BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 557/2024

IN THE MATTER OF:-

NEWS ITEM TITLED "PRAYAGRAJ यमुना में जलस्तर घटने के साथ बना पेयजल संकट, नैनी की तरफ अननयंनित खनन पर भी ननयंिण की तैयारी" APPEARING IN AMAR UJALA DATED 13.04.2024

INDEX

6	**ANNEXURE-V** **COPY OF ORDER DATED 05-04-2019, 08-01-2020 and 26-02-2021 PASSED IN OA NO.360/2015 AND OTHER CONNECTED MATTERS,**	
7	**ANNEXURE-VI** **COPY OF DIRECTIONS DATED 11-06-2021 U/S 5 OF EP ACT FOR DEVELOPMENT OF MECHANISM FOR ASSESSMENT OF AND RECOVERY OF COMPENSATION**	

Filed By:-

DATED:

NEW DELHI

RAJ KUMAR
(COUNSEL FOR THE CPCB)
E. NO.-D/1024/2001
CH. NO.444, SAKET COURT, N.D-17
Mob:-9810007606
Mail: advrajkumar@gmail.com

ADDITIONAL REPLY OF RESPONENT NO. (i) CENTRAL POLLUTION CONTROL BOARD BEFORE THE HON'BLE NATIONAL GREEN TRIBUNA (PB), DELHI IN COMPLIANCE OF ORDER DATED 06.09.2024 IN O.A. NO. 557 OF 2024

1. That, the O.A. No. 557 of 2024 was registered suo-motu based on news item dated 21.05.2024, published in the Amar Ujala, titled "Prayagraj यमुना में जलस्तर घटने के साथ बना पेयजल संकट, नैनी की तरफ अनियंत्रित खनन पर भी नियंत्रण की तैयारी", related to the decreases in water level due to heat and uncontrolled sand mining on the bank of Yamuna in Prayagraj (Uttar Pradesh) and impleaded respondents, including Central Pollution Control Board (here in after referred as CPCB).

2. That, in compliance of above said order, CPCB filed a reply on 04.09.2024. The matter was heard on 06.09.2024 and following direction was passed:

In terms of the direction of the Tribunal, the UPPCB has filed the report on 31.08.2024. There are four raw water intake wells at Karelabagh on the bank of River Yamuna setup by Prayagraj Nagar Nigam to cater for the requirement of providing clean water supply to Karelabagh, Shahganj, Jonsenganj and other places. The report indicates depleting/decreasing water level in the river resulting in disfunctioning of pumps. It clearly mentions that out of the three pumps, pumping the water to the Khusrobagh treatment plant, the operation of the pump was stopped on 19.06.2024 since the intake of wells no. 1 and 2 had gone below the inlet suction point. It also mentions that during the summer, the water level of the river Yamuna had gone down. Comparison with 2023 has been made in the report, disclosing that in 2023 the water level had gone down only below the suction pipe in well no. 3, meaning thereby, the decrease in water level was more in the year 2024 as compared in 2023.

A short reply dated 04.09.2024 has been filed by the CPCB. Learned Counsel for the CPCB seeks time to look into the larger issue involved and also the report of the UPPCB and file a comprehensive report.

3. That, **Hon'ble NGT vide order** dated 21.05.2024 (copy enclosed as **Annexure-I**) in OA No. 557/2024 impleaded three respondents- CPCB, UP PCB and DM Prayagraj, and directed to file their response at least one week before the next date of hearing i.e., 06.09.2024. In this regard, CPCB vide letter dated-05.06.2024, reminder letter dated-07.06.2024 and e-mail dated-16.08.2024 communicated to UP PCB to coordinate with concerned office in District Prayagraj and provide a report in the matter. The report was awaited from UPPCB.

4. That CPCB vide dated 04.09.2024 submitted a short reply in the matter **before Hon'ble NGT (PB) as the report from concerned office in District** Prayagraj was not received. UP PCB has followed up the matter at local level with DM to investigate the matter.

5. That, in compliance **of Hon'ble NGT order dated 21.05.2024 in OA No.** 557/2024, District Magistrate Prayagraj constituted a local committee comprising members from (i) Groundwater Department Prayagraj, (ii) UP PCB Prayagraj, (iii) Mining Department Prayagraj and (iv) Nagar Nigam Prayagraj for site inspection. The said committee conducted a site inspection on 30.08.2024 and submitted that Karelabagh Water Pumping Station has 04 raw water intake well, located on left bank of river Yamuna to supply water to Khusrobagh Water Treatment Plant. Vide para 10 of the report, the committee informed that there is no mining on left bank of the river Yamuna near to Karelabagh Water Pumping Station, however, one mining lease is approved on opposite side at right bank of river Yamuna. The said mining lease at Khand -16 (total area 08 Ha) near Village-Madauka, Mirakpur and Mahewa (west) Tehsil Karchana, Janpad Prayagraj is issued to Project Proponent Shri Ravi Shankar Shukla S/O Shri Pramanand Shukla, R/o Saraykaji Kadan Urf Miyanpur, Thana-Line Bazar, District Jaunpur for mining of sand. The said mining lease is having EC validity upto 30.11.2026 from UP SEIAA and CTO validity upto 31.12.2027 from UP PCB. The mining work in said mining lease was reported to be stopped during July 2024-September 2024 as per provisions

of UP Minor Minerals (Concession) Rules 2021. The committee also reported about decrease of 1.28 m in ground water level in piezometer reading at M.L. Convent School Karelabagh.

6. That, in another matter titled as OA No. 974/2024 before **Hon'ble NGT** (PB) pertaining to illegal sand mining in District Prayagraj (Uttar Pradesh), a joint committee comprising (i) DM Prayagraj, (ii) UP PCB, (iii) CPCB and (iv) MoEF&CC IRO has been constituted vide order dated-27.09.2024 and the report of the joint committee has been submitted on 02.11.2024 before **Hon'ble NGT (PB). The joint committee inspected 03** mining sites in Prayagraj which included the above mentioned mining site also (i.e., Project Proponent Ravi Shankar Shukla (s/o Shri Pramanand Shukla, R/o Saraykaji Kadan Urf Miyanpur, Thana-Line Bazar, District Jaunpur) at **Khand -16** (total area 08 Ha) near Village-Madauka, Mirakpur and Mahewa (west) Tehsil Karchana, Janpad Prayagraj). The report of the said joint committee has been filed on 02.11.2024 before Hon'ble NGT (PB). The observations of joint committee in O.A. 974/2024 about the said 03 mining leases are enclosed at **Annexure-II**. The said joint committee observed presence of the mining boats which are used for illegal in-stream mining at two sites (Khand-14 & 16) in the past, based on satellite images.

