a much more important role in protecting the costal environment. It acts as a soft shield against strong tidal waves by taking their impact and reducing the impact taken by the main land. Sand is also a habitat for many marine animals and living things. Through various reports on average, one individual uses over 200kg of sand per year. This sand is taken from what are essentially non-renewable resources.

Mining of Sand more frequent than any other material or natural resource, we can consider that sand is mined far more frequently than any other minerals and metals both combined. Sand, gravel stones, or other average materials make up somewhere more than 75% of the material we take out from the earth. Sand is used in mostly everything. In every building or

[2] 'Sand Mining' (ENVIS Centre on Environmental Problems of Mining)

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structural operation, and which makes it the 2nd most used resource after water.

Around the world, the usage of sand is over 53 billion tonnes per annum, which turns to be equalient to a single person using 20 kg of sand daily. The requirement of sand is also going up due to the raise in urbanisation across the world, in specific East Asia, where China has been a major consumer of sand. This has been the case for every 3yrs since the early 2000s which is more than the USA's consumption of sand during the entire 20th century.

Sand acts as a blanket to the earth. The worlds largest desert, which is Sahara Desert in African continent will alone make up to approx. 8% of the earth's surface area, which makes it roughly the similar in size to China country. The Sand like hills, which are referred as sand dunes in Sahara Desert are of approx. 180 metres in heights. Also. the Sahara desert is only one of many deserts in the planet, and there is, to put it gently, a lot of sand there.[3]

Even with a huge amount of sand scattered across the deserts, the desert sand has one drawback of being almost useless. Desert sand is considered to be useless. The grains of desert sand can no longer be worked and mixed well into concrete, which is the main purpose for sand to be harvested and used. A vast majority of the harvested sand is used for the purpose of concrete. The desert sand is useless because they have been shaping out by the winds and slowly gaining a form of smooth and rounded.

For the purpose and utilizing sand for the purpose it has been extracted for will require the sand to be sharp, angular grains of sand and these will be found only in river shores, river banks, and riverbeds. Silica sand, this sand is boiled down to a boiling point and melt it then use to create glass for windows, windshields, and also for the screen glass of smartphone displays, may be found here.[4] We are so hungry for that material that entire islands are disappearing from Indonesian maps, ecosystems are being decimated, and coastlines are eroding.

Extreme sand mining and its effects on ecosystem

There is no doubt that human activity has a negative impact on the environment, and it does so globally. Sand mining causes land to be lost due to coastal or river erosion, lowers the water table, and reduces the amount of sediment supply. The volume being removed is having a significant impact on rivers, deltas, and coastal and marine ecosystems. Table 1 lists a few of the impacts that have been noticed. The effects of extraction can be seen in the terrain, climate, water turbidity, biodiversity, and water table levels. Additionally, there are political, cultural, and even socioeconomic drawbacks. The issue has gotten to the point where several river ecosystems are in danger, with tiny river catchments suffering the most harm. The same holds true for dangers posed by marine exploitation to benthic ecosystems. Marine aggregate mining has occasionally altered international borders, as seen with the disappearance of Indonesian sand islands.[5] The mining of sand also affects the climate. It has a direct effect by emitting greenhouse gases during both the mining operation and the sometimes-lengthy transport of the extracted commodities. It also has an indirect effect from the production of cement, which is used in concrete along with sand and stones. Due to this on average, 0.8 ton of carbon dioxide is produced for every tonne of cement.

Approximately 5% of all greenhouse gas emissions, or 165crs of tonnes of Co2, were attributed to the manufacture of cement in 2010, and the total carbon emissions from cement are predicted to be 30cr tonnes of CO2.

