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RESEARCH ARTICLE

STATUS OF SAND MINING IN ANDHRA PRADESH, INDIA

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ABSTRACT

Sand mining' is a practice that is used to extract sand, from various environments like beaches, inland dunes, ocean bottoms and river beds. There is a lot of demand for quality sand in newly formed Andhra Pradesh, where world class new capital city is under construction. Excessive extraction of sand using heavy machinery and huge trucks has become a big ecological and safety threat in many parts of the state. Illegal sand mining is rampant in all the districts of Andhra Pradesh. Modifications are incorporated for new policy and decided to implement from February, 2016. There are several problems observed at the field level. Keeping the problems in view, it is suggested that before sand mining, specific hydrologic and hydraulic information are necessary. First and second order channels should be deepened and gully flugs be constructed, which enhance the ground water recharge. There is no coordination between various departments involved in sand mining. So, single window system should be introduced. Only one office shall finally look control of sand mining by acquiring the required staff and infrastructure. It is the responsibility of every citizen to support the measures taken by the Government to curb illegal sand mining to save our environment and our lives.

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INTRODUCTION

Sand has become a very important mineral for the expansion of society. Building activities have grown rapidly in developing countries, and subsequently the demand for construction-grade sand has increased tremendously. There is a lot of demand for quality sand in newly formed Andhra Pradesh, where world class new capital city is under construction. In addition to the construction purpose the sand has been utilizing for glass making, concrete, oil exploration, filling roads, reclamations, building sites, and for renourishing beaches. Each purpose has its own requirements in respect of the quality of the sand. On an average, people 'use' over 200kg of sand per person per year. [1]

'Sand mining' is a practice that is used to extract sand, from various environments. The sand is mining from beaches, inland dunes, dredging from ocean bottoms and river beds. The mining has been carrying in all most all the districts of Andhra Pradesh. Environmental problems occur when the rate of extraction of sand, gravel and other materials exceeds the rate at which natural processes generate these materials. The morphologies of the mining areas have demonstrated the impact of mining with the prowess to destroy the cycle of ecosystems.

Excessive amounts of sand are often experienced as a nuisance to society, such as on fertile lands, encroaching rear dunes, sand in navigation channels and boat harbors, sand passing entrances to ports and so on. Such places can be mined economically to solve sand problems.

Effects of Sand Mining

Sand mining damages environments like River, Coastal and lakes. It has a lot of negative impact on Biological, Ground water resources and Sociological aspects. While small-scale extraction of sand by villagers for local use had never posed any problem, excessive extraction of sand using heavy machinery and huge trucks has become a big ecological and safety threat in many parts of the World.

Some of the effects are

- Overall impact of mining on the soil profile that has developed into its present shape over millions of years.
- Microclimates disturbed.
- Contamination and salinisation of ground water, altering drainage patterns, changing the water balance and drawing down the water table.
- Large areas of vegetation will be affected
- Affect number of rare species of birds, fishes, crabs,

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- frogs, snakes etc. are unexplored.
- Increased beach erosion and coastal erosion, resulting in land loss.
- Change river morphology.
- Socio economic impact on the rice cultivation, inland fishing and aquaculture depended population.
- Socio economic impact on coir and coir products.
- Land contamination as a result of spillages or improper disposal of mineral residues, sewerage and chemicals.
- Radioactive residue dumped back into the mined pits resulting in increased natural radiation in the area. Health hazards as result of this process.
- Tourism depended population.
- Dust generated by mining is cancerous, also spoils the home environment.
- Noise pollution caused by the mining machinery, trucks and cranes.
- Damage roads and infrastructure.

has to contain silica 3. The sand needs to be at a certain humidity. The most common frequency emitted seems to be close to 450 Hz.^[3]

Sand Hazards

Based on the sand composition/mineral present sand mining/using activities such as silica sand mining, radioactive mineral sand mining and sandblasting require precautions. Bags of silica sand used for sandblasting now carry labels warning the user to wear respiratory protection to avoid breathing the resulting fine silica dust.

In areas of high pore water pressure sand and salt water can form quicksand, which is a colloid hydrogel that behaves like a liquid. Quicksand produces a considerable barrier to escape for creatures caught within, who often die from exposure.

Hydrofracking is a process in which highly pressurized chemicals and water are pumped into existing oil and natural gas wells, thousands of feet deep into shale, and then turned horizontally, sometimes as wide as a mile, fracturing existing cracks in the shale and allowing oil and natural gas to flow at a higher rate into the wells.