7. That, in compliance of order dated 06.09.2024, it is further submitted as follows:

i. That the Sustainable Sand Mining Management Guidelines 2016 (copy enclosed as **Annexure-III)** - highlighted the impact of river mining in different chapters as below:

> *'a. **Extraction of bed material in excess of replenishment** by transport from upstream **causes the bed to lower (degrade) upstream and downstream** of the site of removal.' [Chapter 06. The Effect of Sand and Gravel Mining; page no 11]*

'f. ***Degradation can deplete the entire depth of gravel bed material****, exposing other substrates that may underlie the gravel, which could in turn affect the quality of aquatic habitat.* ***Lowering of ground water table in the flood plain because of lowering of riverbed level as well as river water level takes place because of extraction and draining out of excessive ground water from the adjacent areas****. So, if a floodplain aquifer drains to the stream, groundwater levels can be lowered as a result of bed degradation.' -[Chapter 06. The Effect of Sand and Gravel Mining; page no 11]*

'b. ***In-stream extraction of gravel from below the water level*** *of a stream generally* ***causes more changes to the natural hydrologic processes*** *than limiting extraction to a reference point above the water level.' – [Chapter 06. The Effect of Sand and Gravel Mining; page no 13]*

'c. ***In-stream extraction of gravel below the deepest part of the channel*** *(the thalweg) generally causes more changes to the natural hydrological processes than limiting extraction to a reference point above the thalweg.' – [Chapter 06. The Effect of Sand and Gravel Mining; page no 13]*

'.....Quarrying, mining and removal of sand from ***in-stream*** *and upstream of several rivers, which may have serious environmental impact on ephemeral, seasonal and perennial rivers and river beds and sand extraction may have an adverse effect on bio-diversity as well. Further it may also lead to* ***bed degradation*** *and sedimentation having a negative effect on the aquatic life.' – [Chapter 18. Regime of Law and Administrative Orders Relating to Mining of Minor Minerals; page no. 41]*

'b. For carrying out mining in proximity to any bridge and / or embankment, appropriate safety zone shall be worked out on case to

case basis to the satisfaction of SEAC / SEIAA, taking into account the structural parameters, locational aspects, flow rate etc., and no mining shall be carried out in the safety zone so worked out. ***No in-stream mining shall be allowed.*** *' – [Chapter 19. The Issues and Management of Mining in Cluster; page no. 51]*

That, in light of above, it can be concluded that the in-stream mining leads to impact on bed degradation, changes to natural hydrologic process and have adverse effect on bio- diversity, therefore, in-stream mining should not be carried out or permitted in mining lease area and the heavy machinery and boats which can be used for in-stream mining should not be allowed to be kept near the river, and stringent action should be taken against any persons found carrying out illegal mining, obstructing flow of the river, and keeping heavy machinery and mining boats near the river.

ii. That, time series data of all river mining leases/projects, arranged in order of location from upstream to downstream, should be maintained by the Mining Department. Similar database be maintained for all illegal mining cases noticed.

iii. That, Mining Department should analyse the cross sections data (of bed as well as floodplain) periodically to observe the changes in river bed and hydraulic gradient of the mining channel reaches to detect possible impacts of mining on natural gradient of the river and flood plain. The cross sections data of the river bed and floodplain may include – i) bed elevation ii) the elevation below which mining is not to be permitted (red line), iii) banks, iv) mean annual flood water level, v) 25 yr return flood water level, iv) 50/100 yr return flood water level.

iv. Under the provisions of the Mines and Minerals (Development & Regulation), Act, 1957 (hereinafter called as "MMDR Act, 1957"), the States are empowered to make the rules for regulating the grant of prospecting licenses or mining leases in respect of minor minerals and

making rules for preventing illegal mining, transportation and storage of minerals. The Section of 23(C) of MMDR Act 1957, empowered States to make rules for preventing illegal mining, transportation and storage of minerals. All such mining which qualifies illegal, is to be dealt with as per the provisions of MMDR Act, 1957 by the concerned state authorities.

v. That Central Government has issued EIA Notification 1994 and 2006 and by these notifications made it mandatory to obtain prior Environmental Clearance for projects/activities covered under the Schedule of the notification from Central Government/SEIAA, including projects for mining of minor minerals. Further, it is mandatory to obtain Consent from SPCB under the Water (Prevention and Control of Pollution) Act 1974 / the Air (Prevention and Control of Pollution) Act 1981 for the projects/activities including projects for mining of minor minerals.

vi. **That in the matter of Hon'ble NGT (PB) New Delhi in O.A. No. 360/2015** National Green Tribunal Bar Association vs. Virendra Singh (State of Gujarat), a report dated 30.01.2020 was prepared by an expert committee **formed by order of Hon'ble NGT** (PB) comprising of representatives of Ministry of Environment, Forest and Climate Change, Central Pollution Control Board, Indian Institute of Forest Management-Bhopal, Institute of Economic Growth-New Delhi and Madras School of Economics, Chennai to recommend a scale of compensation to NGT (PB) to deal with cases of illegal sand mining in whole of country and the report was submitted to NGT on 30.01.2020. Copy of the report dated 30.01.2020 is annexed herewith as **Annexure-IV**.

vii. That **Hon'ble** NGT vide order dated 26.02.2021 in the aforesaid OA accepted the recommendations of the expert committee and directed for development of appropriate mechanism in states for assessment and recovery of compensation of environmental damage due to illegal (river) sand mining by using the approved scale of compensation. Copy of the order dated 26.02.2021 of this Hon'ble Tribunal in O.A. 360/2015 is annexed herewith as **Annexure-V**.

viii. That as directed by the Hon'ble NGT vide order dated 26.02.2021 in the aforesaid OA, CPCB vide letter dated 11.06.2021 also issued directions to Environment Secretaries of States/UTs to evolve an appropriate mechanism for assessment of compensation in all Districts of the State and for utilization of recovered compensation for restoration of environment by preparing appropriate action plan as per order dated 26.02.2021. Copy of letter dated 11.06.2021 of the CPCB to Environment Secretaries of States/UTs is annexed herewith as **Annexure-VI.**

ix. That, in light of the above submission, it is respectfully submitted that this Answering respondent i.e. CPCB, shall abide by any order(s) or direction(s) passed by this Hon'ble tribunal in the instant OA. and further craves leave of the Hon'ble Tribunal to file additional reply, in future, if required.

Nazimuddin
Scientist 'F'
Central Pollution Control Board
20.12.2024

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, DELHI

ORIGINAL APPLICATION NO. 557 of 2024

In the matter of: -

News Item titled **"Prayagraj यमुना में जलस्तर घटने के साथ बना पेयजल संकट, नैनी की तरफ अनियंत्रित खनन पर भी नियंत्रण की तैयारी"** appearing in Amar Ujala dated 13.04.2024

AFFIDAVIT

I, **Nazimuddin**, working as Scientist 'F' in Central Pollution Control Board, Parivesh Bhawan, East Arjun Nagar, Delhi, the Respondent No. 1, in the above matter, do hereby solemnly affirm, declare on oath and state as under: -

1. That I, the deponent herein is the authorized representative to represent the Respondent CPCB in the present case, and as such, I am well conversant with the facts and circumstances of the present case on the basis of the information derived from the official records, and hence, I am competent to verify, sign and swear this affidavit on behalf of the Respondent CPCB.
2. That the accompanying reply may be read part and parcel of the present affidavit.
3. That the accompanying reply has been drafted and filed under my instructions and authority the contents thereof are true and correct on the basis of the records maintained during ordinary course of business of CPCB and available records and documents and the contents of the same are read over and explained to me and are not repeated herein for the sake of brevity.

