

A Review on the Negative Impacts of Black Sand Mining on the Ecosystem of Kerala

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ABSTRACT

India having coastline of in excess of 6000 km, has likely the greatest and most luxurious coastline placers. India's beach sand stores and rises contain weighty minerals like ilmenite, zircon, rutile, monazite, and sillimanite, the world necessity of garnet. Kerala has a 570 km long coastline as one of world's most potential fishing ground with exceptional biodiversity and furthermore as the plentiful wellspring of probably the most extraordinary minerals that can be found in the world. The most expected wellspring of these mineral stores is the coastline of the stretch of Kollam and Alappuzha that extends around 150 km. The dark sand mining has influenced the biodiversity of the zone consequently absolutely influencing the lives of the rural communities bringing about an ecological constrained movement and occupation misfortune. This paper critically reviews the negative impacts of the black sand mining on the ecosystem of Kerala.

Keywords: Black sand mining, minerals, ecosystem, socio economic impacts

1 INTRODUCTION

Ever growing population and economic development bring about expanded per capita utilization of normal assets, both living and non-living. Industrialisation, agricultural activities and intense pace of quickened the speed of natural corruption. Rivers are widely exploited for sand and gravel, besides water, also coastlines are deteriorated for mineral extractions from the black sand. Minerals are non-inexhaustible assets, perhaps in the human life scale. Environmental issues emerging from black sand mining is normally extreme in Kerala State, as the coastlines are overexploited for the minerals. Black sand mining has resulted in shoreline changes and in the loss of biodiversity, in the vanishing of many villages and has caused environmental forced migration and has a major impact on the rural communities in a socio economic aspect. There arises a need to study the impacts of black sand mining on the ecosystem of Kerala.

2 BLACK SAND

The most recently originated minerals deposits are the black sand minerals. These are originated in southern hemisphere due to continental drifts. Because of movement between various plates and continued weathering for example warming and cooling, breaks are made in the stones and water gets gone into these breaks. When the parent rock is exposed to weathering and disintegration and is transferred along with sea water, finally sediment in a suitable basin. Concentration goes on increasing with time and continued erosion due to air and water takes place.

In this way, hefty minerals impervious to enduring and scraped spot move in these regions, however they might be just minor constituents of inland shales. Placer mining of such deposits yields magnetite, cassiterite, and zircon and gold, platinum, and other rare metals. Because of their unique attractive, glowing, and electrochemical properties, these components help cause numerous advancements to perform with decreased



weight, diminished discharges, and energy utilization; or give them more noteworthy effectiveness, execution, scaling down, speed, toughness, and warm steadiness. Alongside these one other significant constituent of sea shore sand mineral is Monazite. Monazite is the primary ore for thorium, a nuclear fuel. Its presence brings beach sand mining under the Atomic Minerals Concession Rules. The 17 rare-earth elements are; Scandium, Yttrium, Lanthanum, Cerium, Praseodymium, Neodymium, Promethium, Samarium, Europium, Gadolinium, Terbium, Dysprosium, Holmium, Erbium, Thulium, Ytterbium, Lutetium.

3 BLACK SAND MINING

Black sand mining upsets marine and waterfront biological systems and builds disintegration and related geohazards. Coastal black sand rises fill in as living space for little creatures and plants whose misfortune suggests a danger to their predators. The sand dunes are additionally regular obstructions to salt water, without them the ocean frequently floods inland at elevated tides. The mining practices increase shoreline crumbling by wiping out sand just as by disturbing the residue sediment budget, often depriving areas in the down- current direction of their sand input.

Accordingly, ocean side breaking down habitually continues impacting the zones even quite a while after discontinuance of the mining works out. This evacuation of material and related disintegration additionally likely outcomes in land subsidence, which makes neighborhood networks especially helpless against floods, harm from occasional storms, and ocean level ascent. Moreover, dark sand tasks are regularly connected with groundwater extraction, which brings about bringing down of the water levels and builds the land subsidence.

4 HISTORY OF BLACK SAND MINING IN KERALA

Generous mineral stores of Manavalakuruchi in the domain of Travancore (by and by Tamilnadu) was found by Schomberg , a German logical master in 1909 which was shown more luxurious and moderate stood out from rest of the World War I permitted the British an opportunity to sieze the German - upheld association and Schomberg was caught and delivered off Madras. The interest of monazite shippers was halted after 1920. First shipment of ilmenite from India was affected in 1922 and production reached out in 1940 contributing right around 80 % of the world production which is practically 300,000 tons.

5 BLACK SAND MINING AREAS IN KERALA

Kerala is known for its 570 km long coastline as one of world's most potential fishing ground with amazing biodiversity and besides as the plentiful wellspring of unquestionably the most extraordinary minerals in the globe, especially its southern coast. It is one of the ten 'Heavens Found' by the National Geographic Traveler, for its distinctive geology and overwhelming greenery, where, fall a segment of the sandy coastlines and backwaters. Sand dunes of the southern Kerala coast are advanced with six "endorsed substances" viz. ilmenite, rutile, zircon, monazite, leucoxene (earthy colored ilmenite), sillimanite and garnet.