To keep the fractured shale from closing up, water and frac sand are packed into the cracks. Weaker proppants (particles which hold fractures open) could crumble amid the pressure, and less porous ones would not allow a maximum flow of oil or gas. While synthetic proppants do exist, they are primarily manufactured in China, and extremely expensive.

Sand Mining in Andhra Pradesh

Andhra Pradesh is one of the 29 states of India, situated on the country's southeastern coast. The rivers flowing through the state are the Godavari, Krishna, Penna, Mahanadi, Tungabhadra, Vamsadhara, Nagasaki, Bahuda and Mahendratanya. In all the river basins sand reaches are allotted.

Indiscriminate sand mining

Illegal sand mining is rampant in all the districts of Andhra Pradesh (Table -2). Illegal sand mining is noticed all along the river Krishna in Guntur district (Photo 1).^[4]

Following a public interest petition against indiscriminate sand mining in the Krishna River, the Andhra Pradesh High Court had stayed sand mining and auction of sand reaches.

Some people had moved the high court, alleging that there was a strong contractor-politician-bureaucrat nexus in sand mining, and that mine lease holders were violating rules and regulations. Some environmentalists too had gone to the court, contending that over-exploitation of river sand was creating environmental imbalance.

Sand Types

Sand becomes the part of the human civilization and influencing the environment and its components. To understand the problems and perspectives of the sand mining, one should know about the types, uses and origin of the sand.

Wentworth^[2] (1922) divided the sand into five size grades, namely, Very coarse sand, Coarse sand, Medium sand, Fine sand, Very fine sand (Table.1).

Table – 1 Wentworth sand grades (1922)^[2]

Millimetres	Wentworth Grade
>1	Very coarse sand
>1/2	Coarse sand
>1/4	Medium sand
>1/8	Fine sand
>1/16	Very fine sand

By Nature sand occurred in various environments. The details are as follows.

River sand	Sand from river beds
Beach sand	Sand occurred on beaches
Immature sand	Sand composed of the same Minerals that made up its parent rocks.
Ooid sand	Ooids are rounded pellets formed in shallow wave agitated water.
Desert sand	Occurred in Deserts
Dune sand	Deposited as dunes
Biogenic sand	Sand composed entirely of tiny skeletons of life
Mature sand	Mostly sand size grains with a negligible percent of other
Singing sand	Singing sand, whistling sand or barking sand is sand that produces sound. The sound emission may be caused by wind passing over dunes or by walking on the sand. 1. The sand grains have to be round and between 0.1 and 0.5 mm in diameter. 2. The sand

Table – 2 Illegal sand mining in various districts of Andhra Pradesh ^[5]

S.No.	Districts	Villages
1	Srikakulam	Mabugam(Polanki Mandal), Muddapet(Echherla Mandal) , Gopalapenta (Narasanna pet Mandal), Chenuvalasa, Singuru(Ponduru Mandal)
2	Vijayanagaram	Burkhaloni Revu (Sitnagaram Mandal) Kolimeru revu (Tuni Mandal), Penugollu (S.Rayavaram Mandal)
3	Visakhapatnam	Kasimkota, Tegada, Somavaram, Perantalapalem.
4	East Godavari	Ainavilli, Mamidikuduru, Malikipuram, Sakhinetipalli, Ipolavaram, Rajolu, Allavaram, Katrenikona Mandals.
5	West Godavari	Siddantam, Kagorumilli, Vadapalli, Gonguratippalakam, Nagireddigudem, Yenuguvanilanka, Aurangabad.
6	Krishna	Along the Krishna River
7	Guntur	Vundavalli reach (Tadepalli mandal), Vaikunthapuram (Amaravathi mandal), another reach in Amaravathi village, Didugu, Munugodu, Kastala (Atcham pet mandal), Krosur, Taduvai, K.V. Palem (Tenali mandal), Chamarru, Challagarika and Regulagadda (Machavaram mandal), Rayapudi revu, Penumaka, Penumudi, Kogantivaripalem,
8	Prakasam	Mallavaram, Vikkiralapeta, Bhimavaram, Dondapadu, Maddiralapadu (Kothapatnam Mandal), Manneru, Paleru (Kandukur Division)
9	Nellore	Loading 14 cu.m loading instead of 9 cu.m
10	Kadapa	Tanguturu (Nandaluru Mandal), Seshamambapuram(Razampet Mandal), Komatharajupuram (Penagaluru Mandal), Gandikota Reservoir.
11	Kurnool	Emmiganuru, Mantralayam
12	Ananthapuram	Chinnachigulla revu(Tadimarri Mandal), Devunuppalapadu(Pedda Pappur Mandal), Chinnayakluru, Ganguapuram(Kanikel Mandal), Banduru Bommanhal Mandal, Hindupuram., Rayadurgam, Tadipatri.
13	Chittoor	Kuppam, V-kota, Santhipuram, Ramakuppam, Gangavaram, Palamaneru., PTM, Tottambedu, Pitchturu Mandals