NOTARY PUBLIC
Ram Krishan Gupta
Area-Delhi
Regd. No. 10666/14
GOVT OF INDIA

DEPONENT

नाजिमउद्दीन / Nazimuddin
वैज्ञानिक 'एफ' / Scientist 'F'
केंद्रीय प्रदूषण नियंत्रण बोर्ड
Central Pollution Control Board
(पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार)
(M/o Environment, Forest And Climate Change, Govt. of India)
परिवेश भवन, पूर्वी अर्जुन नगर, दिल्ली–110032
Parivesh Bhawan, East Arjun Nagar, Delhi-110032

VERIFICATION

Verified at Delhi on this day of 20 DEC 2024 2024 that the contents of the above reply are correct and true on the basis of the record of the cases as mentioned in the day to day affairs of the CPCB. Nothing has been concealed therefrom or mis-stated.

DEPONENT

नाजिमउद्दीन / Nazimuddin
वैज्ञानिक 'एफ' / Scientist 'F'
केंद्रीय प्रदूषण नियंत्रण बोर्ड
Central Pollution Control Board
(पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय, भारत सरकार)
(M/o Environment, Forest And Climate Change, Govt. of India)
परिवेश भवन, पूर्वी अर्जुन नगर, दिल्ली–110032
Parivesh Bhawan, East Arjun Nagar, Delhi-110032

NOTARY PUBLIC
Ram Krishan Gupta
Area-Delhi
Regd. No. 10666/14
GOVT OF INDIA

ATTESTED
NOTARY
DELHI (INDIA)

20 DEC 2024

Annexure- I

Item No. 13 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 557/2024

News Item titled **"Prayagraj यमुना में जलस्तर घटने के साथ बना पेयजल संकट, नैनी की तरफ अनियंत्रित खनन पर भी नियंत्रण की तैयारी"** appearing in Amar Ujala dated 13.04.2024

Date of hearing: 06.09.2024

CORAM: HON'BLE MR. JUSTICE PRAKASH SHRIVASTAVA, CHAIRPERSON
HON'BLE MR. JUSTICE ARUN KUMAR TYAGI, JUDICIAL MEMBER
HON'BLE DR. A. SENTHIL VEL, EXPERT MEMBER

Respondent: Ms. Sthavi Asthana, Adv. for UPPCB
Mr. Raj Kumar, Adv. for CPCB
Mr. Mukesh Verma & Ms. Vatsala Tripathi, Advs. for DM, Prayagraj (Through VC)

ORDER

1. In this original application, registered *suo motu*, the Tribunal is examining the issue of decrease in water level due to heat and uncontrolled sand mining on the bank of Yamuna in Prayagraj. An apprehension was raised in the news item that on account of the decreasing water level in the river even the pump stations supplying water may not work.

2. In terms of the direction of the Tribunal, the UPPCB has filed the report on 31.08.2024. There are four raw water intake wells at Karelabagh on the bank of River Yamuna setup by Prayagraj Nagar Nigam to cater for the requirement of providing clean water supply to Karelabagh, Shahganj, Jonsenganj and other places. The report indicates depleting/decreasing water level in the river resulting in disfunctioning of pumps. It clearly mentions that out of the three pumps, pumping the water to the Khusrobagh treatment plant, the operation of the pump was stopped on 19.06.2024 since the intake of wells no. 1 and 2 had gone

below the inlet suction point. It also mentions that during the summer, the water level of the river Yamuna had gone down. Comparison with 2023 has been made in the report, disclosing that in 2023 the water level had gone down only below the suction pipe in well no. 3, meaning thereby, the decrease in water level was more in the year 2024 as compared in 2023.

3. A short reply dated 04.09.2024 has been filed by the CPCB. Learned Counsel for the CPCB seeks time to look into the larger issue involved and also the report of the UPPCB and file a comprehensive report. Let the same be filed within 8 weeks by way of affidavit through e-filing.

4. List on 23.12.2024.

Prakash Shrivastava, CP

Arun Kumar Tyagi, JM

Dr. A. Senthil Vel, EM

September 06, 2024
Original Application No. 557/2024
dv..

Annexure-II

Observations of joint committee in O.A. 974/2024 about the said 03 mining leases

"2.1. Inspection of mining activity at Village Vidyapeeth Mahewa

2.1.1. Observations:

Observations based on Joint inspection and available records with RO-MOEF&CC and RO-UPPCB are as follows:

*1. The mining department has granted a mining lease of **8 Hectares total area** for sand mining from the River Yamuna **at Khand-16 near Village— Madauka, Mirakpur and Mahewa (West)** Shri Ravishankar Shok12, S o Shri PramanandShukia, Resident— SaraykajiKadanUrfMiyanpur, Thana—Line Bazar, District- Jaunpur.*

2. Notice for e-tendering along with e-auction for the lease was issued by the District Magistrate, Prayagraj on 30.05.2020. (A copy of the e-auction notice is annexed as Annexure No. 2)

3. Letter of Intent (LoI) for the lease was issued by the District Administration to the Project Proponent (PP) on 11.08.2020. The LoI was issued for 8-hectare mine lease area (Quantity- 92973 m3 per year) for 5 years. (A copy of LoI is annexed as Annexure No. 3)

4. The public hearing for the said mining project was conducted on 20.10.2021.(Copy of MoM of public hearing is annexed as Annexure No. 4)

5. Environmental Clearance (EC) has been granted for sand mining in the lease area by State Level Environment Impact Assessment Authority (SEIAA), Uttar Pradesh on 08.03.2018 to Smt. Sunita Singh w/o Shri Raviraj Singh, Allahabad, vide letter no. 222/Parya/SEAC./3987/2018 dated 08.03.2018, which was further transferred on 15.10.2020 to Shri Ravi Shankar Shukla S/o Shri PramanandShukia, Resident-SaraykajiKadanUrfMiyanpur, Thana- Line Bazar, District-Jaunpur for period up to 07.03.2023. Further EC was granted/renewed to the Project Proponent on 09.10.2023 for a period up to 30.11.2026. (A copy of EC is annexed as Annexure No. 5)

6. The above-mentioned mining lease has been granted by District Magistrate, Prayagraj (Mining Department) for the duration of 01.12.2021 to 30.11.2026.

7. The PP was granted Consent to Operate (CTO) under the Water (PCP) Act, 1974, and the Air (PCP) Act, 1981 on 17.11.2023, which is valid from 17.11.2023 to 31.12.2027. (Copy of CTO is annexed as Annexure No. 6)

8. As per the mining department. Prayagmys total of 174744 m3 of River Bed Material (RBM) has been excavated by the project proponent (from December 2021 to June 2024). Year wise quantity of mining details is as below:

Year	*Quantity excavated (m^3)*	*Permitted quantity (m^3)*
Dec-2021-Dec 2022	*56236*	*92973*
Jan-2023-Dec-2023	*58691*	*92973*
Jan-2024-June 2024	*59517*	*92973*

*9. During the visit. it was observed that the **mining operation had not started post-monsoon** and preparation for carrying out the mining operation was going on. The representative of the project proponent has informed us that the mining process will*

begin as soon as the water level on the river banks decreases. Also, no mining operation was observed beyond the lease area at this site.