[3] Christina lu, 'The Great Sand Grab' (Foreign policy)

[4] Sand mining: the global environmental crisis' (The Guardian)

[5] Kate whiting, 'Sand mining: the environmental challenge you've probably never heard of' (World economic forum)

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Undoubtedly, the lack of global aggregate extraction monitoring leads to the knowledge gap and the consequent inaction. Though the effects of substrate mining are hidden, they are enormous, and the mining of marine aggregates is growing significantly. Seabed vegetation and animals are impacted by marine sand mining.[6] Benthic (sea bottom) zone dredging and aggregate exploitation harms animals, habitats, and ecosystems. It has a significant impact on biodiversity composition, frequently resulting in a net decrease in faunal biomass and abundance or a change in species composition. Only when the original sediment composition is being restored can long-term recovery take place. Dredging boats reject aggregate particles that are too small to be useful, producing enormous dust plumes and altering the turbidity of the water, which has a significant impact on aquatic environments across a wide area. Sand removal directly from beaches, primarily through illicit sand mining, is a major cause of erosion. Sand traffickers in Morocco turned a sizable beach into a rocky environment. Additionally, indirect erosion can result from near-shore marine dredging for aggregates, or as a result of sand mining in rivers.[7]

The delivery of material from rivers to many coastal locations has been slowed down by damming and mining, which has hastened beach erosion. Long-term erosion of up to 1.5 metres per year has also been linked to on-shore sand mining in coastal dune systems. Small island states, where there are few options for retreat, are particularly vulnerable to the global average sea level rise, which is projected to reach 0.25 to 0.5 metres by 2100 under the best-case scenario (of a 70% reduction in greenhouse gas emissions). Sand is being imported in large quantities for use in taller tower construction and coastal protection in the Maldives in order to fortify Male, the nation's capital. Sand islands off the coast are where the sand is taken. Ironically, the sands removed for Male's safety measures are causing these other islands to sink, necessitating more human relocation.[8] Sand mining has caused the Lake Poyang channel, China's largest freshwater lake and a reserve of great importance for biodiversity, to deepen and widen as well as increased water discharge into the Yangtze River. This may have contributed to the lake's water levels dropping, which in 2008 reached a historically low level. The mining of aggregates in rivers may contribute to pollution and alter the acidity of the water. Rivers that have had their sediment removed make channel incisions through the valley floor both upstream and downstream of the extraction location. This causes the bed material to become coarser and the lateral channel to become unstable.[9] The riverbed itself may shift as a result. Aquifer storage may be lost if an incision causes the tidal groundwater to drain to a lower level. By decreasing flood regulation capacity, it can also lead to an increase in flood frequency and intensity. Water supply is most at risk from decreasing the water table, which worsens drought severity and frequency as tributaries of major rivers dry up when sand mining activity hits certain thresholds.

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[6] D Padmalal and K maya, Sand Mining Environment Impact and Selected Case Studies

[7] Podila Sankara Pitchaiah, 'Impacts of Sand Mining on Environment – A Review' (SSRG intl. Journal)

[8] D Padmalal and K maya, Sand Mining Environment Impact and Selected Case Studies

[9] Kate whiting, 'Sand mining: the environmental challenge you've probably never heard of' (World Economic forum)

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Sand removal directly from beaches, primarily through illicit sand mining, is a major cause of erosion. Sand traffickers in Morocco turned a sizable beach into a rocky environment. Sand mining in rivers and near-shore marine dredging of aggregates are two more indirect causes of erosion. The delivery of material from rivers to many coastal locations has been slowed down by damming and mining, which has hastened beach erosion. Long-term erosion of up to 1.5 metres per year has also been linked to on-shore sand mining in coastal dune systems.[11]

Sand mining's effects are of various. The backwaters and beaches in regions of coast are known by many for their eye-catching view. This is on of the money and economy generator. In these regions, Tourism focused around the beaches and seashores and these are few of main key sectors for economic growth. When it comes to trading many harbours and many commercial zone and hubs will be found in these coastal areas. Due to the sand mining, there are very lesser chances of visibility of the beauty to us anytime soon. Secondly, Beach erosion is one such effects of snd mining in costal areas. Wherever sand is extracted or mined, the residents of those areas or coastal areas where the sand mining is going will have or faced by constant risks from the big tides of the sea. The destruction of the Properties is brought on by coastal erosion fuels.[12] The reason for coastal erosion is that sand extraction from beaches, which will expose coastal areas to erosion problems. Also, Radiation will be occurred due to sand mining, The by-product of radioactive minerals like monazite and zircon, which is harmful to the local flora and fauna.