Photo - 1 Indiscriminate sand mining in the Krishna River

They argued that the sand mining should not cause water and sound pollution and that the government should not allow quarrying in the absence of Environmental Impact Assessment.

Srikurmam Deposit

Trimex Group has set up Mining and Mineral separation facilities based on the existing Srikurmam deposit in Srikakulam, to produce heavy minerals i.e. ilmenite, rutile, zircon, garnet and sillimanite.

The Akhila Bharata Rythu Coolie Sangham and other organisations are vehemently opposing the sand mining activity in Vajrapukotturu mandal in the district, as they believe that it is detrimental to the interests of fishermen and other communities that depend on the sea for their livelihood. Agitations have become the order of the day in several villages, including Kottapeta, against beach sand mining. It is alleged that such an activity is against the Coastal Regulation Zone Act. The protesters are making it clear that they will not allow the Trimex Sands Private Limited to take up sand mining activity in their vicinity even if the government allows the company to establish its plant in the mandal.

According to Timex group, beach sand mining is completely eco-friendly. After processing the sand, it will again be dumped in the same place. The company has already committed itself to spending Rs.50 crore on welfare activities in the district as part of its CSR.

Past status of sand mining

The sand mafia, which is highly influential, is reportedly extracting between Rs.80 crore and Rs.100 crore worth of sand every year from the Vamsadhara, Nagavali, Bahuda and Mahendratnaya rivers. At any given time, one can see movement of fully loaded lorries and tractors - up to 300 from Srikakulam to Visakhapatnam district. The Government gets only Rs.5 crore as seigniorage from the five ramps located at Yaragam, Kadumu, Sirusuwada, and Billamadaand Akula. It gets nothing from the illegal sand ramps in Bhairi, Karajada, Gopinagar and Madapam.

Court ban

The High Court made clear that it cannot allow the devastation of the state for the sake of benefiting a few individuals and imposed a ban on sand mining in AP. A Division Bench pointed out that the authorities are not at all interested in protecting either the river beds or the environment or even willing to assess the impact of digging and quarrying of sand along the river beds.

The Bench made it clear that it was well aware of the fact that the stay will lead to the state losing revenue, but said that it cannot remain a mute spectator when contactors are digging the riverbeds beyond the prescribed limits and causing irreparable damage to the environment, even as the authorities are not bothered to control the rampant illegal mining. Expressing serious concern over the adverse affect on the environment, the CJ said that you are allowing the illegal mining to generate revenue today and one day the state will sell the air and the people will have to buy it to breathe.

Apex Court refuses to lift stay on sand mining

On 7th May, 2012, the Supreme Court has refused to vacate the stay granted by the AP High Court on sand mining in the state. While dealing with a batch of Special Leave Petitions moved by the state government and others, the apex court directed the state government to approach the Ministry of Environment and Forests (MoEF) to get clearance for the sand mining in

accordance with the EIA (Environmental Impact Assessment) notification.

- The MoEF has been asked to dispose of the applications filed by the state government to get clearance for sand mining in various rivers across the state within three weeks. Among the others who moved the petitions was M/S Nagarjuna all Castes Coop Society Ltd, the SEW Infrastructure Ltd, the Builders Welfare Association, and the Builders Association of India.
- Refuting the contentions of the petitioners that several ongoing infrastructure and irrigation projects had been adversely affected by the ban on sand mining affected by the AP high court, the apex court expressed serious concern over the activities of the mining mafia.
- The court made it clear that the directions of the apex court in Deepak Kumar v. State of Haryana and others will be applicable all over the country, not only for AP or Haryana. On February 27, 2012, it had ruled that leases of minor mineral including their renewal for an area of less than five hectares be granted by the States /Union Territories only after getting environmental clearance from the MoEF.

Committees to curb illegal sand mining

The Andhra Pradesh Government has set up a Group of Ministers (GoM) to review the sand mining policy, with the Principal Secretary to the Government (Mines), Industries and Commerce Department, as its Convener. Ministers of Mines and Geology; Major and Medium Irrigation; Finance and Planning; Forests and Environment; Minor Irrigation and Panchayat Raj; and Rural Water Supply will be the members in the GoM.