10. However. ***the satellite image shows that mining was conducted within and near the above lease area of 8 ha on 09.06.2024 in an unsaturated zone by river boats etc. which is against the Sustainable Sand Mining Guidelines. 2020 and Mining plan. etc****. A related satellite image Is enclosed as Annexure-7.*

11. During the visit, all machinery was found removed from the site. Construction of a temporary camp office was under process. No weighing bridge and display board with mining lease information was available on site.

12. During the visit, following violation with respect to EC & CTO conditions. Mining Plan, Mining guideline etc were observed:

a) No PTZ camera was found installed at the mining site. It is informed by the representative of the Project Proponent that the PTZ camera will be installed when the mining operation starts.

b) During the visit, no pillar was found in the lease area. It was informed by the representative of the project proponent that all pillars have been removed due to the monsoon and will be reinstalled when the mining operation starts. Necessary action may be taken by the Mining Department to ensure the installation of a pillar within the lease area.

c) The project proponent (PP) has been irregular in the submission of the six monthly compliance reports to the Regional Office. SELAA-[JP.

d) The PP has not carried out adequate plantation in compliance with CTO & EC conditions

e) The PP has not carried out the hydro-geological study.

f) The PP has not conducted a replenishment study of the area.

g) The PP has not conducted third-party monitoring of various parameters including ambient air quality etc.

h) The PP has yet not set up a solar power-mediated lighting system in their site office.

i) The PP has yet not constructed two toilets and one hand pump in the mine office.

j) During the visit, it was observed that roads used for the transportation of sand were unpaved and no dust control measures such as water sprinkling, plantation on both sides of the road, etc have been carried out.

k) The PP has yet not conducted the digital processing of the entire lease area so far.

2.2. Inspection of sand mining activity at Village Baswar

1.2.1. Observations:

Observation based on Joint inspection and available records with ROMOEF&CC and RO-UPPCB is as follows:

*1. Mining lease of **total area 4.69 Hectare** has been granted for sand mining from River Yamuna at **Khand-14 near Village- Baswar, Tehsil- Karchhana, District-Prayagraj** to Shri Surendra Kumar S/o Shri Shivinurti Bharatiy, Resident-village-Bemi, Post- Garapur Thana- Tharwai, Tehsil- Phulpur, District-Prayagraj by Mining department.*

2. Notice for E- tendering along with E- auction for the lease was issued by the District Magistrate, Prayagraj on 07.09.2017. (E-auction notice is annexed as Annexnre No. 8)

3. Letter of Intent (LoI) for the lease was issued by the District Administration to the Project Proponent (PP) on 11.05.2022. The Lol was issued for 4.69 hectares mine lease area (Quantity- 70454 m3 per year) for the period of 5 years. (Copy of LoI is annexed as Annexure No. 9)

4. Environmental Clearance (EC) has been granted for mining in the lease area by State Level Environment Impact Assessment Authority (SEIAA), Uttar Pradesh on 08.03.2018 as amended on 21.12.2022.

Further, EC is extended on 29.05.2023 for a period up to the revised LoI/approved mining plan whichever is earliest. (A copy of EC is annexed as Annexure No. 10)

5. The PP was granted Consent to Operate (CTO) under the Water (PCP) Act, 1974, and the Air (PCP) Act, 1981 on 24.04.2023, which is valid from 24.04.2023 to 31.12.2027. (Copy of CTO is annexed as Annexure No. 11)

6. The above-mentioned mining lease has been granted by District Magistrate, Prayagraj (Mining Department) for the duration of 09.01.2023 to 08.01.2028.

7. As per the mining department, Prayagraj, total of 108517 m3 of minerals has been excavated by the project proponent (from January 2023 to October 2024). Year-wise quantity of mining details are as below:

Year	*Quantity excavated (m^3)*	*Permitted quantity (m^3)*
Jan, 2023-Dec,2023	*70453*	*70454*
Jan, 2024-Oct, 2024	*38064*	*70454*

8. During the visit, no pillar was found in the lease area. It is informed by the representative of the project proponent that all pillars have been removed due to the monsoon and will be reinstalled when the mining operation starts. Necessary action may be taken by the District Mining Department to ensure the installation of a pillar within the lease area.

*9. During the visit, it was observed that the **mining operation had not started post-monsoon** and preparation for carrying out the mining operation was going on. It is informed by the representative of the project proponent that the mining process will begin as soon as the water level on the river banks decreases. Also, no mining operation was observed beyond the lease area at this site.*

*10.However, the satellite image on dated 09.06.2024 shows that **mining was conducted within and near the above lease area of 4.69 ha**, which is against the Sustainable Sand Mining Guidelines, 2020 and Mining plan, etc. A related satellite image is enclosed as Annexure-7.*

11.Satellite image dated 09.06.2024, clearly reflected that the mining was conducted within the lease area and outside of the lease area (within the river) by using large number of river boats, etc.. which is against the mining plan*.*

12. During the visit, all machinery was found removed from the site except the weighing bridge. Temporary camp office was installed at the site with a computer. A display board with the name of Project Proponent was available on camp office

13. During the visit, following violation with respect to EC & CTO conditions. Mining Plan, Mining guideline etc were observed:

a) No PTZ camera was found installed at mining site. It is informed by the representative of the Project Proponent that the PTZ camera will be installed when the mining operation starts.

b) The project proponent (PP) has been irregular in the submission of the six monthly compliance reports to the Regional Office. SELAA-UP. and UPPCB.

c) The PP has not carried out adequate plantation in compliance of CTO & EC conditions.

d) The PP has yet not carried out the hydro-geological study so far.

e) The PP has not conducted a replenishment study of the area.

f) The PP has not conducted third-party monitoring of various parameters including ambient air quality etc.

g) Roads used for the transportation of sand were unpaved and no dust control measures such as water sprinkling, plantation on both sides of the road. etc have been carried out.

h) As per the EC 2018, it is stated that the CSR plan with a minimum Rs 5 Lakh work to be executed with the installation of five hand pump. solar light in the village of street and construction of the two toilets at the primary school, etc." No such work has been done so far.

i) The PP has yet not conducted the digital processing of the entire lease area so far.

2.3. Inspection of sand mining activity at Village Adampur (Madaripur to Sadiyapur)

2.3.1. Observations:

Observation based on Joint inspection and available records with ROMOEF& CC and RO-UPPCB is as follows:

1. Mining lease of ***total area 5 Hectare*** *has been granted for sand mining from River Yamuna at* ***Khand -21 in Village- Adampur (Madaripur to Sadiyapur)*** *to M/s Ram Ratan Construction. Shri Ram Ratan Nishad S o Late Lallu Lal, Resident- 6/41 Nai Jhunsi Bazar. Thana- Jhunsi. Tehsil Phulpur. District-Prayagraj by Mining department.*

2. Notice for e-tendering along with e-auction for the lease was issued by the District Magistrate. Prayagraj on 20.0S?020. (e-auction notice is annexed as Annexure No. 12)

3. Letter of Intent (LoI) for the lease was issued by the District Administration to the Project Proponent (PP) on 24.12.2020. The LoI was issued for 5-hectare mine lease area (Quantity- 15000 m3 per year) for the period of 5 years. (A copy of LoI is annexed as Annexure No. 13)

4. First Environmental Clearance (EC) has been granted for mining in the lease area by State Level Environment Impact Assessment Authority (SEIAA), Uttar Pradesh on 10.01.2018 which was further transferred on 19.10.2021 to M/s Ram Ratan Construction for a period up to one year. Further EC was granted to the Project Proponent on 15.12.2023. (A copy of EC is annexed as Annexure No. 14)

5. The Project Proponent has not obtained Consent to Operate (CTO) under the Water (PCP) Act, 1974. and the Air (PCP) Act, 1981.