Also, one of the effects on environment is dust pollution. A bigger quantity of dust starts to enter into the atmosphere while extracting sand or mining the sand from the earth's crust. And this will cause and lead to respiratory disorders. And we cannot the major issue with mining in general, which is Noise. Noise and vibrations of Noise is an issue for areas surrounding the mining areas, this is because huge equipment the mines are used to extract and generally mines are functioning around the clock every day and the sound levels fluctuate widely. Due which the surrounding areas of mines are affected with the noise pollution. Not just human around the mines but also many animals and creatures which are sensitive to loud sound. And during the transport of sand from mining site to other place through roadways will create a vibration of sounds with the movement of heavy vehicles which causes damage to roads and bridges and sometimes cause traffic hazards.

Amaravathi River, Tamil Nadu, India

Near Amaravathi River, where there are many tea gardens, high altitude denudation took place. The ability of ground water to be recharged during the rainy season and discharged to surface water during the dry season is lost as vegetation is cleared away and replaced by tea plants. Because there will not be any groundwater storage, this will increase surface flow during wet days, thereby drying up minor streams.[13]

Pampa River, Kerala, India

[10] Kate whiting, 'Sand mining: the environmental challenge you've probably never heard of' (World economic Forum)

[11] Podila Sankara Pitchaiah, 'Impacts of Sand Mining on Environment – A Review' (SSRG intl. Journal)

[12] Resource extraction' (UNDERSTANDING GLOBAL CHANGE, 2022)

[13] D Padmalal and K maya, Sand Mining Environment Impact and Selected Case Studies

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Due to ongoing sand mining, water flow via Pampa River tributary called Ithipalliyar, which is frequently obstructed once the level of the main riverbank is fallen. The riverbed, which was covered in a thick sheet of sand that was 15-20 feet thick and that layer of sand covers the entire width of River of Pampa, but it has already vanished. Many areas of the riverbed of pampa river are collapsed due to sudden fall in the riverbeds and the loss of sand from beneath the top soil at the river embankment.[14]

Kerala coast (India)

Due to sand mining, low-lying areas become flooded during the monsoon, and are primarily covered by seawater. The predominant crop on most of these regions is rice. There are many bodies of water, usually brackish. Through several channels and canals, Ashtamudi kayal and Vembanad kayal, two RAMSAR sites that border the Kayamkulam kayal, are well connected. This vast, continuous swamp is 1.5 metres below sea level for the majority of it. Seawater intrusion would inundate the land and impact ground water once the narrow strip of shoreline that shields this area from the seawater is cut off. The districts of Kollam, Alappuzha, Pathanamthitta, Kottayam, and Ernakulam are experiencing a negative chain reaction.[15]

Alappuzha (Kerala, India)

Alappuzha's coastline is heavily populated by fishing communities. The area is currently under risk brought on by sand mining. The region is recognised as one of the most prolific and promising fishing grounds in the world.

The population of the area that depends on coir and coir products is impacted by sand mining. It takes a long time to remove coir from the husk, and brackish water is needed to treat and soften it. The physicochemical state of the water is important for this procedure because changes in it could have an impact on the coir strands' quality. Once mined, the area's backwaters will be exposed to the sea to a greater extent, affecting the physico-chemical characteristics of the water. Many families lost their active lifestyle or source of income.[16]

Illegal sand mines in India

Sand mining can be considered as a major problem in a country India. Due to many unlawful mining activities around the country, this illegal mining has created its own criminal establishment. Through their unlawful mining practices, they have exploited lakhs of tonnes of sand in open air. Many riverbanks and such area are now turned into mining sites. As per the Surveys conducted around the country, these unlawful mining is having a significant impact on the environment.[17]

China and India are the key hotspots for sand mining, according to the United Nations Environment Programme, as they are also the world leaders in infrastructure and building. Natural replenishment rates are significantly outpacing extraction rates. The golden sand of the Sone is thought to be of the highest calibre and is in great demand.