Worried over losing precious revenue the state government has issued orders to the district collectors to constitute committees, at various levels, for curbing illegal sand mining in the state. Earlier, the mining department had submitted a report in which it suggested the setting up of such committees. It attributed the lack of adequate staff in the mining department to the failure in curbing the illegal sand lifting. The existing staff is less than half than that of the total sanctioned strength of 2,000. The department has sought immediate appointment to the vacant posts. The shortage is so acute that there is only one vigilance officer for each district.

Illegal sand mining has come down in the districts where the committees have been constituted. The committees in Srikakulam district have collected Rs 25 lakhs in a few days by fining the vehicles which were transporting sand illegally. Cases were also booked against the vehicles owners. So, one can understand the extent of illegal sand mining. Meanwhile, the state government had constituted a Group of Ministers (GoM) committee to decide a new sand policy.

Sand Mining- Old Policy

Andhra Pradesh Government introduced a new Sand Mining Policy on 13.12.2012^[6] under which the old system of auctioning has been dispensed with and a lottery arrangement

put in place. Based on the recommendations made by a Group of Ministers, which reviewed the sand mining policy in the light of the Supreme Court's verdict banning indiscriminate quarrying, the Industries Department issued an order, framing the revised policy guidelines.

As per the Government Order, the existing norms of the Andhra Pradesh Minor Mineral Concession Rules, 1966, were being rescinded to regulate sand quarrying activity. Important points are given below

- Allotment of feasible sand-bearing areas should henceforth be through a selection process by way of draw of lots.
- Extraction of sand should be by manual means only and use of machinery should not be permitted except in specific sand-bearing areas where there is no impact on groundwater table.
- For the first time, the Government issued guidelines for sand mining in private lands along the river beds. Only farmers who own the sand-casted land will be permitted to quarry and sell it after paying seigniorage fee to Government.
- As per the new policy, sand acquired through desilting of reservoirs by the irrigation department will be utilised for Government works.
- Farmers can remove sand accumulated on their own land after paying seigniorage fees to the government.
- Sand from rivulets, streams and tanks falling under the administrative jurisdiction of block panchayats could be used free of cost for local needs and the Andhra Pradesh Government's Indiramma housing project for the poor without paying the seigniorage fee.
- The Andhra Pradesh government has decided to promote rock sand manufacturing units in the state, as scarcity of natural river sand is severely affecting the construction sector.
- For the Tribal areas separate guidelines were issued.

For sand mining in tribal areas

1. The Andhra Pradesh Government has announced new guidelines for sand mining in Agency (tribal) areas of Khammam and Warangal to bring transparency and accountability.
2. According to the guidelines issued by the Government, the Andhra Pradesh Mineral Development Corporation Ltd has initiated steps to start sand operations under the control of gram panchayats and tribal societies. This will be under the supervision of district collectors and Integrated Tribal Development Authority.
3. The Corporation should allot sand reaches to the gram panchayat and the sand thus extracted will be stored at a stock point after transport. Work may be allotted to the local society according to the rate fixed by the gramsabha.
4. The necessary finances will be provided to the society through local banks with the coordination of the Corporation and the Authority.
5. According to the guidelines, about a quarter should be allocated to the Government works, another quarter for

local use and the remaining half could be traded for commercial use in the open market through bidding.

6. All the transactions will be through bank accounts and no cash transactions will be entertained.
7. Of the profits, half will be deposited in gram panchayat funds for community development and welfare of local people and the other half for societies.

Sand Mining – Current Status

During August 2014, the Government had taken a policy decision to organise the sand mining under the control of DWACRA groups. However, the policy has not delivered the goods, rates are hiked, people suffered, illegal mining became common throughout the state. District wise sand reaches and income are shown in Table.3.

Table - 3 District wise sand reaches and Income ^{[7][8]}

S. No	Districts	Sand Reaches	Sand Income Rs. Cores
1	Srikakulam	27	62.07
2	Vizianagram	47	20.86
3	Visakhapatnam	25	21.82
4	East Godavari	31	143.37
5	West Godavari	25	118.47
6	Krishna	15	140.02
7	Guntur	10	134.37
8	Prakasam	15	12.79
9	Nellore	47	70.49
10	Chittore	63	18.63
11	Cuddapah	17	41.79
12	Anathapur	29	15.90
13	Kurnool	11	20.72

Later during January, 2016, modifications are incorporated for new policy and decided to implement from February, 2016. The major change in the policy is to conduct auction for sand reaches.^[9] Salient features of given below.