6. The above-mentioned mining lease has been granted by District Magistrate, Prayagraj (Mining Department) for the duration of 01.12.2021 to 30.11.2026.

7. As per the Mining department, Prayagraj total 15675 m3 of River Bed Material (RBM) has been excavated by the project proponent (from December 2021 to June 2024). Year-wise quantity of mining details are as below:

Year	*Quantity excavated (m^3)*	*Permitted quantity (m^3)*
Dec-2021-Dec 2022	*8175*	*15000*
Jan-2023-Dec-2023	*6438*	*15000*
Jan-2024-June 2024	*1062*	*15000*

8. No mining operation was observed during the site visit. Path preparation for the movement of the vehicle was also observed at the site. It is informed by the representative of the project proponent that ***the mining process has not started yet****. However,* ***a small heap of sand was found stored in the lease area****. No mining operation was observed beyond the lease area at this site.*

9. However, the satellite image on dated 09.06.2024 shows ***that mining was conducted within and near the above lease area of 5 ha,*** *which is against the Sustainable Sand Mining Guidelines. 2020 and Mining plan, etc. A related satellite image is enclosed as Annexure-7*

10. During the visit, no machinery was found on site. No temporary camp office was found on site. No weighing bridge and display board with mining lease information was available on site.

11. During the visit, following violation with respect to EC & CTO conditions. Mining Plan, Mining guideline etc were observed:

a) No PTZ camera was found installed at the mining site. It is informed by the representative of the Project Proponent that the PTZ camera will be installed when the mining operation starts.

b) During the visit, no pillar was found in the lease area. It is informed by the representative of the project proponent that all pillars have been removed due to the monsoon and will be reinstalled when the mining operation starts. Necessary action may be taken by the Mining Department to ensure the installation of a pillar within the lease area.

c) The project proponent (PP) has been irregular in the submission of the six monthly compliance reports to the Regional Office. SEIAA-UP, and UPPCB.

d) The PP has not carried out adequate plantation in compliance with CTO & EC conditions.

e) The PP has not carried out the hydro-geological study as per the EC condition.

f) The PP has not accrued out replenishment study of the area.

g) The PP has not conducted third-party monitoring of various parameters including ambient air quality etc.

h) During the visit, it was observed that roads used for the transportation of sand were unpaved and no dust control measures such as water sprinkling. plantation on both sides of the road. etc have been carried out as per EC condition.

i) The PP has yet not conducted the digital processing of the entire lease area so far.

***

348

सत्यमेव जयते

SUSTAINABLE SAND MINING MANAGEMENT GUIDELINES 2016

पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
इंदिरा पर्यावरण भवन, जोर बाग रोड, नई दिल्ली–110 003
Ministry of Environment, Forest and Climate Change
Indira Paryavaran Bhavan, Jor Bagh Road, New Delhi - 110 003
www.moef.nic.in

Acknowledgment

The Sustainable Sand Mining Management Guidelines 2016, has been prepared after extensive consultation with the States and stakeholders over a period of last one year. The Guideline assimilates the knowledge and experience of stakeholder. The main objective of the Guidelines is to ensure sustainable sand mining and environment friendly management practices in order to restore and maintain the ecology of river and other sand sources. The team of the officers of Ministry of Environment, Forest and Climate Change who have worked for preparing these Guidelines comprised of following:

1. Shri Manoj Kumar Singh, Joint Secretary
2. Dr. U. Sridharan, Scientist 'F'
3. Dr. R.B. Lal, Scientist 'D'
4. Dr. Sonu Singh, Scientist 'D'

SUSTAINABLE SAND MINING MANAGEMENT GUIDELINES

TABLE OF CONTENTS

APPENDIX

प्रकाश जावडेकर
Prakash Javadekar

सत्यमेव जयते

राज्य मंत्री (स्वतंत्र प्रभार)
MINISTER OF STATE (INDEPENDENT CHARGE)
पर्यावरण, वन एवं जलवायु परिवर्तन
ENVIRONMENT, FOREST & CLIMATE CHANGE
भारत सरकार / GOVERNMENT OF INDIA

FOREWORD

Environmental Protection and Sustainable Development have been the cornerstones of the policies and procedures governing the industrial and other developmental activities in India. The Ministry of Environment, Forest and Climate Change has taken several policy initiatives and enacted environmental and pollution control legislations to prevent indiscriminate exploitation of natural resources and to promote integration of environmental concerns in developmental projects. One such initiative is the Notification on Environmental Impact Assessment (EIA) of developmental projects issued on 14th September, 2006 under the provisions of Environment (Protection) Act, 1986, making EIA mandatory for certain categories of developmental projects.

Another land mark decision has been taken with the new notifications dated 15.01.2016 and 20.01.2016 on mining of minor minerals and constitution of District Level Environment Impact Assessment Authority and District Level Environment Appraisal Committee. This will ensure environmentally sustainable mining especially for sand and gravel under close supervision of district authorities. Use of information technology and information technology enabled services for scientific monitoring of mining and transportation of mined out material is another important feature of above notification.

Sand and gravel are one of the most important construction materials. Ensuring their availability is vital for the development of the infrastructure in the country. There are different sources of sand and gravel, the most important among them is the river. As the requirement of these construction materials is on rise, they also are very vital for the health, physical character of the river and the different important functions of the river. The extraction of sand and gravel from the river bodies has to be regulated and done with adoption of required environmental safeguards.

In view of evolving scenario in industry and development sector, My Ministry has prepared a "Sustainable Sand Mining Management Guidelines". The Guidelines *inter-alia* focus on preparation of District Survey Report; Management Plan; Marine Sand Mining and Impact on Marine Biodiversity; Issues and Management of Mining in Cluster; Management of Sand Deposited after Flood on Agricultural Field of Farmers; Mining of Sand from Agricultural Field; Monitoring System for Sustainable Sand Mining using Information Technology System; Creation of District Level Environment Impact Assessment Authority (DEIAA) and District Level Expert Appraisal Committee (DEAC) for granting Environment Clearance for Mining of Minor Minerals; Exemption of certain cases for requirement of Environment Clearance and Standard Environmental Conditions for Sustainable Sand Mining.

The Guidelines will help the Departments of Mines and Geology, State Pollution Control Boards/Committees, Industries, Regulators, Authorities and various Stakeholders to ensure environmentally sustainable mining in the Country.

(Prakash Javadekar)

Paryavaran Bhawan, Jor Bagh Road, New Delhi-110 003
Tel.: 011-24695136, 24695132, Fax : 011-24695329
www.youtube.com/prakashjavadekar www.facebook.com/prakashjavadekar
www.twitter.com/prakashjavadekar e-mail :mefcc@gov.in
website : www.prakashjavadekar.com

अशोक लवासा
ASHOK LAVASA, IAS

सत्यमेव जयते

सचिव
भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
Secretary
Government of India
Ministry of Environment, Forest and Climate Change

PREFACE

Sand is naturally occurring granular material composed of finely divided rock and mineral particles. Sand and gravel together known as aggregate, represent the highest volume of raw material used on earth. The mining of aggregate has been continuing for many years. Now the mining of aggregates has reached a level threatening the environment and ecosystem besides also reaching a level of scarcity that would threaten the economy. It is recommended that sand and aggregate mining, and quarrying should be done only after sound scientific assessment and adopting best practices to limit the impact on the environment.