The extent of sand mining in Bihar is not publicly known. According to a senior officer of the Bihar State Pollution Control Board who spoke on the condition of anonymity, "We have no record of the precise area under sand mining, how much sand is extracted in the state." Despite repeated assertions by police and Mines and Geology Department officials that they have clamped down on such businesses, a sizable chunk of the business is unlawful.

[14] D Padmalal and K maya, Sand Mining Environment Impact and Selected Case Studies

[15] D Padmalal and K maya, Sand Mining Environment Impact and Selected Case Studies. journal)

[16] D Padmalal and K maya, Sand Mining Environment Impact and Selected Case Studies

[17]D Padmalal and K maya, Sand Mining Environment Impact and Selected Case Studies

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Regardless of the ban, a top officer at the Mines and Geology Department acknowledges that daily unlawful sand mining occurs in rivers throughout the state. Due of close ties between cartels and local politicians, contractors, criminals, and administrative authorities, including the police, the extraction is on unchecked, he adds.

According to S Chandrasekhar, member secretary of the Bihar State Pollution Control Board, this "nexus" of strong individuals is what fuels large-scale illegal sand mining, which is a considerable source of income without the need for a lot of investment. As a result, the state exchequer suffers a significant revenue loss and the resource is being overused. "Stopping illegal sand mining is difficult because everything is driven by money. The sand mafia is powerful and wealthy, according to Chandrasekhar.

Anand Prakash, the district mining officer for Bhojpur, reports that in the last three months there have been 133 police complaints, 58 arrests, and the seizure of 1,123 cars and more than 600,000 cubic feet of sand. However, there are numerous claims of police collusion. Some illegal sand industry contractors claim that the Sonepur police station was given Rs 8–Rs 9 lakh per day to allow more than 150 laden trucks to pass via Pahleja Ghat.

Sand mining issues in India are revolving around the efforts that are put into curb illegal mines across the country. There has been Several steps took by various Governments of the state to monitor and cut down illegal sand mines in their geographical radius. We can consider 2 aspects to identify a mining as Illegal sand mining in sand. Firstly, unlawful extraction from the unauthorized areas and unlawful extraction over the permissible limits. Most of the cases which are registered under unlawful mining are related to unlawful transportation, the mobilization of sand is done with no valid permit. In another case of unlawful mining is where sand is transported unlawfully from one State to other state, if there is ban on sand transportation between those states.[18]

Sand cannot be transported from one State to another primarily to prevent supply shortages in the home State and escalating sand costs. However, the state governments may take into account sand transportation across states if they see the country's sand shortage as a whole. By restricting sand sales to online portals alone, the worry of States regarding the host State's unmet sand need can be addressed. Sand will only be sold through an online portal, so everyone who needs to buy some must pay the same price to the lessee there, whether they live in the host State or a neighbouring State. The States should also make sure that the lessee is not motivated to supply sand to customers in other States rather than those in the host State.

Indian laws and provision regulating sand mining

Guidelines from the Ministry of Environment, Forests and Climate Change are sent out the to monitor and check unlawful sand mines in India. Now, Sustainable Sand Management Guidelines, 2016 is looking after the management of sand mines across the country. Due to increase of unauthorized and illegally set up sand mines across the country and this made a need to have guidelines that can effectively enforce the regulatory provisions and monitor any kind of sand mines related matters. The Guidelines gave in 2020 are to be enforced simultaneously with the SSMG, 2016, in case of conflict, the new set will hold legal precedence. The state government hs tge power to make rules to prevent illegal mining, transportation, and storage of minerals under the Mines and Minerals (Development and Regulation) Act, 1957[19].

[18] 'Resource extraction' (UNDERSTANDING GLOBAL CHANGE, 2022)
[19] Divyansh upadhyay, 'Why unlawful sand mining in India needs good governance' (Down To Earth)

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As said earlier, there are many illegal mining cases across the country and there are some instances where in some cases, many government officials lost their lives while executing their duties against illegal mining. These Illegal and unauthorized mining will not just lead to loss of revenue to the State government, but also damages the environment.