The most likely wellspring of these mineral stores is the coastline of the regions of Kollam and Alappuzha that extends around 150 km. Mining in the Kollam coast started in 1922 and still proceeds, undisrupted. As the minerals mined contain conceivable atomic fuel, Central Government laid extreme mining rules and guidelines (Atomic Energy Act, 1962), which denied individuals or private endeavors from undertaking such mining development. These principles and guideline were relaxed lately.

6 NEGATIVE IMPACTS OF BLACK SAND MINING ON THE ECOSYSTEM OF KERALA

The negative impacts of black sand mining on the ecosystem of Kerala (shown in the Figure:1)

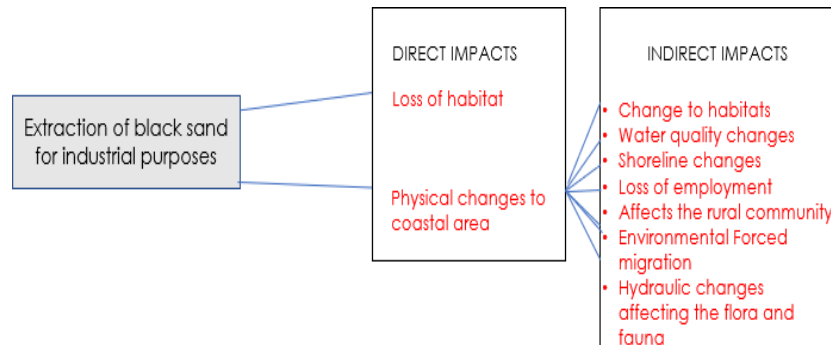


Figure 1: Direct and indirect impacts of black sand mining on ecosystem of Kerala

(Source: Author generated)

6.1 Loss of habitat:

Habitat loss occurs due to the extreme black sand mining. Many species like the turtles are on the verge of extinction due to this. The estuary areas are the breeding grounds for fishes. These areas get disturbed due to the uncontrolled black sand mining.

6.2 Physical changes to coastal area

Sand erosion occurs due to the extreme black sand mining and it results in shoreline changes. The area gets affected with high tides and the buildings near the coast get destroyed.

6.3 Water quality changes and hydraulic changes

The dredging activities result in the water quality deterioration. The presence of the chemicals is found to be there in the groundwater of the black sand mined areas.

6.4 Loss of employment

As the black sand mining activities affect the environment, the people employed in the primary sector like fishermen, farmers etc get affected and they have to face a huge loss. They are forced to find new jobs for their livelihood.

6.5 Effects on rural community and environmental forced migration

As the ecosystem gets affected, the community is being forced to leave that place and shift to another place, which affects them socially, culturally and economically.

7 CASE STUDY: CHAVARA, KOLLAM

The mining and treatment of phenomenal earth minerals along the coastline of Chavara, Kollam, Kerala (shown in Figure 2) has been a tremendous development in certainty for the country with respect to being a purposely huge industry but the grave ecological outcomes taking into account the rash administration of the advanced waste from the titanium dioxide (TiO₂) pigment delivering industry is an explanation behind concern. This has

prompted the geo-ecological debasement of encompassing region which is likewise a high background radiation region. (Humsa, Volume 11,2015)



Figure 2: Map showing the location of Chavara (Source: www.google.com)

Mining and treatment of considerable and remarkable earth minerals certainly incorporates distress of the land environment, which depends upon the type of artificial materials and cycles used. The occurrence of substantial mineral rich placer stores along Chavara-Neendakara coastline of Kollam,Kerala are being mined since 1922. The introduction of titanium dioxide (TiO₂) pigment producing plant in 1984 made the business deliberately significant. However, the mining exercises alongside preparing of substantial minerals and production of TiO₂ pigment resulted in the release of various impurities explicit to the business. These foreign substances joined with the inadvertent spillage of tickle, crude material for TiO₂ from Kerala Minerals and Metals Ltd. (KMML) has prompted the geo-environmental corruption of encompassing region of industry inside a span of 16 km square. The environmental impacts,health impacts and socio economic impacts due to the black sandmining in Chavara are shown in the Table:1.

Table 1: Negative impacts of black sandmining in Chavara(Source: *Author generated*)

<p>Environmental impacts</p>	<p><u>Land pollution;</u> Land contamination due to destruction of vegetation <u>Water pollution;</u> People are warned not to use the water for drinking ,bathing or even for toilets Disappearance of mud banks. <u>Air pollution;</u> Frequent gas leaks The soil and water are heavily polluted with iron and chlorine. Shoreline changes</p>
<p>Health impacts</p>	<p>Incidence of cancer ,asthma,skin ailments etc(shown in Figure :3)</p>
<p>Socio economic impacts</p>	<p>Destruction of farmland thereby violating the rights of local communities. Decline in coir industry</p>



Figure 3: Skin problems to residents (Source: www.sciencedirect.com)

8 CONCLUSIONS AND SUGGESTIONS

Mining activities should proceed, however all endeavors ought to be made to restrict harm to the climate and society. For this a proper sustainable method must be followed. Taking into account indispensable job that mining area plays in occupation creation and neediness alleviation, it is significant that due acknowledgment is given to this area by central government and local authorities. There should be a move towards a culture of wealth generation and to bring the mining area into the authentic social texture of the country. The aim should be to inspire the miners to be entrepreneurs, not to force and frustrate them. The approach to sustainable mining will encourage the miners to act inside the legitimate structure, with due respect to health, safety and the climate.

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