The main objectives of the Guidelines, inter-alia, includes 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 mined out material; conservation of the river equilibrium and its natural environment by protection and restoration of the ecological system; avoid aggradation 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 pollution of river water leading to water quality deterioration; to prevent depletion of ground water reserves due to excessive draining out of ground water; 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. Emphasis is given to the setting up of monitoring plans that will provide data on profile changes and sediment transport capacity to enable the authorities to evaluate the long-term effect of the mining activities both upstream and downstream of sand extraction sites. Special emphasis is given on monitoring of the mined out material, which is key to the success of environment management plan. So use of IT and IT enabled services for effective monitoring of the quantity of mined out material and transportation along with process reengineering has been made a part of the Guideline. The Guidelines propose delegation of responsibility and authority to the cutting edge level i.e. the District Environment Impact Assessment Authority along with streamlining the process of impact assessment, environment management plan and environment clearance in cluster situation.

(Ashok Lavasa)

New Delhi
Date: 15-03-2016

इंदिरा पर्यावरण भवन, जोर बाग रोड़, नई दिल्ली-110 003 फोन : (011) 24695262, 24695265, फैक्स : (011) 24695270
INDIRA PARYAVARAN BHAWAN, JOR BAGH ROAD, NEW DELHI-110 003 Ph. : (011) 24695262, 2465265, Fax : (011) 24695270
E-mail : secy-moef@nic.in, alavasa@nic.in, Website : moef.gov.in

EXECUTIVE SUMMARY

The sand and gravel are one of the most important construction materials. Ensuring their availability is vital for the development of the infrastructure in the country. There are different sources of sand and gravel, the most important among them is the river. As the requirement of these construction materials is on rise, they also are very vital for the health, physical character of the river and the different important functions of the river. The extraction of sand and gravel from the river bodies has to be regulated and done with adoption of required environmental safeguards.

For making available these resources, a mapping of these resources at the district level, identification of appropriate sites for extraction, appraisal of the extraction process, putting in place the required environmental safeguards, and rigorous monitoring of the volume of extracted material is required to ensure sustainability of the entire process.

The district is the unit of administration which is best placed to do the mapping of these resources, adopt the best environmental practices for extraction of these materials and monitor its extraction and movement. The large number of leases which are awarded, the scattered geographical location of the availability of these materials and decentralized requirement and usage of the sand and aggregates also places districts in a unique position to play a vital role in adoption of environmental safeguards needed for sustainable extraction of river sand and gravel.

Recommendations for management of sustainable sand extraction are the key objective of the Guidelines. Emphasis is given to the setting up of monitoring plans that will provide data on profile changes and sediment transport capacity to enable the authorities to evaluate the long-term effect of the mining activities both upstream and downstream of sand extraction sites.

Special emphasis is given on monitoring of the mined out material, which is key to the success of environment management plan. So use of IT and IT enabled services for effective monitoring of the quantity of mined out material and transportation along with process reengineering has been made a part of the Guideliness. The Guidelines proposes delegation of responsibility and authority to the cutting edge level i.e. the District Environment Impact Assessment Authority along with streamlining the process of impact assessment, environment management plan and environment clearance in cluster situation.

Promotion of manufactured sand, artificial sand and alternative technologies in construction materials and processes are also required for reducing the dependence and demand on naturally occurring sand and gravel. Development of slag sand, sand from stone chips and there certification under BIS is an important step in this direction.

INTRODUCTION

Sustainable Development is built on three pillars - environmental, social and economic. Sustainable development cannot be achieved if the environment is protected but poverty is prevalent in a significant part of the population. Similarly, sustainable development cannot be achieved through inappropriate economic growth, if it undermines the environment in which people and businesses exists. These Guideliness support that fundamental concept, promoting environmental protection, limiting negative physiological, hydrological and social impacts under pinning sustainable economic growth.

Sand and gravel have long been used as aggregate for construction of roads and building. Today, the demand for these materials continues to rise. In India, the main sources of sand are river flood plain, coastal sand, paleo channel sand, and sand from agricultural fields.

River sand mining is a common practice as habitation concentrates along the rivers and the mining locations are preferred near the markets or along the transportation route, for reducing the transportation cost. River sand mining can damage private and public properties as well as aquatic habitats. Excessive removal of sand may significantly distort the natural equilibrium of a stream channel.

Removing sediment from the active channel bed in river interrupt the continuity of sediment transport through the river system, disrupting the sediment mass balance in the river downstream and induces channel adjustments (usually incision) extending considerable distances (commonly one kilometer or more) beyond the extraction site.

The magnitude of the impact basically depends on the magnitudes of the extraction relative to bed load sediment supply and transport through the reach. Implementation of the principles and processes outlined in this Guidelines will limit the negative externalities of sand and gravel mining.

NEED FOR POLICY GUIDELINES

Sand is naturally occurring granular material composed of finely divided rock and mineral particles between 150 micron to 4.75 mm in diameter (IS 383-1970). Sand is formed due to weathering of rocks due to mechanical forces. In the process the weathered rocks forms gravel and then sand.

Sand and gravel together known as aggregate, represent the highest volume of raw material used on earth after water. The mining of aggregate has been continuing for many years. Now the mining of aggregates has reached a level threatening the environment and ecosystem besides also reaching a level of scarcity that would threaten the economy. It is recommended that sand & aggregate mining, and quarrying should be done only after sound scientific assessment and adopting best practices to limit the impact on the environment.

It is also felt that the greater use of substitute material (Manufactured Sand, artificial sand etc.) & construction technology, and sustainable use of the resource could drastically reduce adverse impact of mining on the environment.

OBJECTIVE OF THE GUIDELINES

The Guideliness has been based on the following principles:

- Uncontrolled sand mining is not sustainable.
- Compliance with present and future legislation and regulations on the subject is mandatory and not voluntary.
- Each lease holder should be given the opportunity to self-regulate to the extent that it can demonstrate compliance with legislation and regulations.
- Where self- regulation fails to deliver compliance with legislation and regulations, increased formal enforcement and monitoring should be implemented with punitive measures applied in line with the legal framework.
- There is a need to protect the environment and the right of the population to live in clean and safe surroundings, with the need to use natural resources in a way that will make a positive and sustainable contribution to the economy.

The main objectives of the Guidelines

- To ensure that sand and gravel mining is done in environmentally sustainable and socially responsible manner.
- To ensure availability of adequate quantity of aggregate in sustainable manner.
- To improve the effectiveness of monitoring of mining and transportation of mined out material.