As per the constitution of India and the provisions mentioned in there will provide some basic structure of laws for sand mining. In State List (list 2) of the Indian Constitution states and gives the state an authority to control and the minerals located in their states. And in Central list states that the central government has authority to own the minerals within the exclusive economic zone (EEZ) of India[20]. In pursuance to this Mines & Minerals (Development and Regulation) (MMDR) Act of 1957 was framed. Also, the Central Government has the power and authority to notify and declare some minerals as 'minor' minerals from time to time for which the absolute powers for deciding on procedures of seeking applications for and granting mineral concessions, fixing rates of royalty, dead rent, and power to revise orders rest only with the State Government. For minerals specified in the First Schedule to the Mines and Minerals (Development and Regulation) Act, 1957 approval of the Central Government is necessary.[21]

In enforcement and monitoring guidelines of 2022, there are aspects which will monitor and inspect sand mines. The new guidelines which focus on the effective monitoring of sand mining from start to the very end. From identification of sand mineral sources to the dispatch and end-use by consumers or commoners and come up with a singular protocol for the entire country. Also, government can keep an eye on sand mines by constantly monitoring over the mining with the help of drones and night surveillance of mining activity through night-vision drones. There should be a factor of Transparency in Online sales and purchase of sand and other riverbank materials.

Sand mining has a greater impact on the ecology, which will negatively affect rivers, plants, and animals. The supreme court of India declared in February 2012 that all sand mining activities, regardless of whether the area is less than 5 hectares, require authorisation under the Environment Impact Assessment (EIA) notification of 2006.[22] Sand was being illegally mined, works were on going during the monsoon, and mining machinery and equipment that were declared illegal were used. These are the basic characteristics of illegal sand mining. Due to the unlawful construction of storage docks, roadways, and few other structures to assist simple extraction and transportation of sand from the riverbank, even mangrove forests had been devastated. Due to which, these cities like Mumbai and others are vulnerable for floods.

Few measures are in action by Kerala government to cut down illegal sand mines, Tahsildars of there areas are guided to do raids, and bring any such unlawful acts to the notice of regional collector and then take hold of the vehicles carrying sand. Around the clock, the public can register complaint regarding illegal and mining in the district, for which call complaints were added. The public interest litigation (PIL) lawsuit asking the state government to require the use of manufactured sand as an alternative to river sand in mostly construction activities has been dismissed by the high court of madras. The state government was instructed to act on the petitioner's

[20] An Exclusive Economic Zone (EEZ) is a concept adopted at the Third United Nations Conference on the Law of the Sea (1982), whereby a coastal State assumes jurisdiction over the exploration and exploitation of marine resources in its adjacent section of the continental shelf, taken to be a band extending 200 miles from the shore.

[21] 'Resource extraction' (UNDERSTANDING GLOBAL CHANGE, 2022)

[22] Resource extraction' (UNDERSTANDING GLOBAL CHANGE, 2022)

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representation in line with the law by the first bench, which was composed of that time active chief justice Huluvadi G. Ramesh and R. Mahadevan. On October 1, 2003, Tamil Nadu state issued an order that restricted the licences and rendered the current licence useless. Private contractors were using the riverbed for their own purposes despite the limits. The state must take appropriate action right away against anyone engaged in illegal mining, transportation, or storage within its borders. It must also proceed with the permanent seizure of any vehicles used in these illegal activities and the cancellation of the vehicle's registration certificate, with no recourse for the owner.[23] One can report illegal sand mining to the police or to the environment ministry. Anyone discovered engaging in unlawful sand mining may be subject to severe penalties. Even the police are now empowered to stop illegal sand mining and confiscate illegally mined or transported sand.