- Sand reaches should be auctioned and will be allotted to those paid maximum premium from the profit.
- Sand in patta lands can be sold by farmer himself by paying premium equal to maximum premium paid by the owner of sand reaches in this District.
- There is no auction for sand acquired in Gullies and streams.
- Sand can be freely brought using bullock carts for the purpose of local house construction, Toilets, cement roads and Government works using.
- Rivers and tributaries are put in separate categories.
- Government encourage the production of Robo Sand (Rock sand) and give subsidy in electricity. Vat and sine rage. Selling price will be fixed by the Government only.
- District level sand mining communities will be constituted for observations with district joint collector (chairman) and additional director of mines (convener).
- Price for cubic meter is Rs.500; means are Ton cost Rs.1416/-

Expenditure for the excavation of one cubic meter of sand is given in Table.4.

Table – 4 Expenditure for the excavation of one cubic meter sand^[10]

S. No	Item	Expenditure (Rs)
1	Loading charges	50 (using Machines)
2	Sine rage fee	40
3	Ramp preparation	05
4	CC. Cameras T.V and Computer	15
5	Maintenance of ramp fencing	05
6	Salaries are DWACRA Women	15
7	Transportation sand reach to stock point	23
8	Miscellaneous	25
	Total	178

- Further, 2.0 lakhs penalty for utilisation of heavy machinery or put the machine for open auction.
- The Government should not permit sand mining in rivers, ground water effected areas.
- Heavy machinery should be used in streams and rivulets. The material should be used with in the Mandal.
- Mining should not be carried out from dams, bridges and drainages below 500m distance. Sign boards must be arranged.
- Vehicles should not travel on the ban of flood water channel.
- Mining should not allow below 15m from the water flow.
- Mining will be permitted upto 1m thickness in case of 3 to 8 m sand deposit and 2m, beyond 8m sand deposit.
- Rupees on lakh penalty or 100 per cu.m of sand will be collected for illegal mining.
- Should not export to other states. If wants they should pay Rs.400/- per cubic meter.
- Sand mining without permit finalized Rs.25000/- per a tractor for first time and is 50,000 per second time.
- Rs.75000/- and Rs.1 lakh 10 tons lorry, 1.5 lakh and 2.0 lakhs beyond 10 tons.
- Base on the situation Rs.2000 May be collected per cu.m. vehicles will be ceased for third time.

Problems

There are several problems observed at the field level^[11]

- Lease holders mixing river and beach sands and selling at quality sand rate
- Excavating sand also from unleased area
- Loading sand beyond lorry capacity and paying less sewerage
- Using heavy machinery
- Mining during beyond the schedules
- Threatening local people and officials
- Some politicians supporting sand mafia.
- Very little concern about the environment
- There is a big gap between availability and requirement of sand
- The state requires 2.5 crore cu.m of sand where 1.02 crore cu.m available.

Suggestions

Here some suggestions are given for curbing illegal sand mining and protecting the environment^[12]

- The mining was carried out without understanding the sand budget of a particular river reach a lunar surface. Before sand mining, specific hydrologic and hydraulic information are necessary as this will be used to determine the amount of sand that can be removed from the area without causing undue erosion or degradation at the site and also along the banks of a river.
- First and second order channels should be deepened and gully flugs be constructed, which enhance the ground water recharge.
- Maintenance of roads should be done periodically. Care should be taken to avoid air and noise pollution.
- Frequent Health campus must be arranged in surrounding villages.
- Grievance cells should be established.
- Persons/organizations involved in illegal sand mining should be put in black list.
- Awareness programs should be organized for the persons involved. The programs should explain about the origin of sand and related environmental problems.
- Periodical checking on environmental damage is necessary.
- There is no coordination between various departments. But for sand mining responsibilities assigned to Departments like mines, Irrigation, Groundwater, panchayats, District administration and police. So, single window system should be introduced. Only one office shall finally look control by acquiring the required staff and infrastructure.

- Periodically, CC camera data should be analysed. If there is no data punishments should be given.

CONCLUSION

Sand mining became major threat to the society. The involvement of politicians people and some corrupted officials complicating the problem. Hence, it becomes difficult for finding a solution. So, it is the responsibility of every citizen to support the measures taken by the Government to curb illegal sand mining to save our environment and ultimately our lives.

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