- Ensure conservation of the river equilibrium and its natural environment by protection and restoration of the ecological system.
- Avoid aggradation at the downstream reach especially those with hydraulic structures such as jetties, water intakes etc.
- Ensure that 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.
- Avoid pollution of river water leading to water quality deterioration.
- To prevent depletion of ground water reserves due to excessive draining out of ground water.
- To prevent ground water pollution by prohibiting sand mining on fissures where it works as filter prior to ground water recharge.
- To maintain the river equilibrium with the application of sediment transport principles in determining the locations, period and quantity to be extracted.
- Streamlining and simplifying the process for grant of environmental clearance (EC) for sustainable mining.

THE EFFECT OF SAND AND GRAVEL MINING

Mining within or near riverbed has a direct impact on the stream's physical characteristics, such as channel geometry, bed elevation, substratum composition and stability, in-stream roughness of the bed, flow velocity, discharge capacity, sediment transport capacity, turbidity, temperature etc. Alteration or modification of the above attributes may cause hazardous impact on ecological equilibrium of riverine regime. This may also cause adverse impact on in-stream biota and riparian habitats. This disturbance may also cause changes in channel configuration and flow-paths.

The effects of sand and gravel mining are as follows:

a) Extraction of bed material in excess of replenishment by transport from upstream causes the bed to lower (degrade) upstream and downstream of the site of removal.

b) In-stream habitat is impacted by increase in river gradient, suspended load, sediment transport and sediment deposition. Excessive sediment deposition for replenishment increases turbidity which prevents penetration of light required for photosynthesis and reduces food availability of aquatic fauna.

c) Riparian habitat including vegetative cover on and adjacent to the river banks it controls erosion, provide nutrient inputs into the stream and prevents intrusion of pollutants in the stream through runoff. Bank erosion and change of morphology of the river can destroy the riparian vegetative cover.

d) Bed degradation are responsible for channel shifting, causing loss of properties and degradation of landscape, it can also undermine bridge supports, pipe lines or other structures.

e) Degradation may change the morphology of the river bed, which constitutes one aspect of the aquatic habitat.

f) Degradation can deplete the entire depth of gravelly bed material, exposing other substrates that may underlie the gravel, which could in turn affect the quality of aquatic habitat. Lowering of ground water table in the flood plain because of lowering of riverbed level as well as river water level takes place because of extraction and draining out of excessive ground water from the adjacent areas. So, if a floodplain aquifer drains to the stream, groundwater levels can be lowered as a result of bed degradation.

g) Lowering of the water table can destroy riparian vegetation.

h) Excessive pumping of ground water in the process of mining in abandoned channels depletes ground water causing scarcity of irrigation and drinking water. In extreme cases it may create ground fissures and subsidence in adjacent areas.

i) Flooding is reduced as bed elevations and flood heights decrease, reducing hazard for human occupancy of floodplains and the possibility of damage to engineering works.

j) The supply of overbank sediments to floodplains is reduced as flood heights decrease.

k) An un-scientific and unregulated sand and gravel mining tends to increase channel bank

scouring and erosion. This causes a large degree of meandering of rivers and sometimes it could be in kms.

l) Rapid bed degradation may induce bank collapse and erosion by increasing the heights of banks.

m) Polluting ground water by reducing the thickness of the filter material especially if mining is taking place at top of recharge fissures.

n) Choking of sand layer which acts as filter for ingress of ground water from river by dumping of finer material, compaction of filter zone due to movement of heavy vehicles. It also reduces the permeability and porosity of the filter material.

o) Removal of gravel from bars may cause downstream bars to erode if they subsequently receive less bed material than is carried downstream from them by fluvial transport.

p) Ecological effects on bird nesting, fish migration, angling, etc.

q) Indiscrete mining activities lead to increased concentration of suspended sediment in the river which in turn causes siltation of water resources projects.

r) Un-scientific and unregulated sand and gravel mining leads to the severe health hazards like air quality degradation and dust fog.

s) Direct destruction from heavy equipment operation; discharges from equipment and refueling.

t) Biosecurity and pest risks.

u) Impacts on coastal processes.

The other deleterious impacts of indiscrete mining include

Loss of riparian habitat resulting from direct removal of vegetation along the stream bank to facilitate the use of a dragline or through the process of lowering the water table, bank undercutting, and channel incision. The physical composition and stability of substrates are altered as a result of in-stream mining and most of these physical effects may exacerbate sediment entrainment in the channel.

Furthermore, the process of in-stream mining and gravel washing produces fine sediments under all flow conditions, resulting in a deposition of fine sediment in riffles as well as other habitats at low discharge. Excess sediment is considered the greatest pollutant in waters and constitutes one of the major environmental factors in the degradation of stream fisheries.

However, in-stream mining may contribute additional sediment to downstream reaches due to the disruption of substrate stability. Once sediment enters the stream, it is best to let natural geomorphological and hydrological processes reach a dynamic equilibrium, rather than further exacerbating the situation by additional disturbance.

All other things being equal:

a) Extracting gravel from an excavation that does not penetrate the water table and is located away from an active stream channel should cause little or no change to the natural hydrological processes unless the stream captures the pit during periods of flooding.

b) In-stream extraction of gravel from below the water level of a stream generally causes more changes to the natural hydrologic processes than limiting extraction to a reference point above the water level.

c) In-stream extraction of gravel below the deepest part of the channel (the thalweg) generally causes more changes to the natural hydrological processes than limiting extraction to a reference point above the thalweg.

d) Excavating sand and gravel from a small straight channel with a narrow floodplain generally will have a greater impact on the natural hydrological processes than excavations on a braided channel with a wide floodplain.

e) Extracting sand and gravel from a large river or stream will generally create less impact than extracting the same amount of material from a smaller river or stream.

f) Over-extraction of gravel can destabilise channels and banks, and/or affect the ecologic functioning of rivers particularly if undertaken at the wrong time, or in the wrong place, or in a way that damages the river bed or margins.

GENERAL APPROACH TO SUSTAINABLE SAND AND GRAVEL MINING

Following considerations should be kept in mind for sand / gravel mining:

a) Parts of the river reach that experience deposition or aggradation shall be identified first. The Lease holder/ Environmental Clearance holder may be allowed to extract the sand and gravel deposit in these locations to manage aggradation problem.

b) The distance between sites for sand and gravel mining shall depend on the replenishment rate of the river. Sediment rating curve for the potential sites shall be developed and checked against the extracted volumes of sand and gravel.

c) Sand and gravel may be extracted across the entire active channel during the dry season.

d) Abandoned stream channels on terrace and inactive floodplains be preferred rather than active channels and their deltas and flood plains. Stream should not be diverted to form inactive channel.

e) Layers of sand and gravel which could be removed from the river bed shall depend on the width of the river and replenishment rate of the river.

f) Sand and gravel shall not be allowed to be extracted where erosion may occur, such as at the concave bank.

g) Segments of braided river system should be used preferably falling within the lateral migration area of the river regime that enhances the feasibility of sediment replenishment.

h) Sand and gravel shall not be extracted within 200 to 500 meter from any crucial hydraulic structure such as pumping station, water intakes, and bridges. The exact distance should be ascertained by the local authorities based on local situation. The cross-section survey should cover a minimum distance of 1.0 km upstream and 1.0 km downstream of the potential reach for extraction. The sediment sampling should include the bed material and bed material load before, during and after extraction period. Develop a sediment rating curve at the upstream end of the potential reach using the surveyed cross- section. Using the historical or gauged flow rating curve, determine the suitable period of high flow that can replenish the extracted volume. Calculate the extraction volume based on the sediment rating curve and high flow period after determining the allowable mining depth.