Criteria to permit sand mining in India

India's Mines and Mineral (Development and Regulation) Act, passed in 1957, governs mining operations there. The Indian government has taken another step toward enforcing rules after unlawful and unsustainable sand mining persisted in spite of a set of instructions to stop it. The National Green Tribunal (NGT) states that state governments issue approval (or environmental clearance) for the mining of sand and minerals in a region. The clearance is occasionally given out by the Center. According to Tongad, the majority of mining businesses hold environmental clearances but don't always follow the rules.

According to a number of rules, every mining operation needs environmental approval. Sand extraction without a valid permit is a crime according to Sections 120B read with Section 34 of the Indian Penal Code, 1860. This gives the police the authority to file a First Information Report (FIR) under the Indian Penal Code, 1860, and the Code of Criminal Procedure, 1973, to look into the incident and submit charge sheets to use Section 378 and 379 of the IPC in every case of theft of public property.

Additionally, the driver's licence and the vehicle's permit should be revoked or suspended in accordance with the Motor Vehicle Act of 1989 and any applicable regulations. The environment ministry controls sand mining and prevents illicit mining with its "Enforcement & Monitoring Guidelines for Sand Mining 2020." This occurs four years after the government's "Sustainable Sand Management Guidelines 2016," which failed to stop sand mining in the country without a permit. According to the 2020 recommendations, "...there is frequently a propensity to penalise primarily the drivers of the cars. Drivers represent merely a small portion of the illegal mining and transportation mafia's operations. Identification of all people responsible for the offence is necessary.

The mining activity has to be covered by a licence or lease, and if the lease's terms continue to violate the law after its term expires, a new lease must be obtained. It is unlawful to mine outside of the lease area under this act. After an early lease termination, the state government must be consulted for section 4(A)(1) of the MMDRA, 1957 to take effect.

When it is in the best interest of regulating the development of mines and minerals, protecting the environment, controlling floods, preventing pollution, avoiding danger to the public's health or communications, ensuring the safety of buildings, monuments, or other structures, or for any other reason the district level committee may deem appropriate, it has the authority to terminate or cancel the lease after consulting with the central government. However, this law is not all-inclusive; additional bodies, such as the NGT and the Ministry of Environment, Forest,

[23] Hanna james, 'India still mile away from sustainable sand mining, voices from Thottappally, other coasts need to be heard' (ONmanorama)

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and Climate Change, may also have the power to enforce it.

Failure of Indian authorities in preventing illegal sand mines

Sand mines is one sort of a major problem in India that it turned into a criminal industry, which has been continued to exploit lakhs of tonnes of material every year in daylight and robbing of the riverbanks, beaches, and canals. The tangible properties of both the rivers and the riverbanks are altered as a result of riverbank mining, as per the Geological Survey of India, and this has a significant impact on the biodiversity of water plants and creatures.[24] India consumes 50 lakhs tonnes of the products yearly, and that is just the officially recorded number, under the India Construction Industry Development Council, which advises the officials on construction policies.

An article on ABC Foreign Correspondents claims that the Indian sand industry employs over 35 million people and is worth well over $126 billion annually.[25] The supply issue may in part be ascribed to environmental restrictions put in place to safeguard ecosystems or to the use of illicit methods to establish a supply chain. Sand mining is such an issue in India that a black market has grown up to exploit millions of tonnes of this resource every year. Sand is being illegally taken from riverbeds, canals, and beaches in an open pillage. Housing for the average individual is getting increasingly out of reach due to the illegal sand trade, and for the personal gains of themselves the sand mafia is exploiting the ecosystem.

Small island states, where there are few choices for retreat, are particularly vulnerable to the global average sea level rise, which is projected to reach 0.25 to 0.5 metres by 2100 under the best-case scenario (of a 70% reduction in greenhouse gas emissions). Sand is being imported in enormous quantities for use in taller skyscraper construction and coastal protection in the Maldives in order to fortify Male, the nation's capital. Sand islands off the coast are where the sand is taken. Ironically, the sands removed for Male's safety measures are causing these other islands to sink, necessitating more human relocation.

Over 35 million people are employed by the Indian sand industry, which has a yearly economic value of well over $126 billion, as per a recent article on ABC's Foreign Correspondent. According to Rege's research, the illegal sand mining industry may bring in between US$16 and US$17 million every month. Politicians and their corporate associates collaborate to take advantage of the nation's expanding building industry in one of the largest frauds in history. The environmental restrictions put in place to safeguard ecosystems or the use of "illegal means" to establish a chain of supply may both play a role in the supply dilemma.[26]

Even though the Environment Ministry at union level made some significant strides to address the issue by drafting recommendations in 2015 of September on how to crack down on unlawful sand mining methods, the issue is still very much alive and well. Illegal mining in Punjab, a state in northern India, has its own repercussions. Unrestrained sand mining has caused the river banks to erode, increasing of overflowing and posing a serious threat to the ecosystem. On top of that, despite the state's efforts, illegal sand mining is not producing significant cash. The present debt of Punjab is roughly Rs. 1.12 lakh crore.[27] Captain Amarinder Singh, the recently elected chief minister of Punjab, had claimed that the sand mafia was plundering the state of Rs 5 crore every day. The newly formed government is anticipated to establish an investigative committee to apprehend those connected to its black marketing given that the names of senior

[24] 'Mines, mafia and the demand for sand' (Livemint)
[25] Christina lu, 'The Great Sand Grab' (Foreign policy)
[26] Christina lu, 'The Great Sand Grab' (Foreign policy)
[27] Divyansh upadhyay, 'Why unlawful sand mining in India needs good governance' (Down To Earth)

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members of the old SAD-BJP government's leadership have been linked to the "sand mafia." A Special Investigation Team (SIT) was mandated by the High courts of Punjab and Haryana to look into illicit mining in Punjab four years ago, according to an NDTV report. "The officers of the state of Punjab are either complicit or in connivance with people responsible for illicit mining," the court said last year.[28]

Suggestion and Remedies

The dangers of irresponsible sand mining has been in the eyes of Ministry of Natural Resources and Environment and also the dangers it poses to society and the environment. Today, borrowing of sand from most of our rivers has been temporarily halted, causing a standstill and panic on the building front. Due to the relatively delicate and dynamic nature of the coastal zone, sand mining from the former is not generally authorised. The need to investigate alternatives for granular sandy material has been justified by this circumstance. A potential source is the sandy material that is present in the coastal and near-shore environment. This issue has been partially resolved by switching out river sand for crusher sand. Additionally, contaminated sands, which are a combination of delta and seashore land sand, are often used.

According to the UNEP observation in 2019 they have figured few of already existing solutions that can be used to minimize the risks faced by residents and employees, as well as harm to ecosystems near sand mine operations. The report recommended changing how buildings and infrastructure are planned and built in order to bring down the demand for sand and gravel to reasonable levels. One strategy to achieve this is to reduce the wasteful use of sand.[29] In 2014, approximately one-third of Dubai's office space was vacant, and the Burj Khalifa was described in the study as a status symbol rather than a structure built to fulfil a functional need. With a record-breaking 330,000m3 of concrete and 103,000m2 of glass, Dubai's 828-meter tower was built.

We need to radically rethink our infrastructure and construction projects to reduce sand usage, and the UNEP says this sustainability focus must be built into all future projects.Sand can be replaced by Sand Made from Crushing Quarried Rock. Due to the numerous hard rock exposures that make up the western Ghats, crushing rock yields sand, or "crusher dust," which offers Kerala a potential substitute for river sand. There are numerous crushing facilities operating in various regions that provide enough crusher sand to the construction sites. However, the obsession with river sands is still alive and well.[30] Although crusher sands seem like a good alternative, producing this aggregate requires a lot of energy and harms the surrounding area's environment through noise and pollution.

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[28] 'Sand mining: the global environmental crisis' (The Guardian)
[29] Sand mining: the global environmental crisis' (The Guardian)
[30] Divyansh upadhyay, 'Why unlawful sand mining in India needs good governance' (Down To Earth)

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The government should take prudence when leasing the riverbed for mining operations, properly define regions, and regulate mining through suitable institutional frameworks. Since the amount fluctuates from river to river and from stretch to stretch within a river, a regular evaluation of how much sand can be mined ethically is needed. Intrusive Methods: Using intrusive methods, such as explosives and large excavators, when mining for sand is typically dangerous. Sand mining should be done manually and sustainably, especially in mountainous areas. High-level Lobbying Group: A high-level lobbying group needs to be established, laws need to be applied effectively and fairly, and prompt environmental solutions need to be put into action.

Glass that has been recycled into sand possesses properties that are comparable to those of natural sand without sacrificing strength. Studies have demonstrated that recycled glass can be utilised for beach replenishment, lowering both coastal damage from sand extraction and the amount of glass that ends up in landfills. Using larger particles of crushed glass to build concrete can cut CO2 emissions by up to 18%.[31]

According to research from the University of Bath and India's Goa Engineering College, while evaluating plastic as a potential substitute for sand in concrete, sand-sized PET particles from recycled plastic bottles produced the greatest results. A 54MPa compressive strength was attained by the plastic substitute, which is on par with concrete's strength. According to the study, 820 million tonnes of sand could be saved annually by substituting plastic for just 10% of the sand used in concrete.[32]

Conclusion

Buildings, infrastructure, and the extraction of minerals are all benefited by sand mining, which also has positive social and economic effects. Even so, irresponsible, intensive sand mining undermines these achievements and causes a host of environmental issues. The sand mining regulatory agenda is passive, which makes enforcement challenging and complex. The regulatory bodies' incapacity and the absence of defined norms for handling sand mining operations lead to dishonest sand mining practises and harm to environment. Even though the appropriate authorities has taken action to close illicit sand mining and provide an substitute for selling sand for production, mining is still taking place.[33] Although for structural development, sand is a requirement, and on the other side we cannot ignore the threats posed due to sand mines. Therefore, there is a need for some decisive steps that are need to be taken and also we need to come up with alternate solutions for sand mining, without damaging the environment.

When we talk about a country's available natural resources that also involves its mineral richness. By planning and using them properly for developing and utilising the natural resources, the country will raise and increase in industrial and economical resources. The natural resources which are extracted from the earth, once they are extracted, they cannot be put back and this must be kept in minds of every human that it also applicable to sand which s also a natural resource. “Once removed, sand cannot be replenished in the following generation”. Its not like the natural resources will get extinct, the regeneration process of any resource will take a longer time which can go to decades and centuries. Sand is one such resource which is require by humans in both development and for their safety. Safety because sand control the flow of rivers and tries to keeps the water from going to larger distances to sustain the growth of trees, boost the growth of crops, and produces drinking water. It in a way tries to sustains human

[31] ‘Sand Mining’ (ENVIS Centre on Environmental Problems of Mining)
[32] Mines, mafia and the demand for sand’ (Livemint)
[33] ‘Sand mining: the global environmental crisis’ (The Guardian)

existence. People for the purpose of their own commercial and personal gain they try to exploit natural resources like sand for their own gains by extracting out the sand unequally and in a unbalanced manner from the water bodies like rivers, dunes, and beaches and this will destroy the entire ecosystem. because due to mining sand, the purpose of sand's existence will gets ignored. Also, the ways of human for extraction like the usage of huge machines and other pumping machines are used for extraction, these will lead to an result of number of natural disasters and that will affect the economy and led to economical losses for the country. Governments should control mining in order to maintain the balance between the environment and sand mining.

Although there are now no formal regulations in place, it is advised that local governments create legislation to assist protect the ecological beauty of their regions. Communities near extraction sites should receive environmental awareness training, and there must be a regular checking on the bodies so that there is no concern of unauthorised sand mines. This will assist in keeping track of and enforcing the ordinances created to advance society. The Studies centres on the effects of sand mines on water quality, the affects on land by it, and the workforce should also keep track of the harm caused. This would make it easier for the populace and the government officials to recognise and comprehend the type and extent of the effects of sand mining on local water quality., In order to preserve our ecosystem, the government should enact rigorous regulations and put an end to sand mining that is not authorised.

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