i) Sand and gravel could be extracted from the downstream of the sand bar at river bends. Retaining the upstream one to two thirds of the bar and riparian vegetation is accepted as a method to promote channel stability.

j) Flood discharge capacity of the river could be maintained in areas where there are significant flood hazard to existing structures or infrastructure. Sand and gravel mining may be allowed to maintain the natural flow capacity based on surveyed cross- section history.

k) Alternatively, off-channel or floodplain extraction is recommended to allow rivers to replenish the quantity taken out during mining.

l) The Piedmont Zone (Bhabhar area) particularly in the Himalayan foothills, where riverbed material is mined, this sandy-gravelly track constitutes excellent conduits and holds the greater potential for ground water recharge. Mining in such areas should be preferred in locations selected away from the channel bank stretches.

m) Mining depth should be restricted to 3 meter and distance from the bank should be 3 meter or 10 percent of the river width whichever less.

n) The borrow area should preferably be located on the river side of the proposed embankment, because they get silted up in course of time. For low embankment less than 6 m in height, borrow area should not be selected within 25 m from the toe/heel of the embankment. In case of higher embankment the distance should not be less than 50 m. In order to obviate development of flow parallel to embankment, cross bars of width eight times the depth of borrow pits spaced 50 to 60 meters centre-to-centre should be left in the borrow pits.

o) Demarcation of mining area with pillars and geo-referencing should be done prior to start of mining.

THE WORLD SCENARIO

Sand and gravel are mined world-wide and account for the largest volume of solid material extracted globally. Formed by erosive processes over thousands of years, they are now being extracted at a rate far greater than their renewal. Furthermore, the volume being extracted is having a major impact on rivers, deltas and coastal and marine ecosystems, resulting in loss of land through river or coastal erosion, lowering of the water table and decrease in the amount of sediment supply. Despite the colossal quantities of sand and gravel being used, increasing dependence on them and the significant impact that their extraction has on the environment, this issue needs far better attention and awareness.

Globally, between 47 and 59 billion tonnes of material is mined every year of which sand and gravel, known as aggregates, account for both the largest share (from 68% to 85%) and the fastest growth in extraction increase. Although more sand and gravel are mined than any other material, reliable data on their extraction is not available. The absence of global data on aggregates mining makes environmental assessment very difficult and has contributed to the lack of awareness about this issue. One way to estimate the global use of aggregates indirectly is through the production of cement for concrete (concrete is made with cement, water, sand and gravel). The production of cement is reported by 150 countries and it reached 3.7 billion tonnes in 2012 (USGS, 2013a). For each tonne of cement, the building industry needs about six to seven times more tonnes of sand and gravel (USGS, 2013b). Thus, the world's use of aggregates for concrete can be estimated at 25.9 billion tonnes a year for 2012 alone.

Added to this are all the aggregates used in land reclamation, shoreline developments and road embankments (for which the global statistics are unavailable), added to this is the 180 million tonnes of sand used in industry (USGS, 2012). Aggregates also contribute to 90% of asphalt pavements and 80% of concrete roads (Robinson and Brown, 2002). Taking all these estimates into account, a conservative estimate for the world consumption of aggregates exceeds 40 billion tonnes a year.

This large quantity of material cannot be extracted and used without a significant impact on the environment. Extraction has an impact on biodiversity, water turbidity, water table levels and landscape and on climate through carbon dioxide emissions from transportation. There are also socio-economic, cultural and even political consequences. In some extreme cases, the mining of marine aggregates has changed international boundaries, such as through the disappearance of sand islands in Indonesia (New York Times, 2010; Guerin, 2003).

The impacts of sand mining can be mainly categorized as follows:

IMPACTS ON	DESCRIPTION
Biodiversity	Impacts on related ecosystems (for example; fisheries)
Land losses	Both inland and coastal through erosion
Hydrological functions	Change in water flows, flood regulation and marine currents
Water supply	Through lowering of the water table and pollution
Infrastructures	Damage to bridges, river embankments and coastal infrastructures
Climate	Directly through transport emissions
Landscape	Coastal erosion, changes in deltaic structures, quarries, pollution of rivers
Extreme events	Decline of protection against extreme events (flood, drought, storm surge)

World over sand was until recently extracted in land quarries and riverbeds; however, a shift to marine and coastal aggregates mining has occurred due to the decline of inland resources. River and marine aggregates remain the main sources for building and land reclamation. For concrete, in-stream gravel requires less processing and produces high-quality material while marine aggregate needs to be thoroughly washed to remove salt. If the chloride is not removed from marine aggregate, a structure built with it might collapse after few decades due to corrosion of steel reinforced structures. Most sand from deserts cannot be used for concrete and land reclaiming, as the wind erosion process forms round grains that do not bind well.

INDIAN SCENARIO

The data on consumption of sand and aggregate in country is not available with any source. It can be derived indirectly from the usage of cement, construction of roads and stowing of mines. The trend for aggregates extraction can be estimated using cement production as a proxy.

Cement production has multiplied three-fold in the last 20 years from 1.37 billion tonnes of cement in 1994 to 3.7 billion tonnes in 2012 (USGS, 2013a) mainly as a result of rapid economic growth in Asia (UNEP and CSIRO, 2011). Five countries: China (58%), India (6.75%), the United States (2%), Brazil and Turkey - produce 70% of the world's cement (USGS, 2013c). The consumption of cement is expected to reach 324 million tonnes, which equates to use of 2.2 billion tonnes of aggregates. This is in addition to sand and aggregates used in stowing of mines, industry and other allied usage.

In India the main sources of sand are:

(a) River (riverbed and flood plain).

(b) Lakes and reservoirs.

(c) Agricultural fields (Haryana).

(d) Coastal / marine sand.

(e) Palaeo-channels (Bikaner in Rajasthan).

THE PRICE ELASTICITY FOR DEMAND OF SAND

As the price elasticity of demand for sand is inelastic (-0.88), any increase in price in absence of marketable alternative will not have any significant impact on demand. Use of crushed stones or other substitute material should be promoted. The regional context of aggregate resources, market demand, and the environmental impacts of various alternatives must be understood before any site-specific proposal for aggregate extraction can be reviewed.

Evaluation of aggregate supply and demand should be undertaken on the basis of production-consumption regions, encompassing the market for aggregate and all potential sources of aggregate within an economical transport distance. The finite nature of high-quality alluvial gravel resources must be recognized, and high-quality PCC-grade aggregates should be reserved only for the uses demanding this quality material (such as concrete). Alternative sources should be used in less demanding applications (such as road sub-base). Part replacement with fly ash in roads and embankments be promoted in place of sand and aggregates.

The environmental costs of sand mining should be incorporated into the price of the product so that alternative sources that require more processing but have less environmental impact become more attractive.

PROCESS OF SEDIMENT TRANSPORT

The loose boundary (consisting of movable material) of an alluvial channel deforms under the action of flowing water and the deformed bed with its changing roughness (bed forms) interacts with the flow. The resulting movement of the bed material (sediment) in the direction of flow is called sediment transport and a critical bed shear stress must be exceeded to start the particle movement.

Such a critical shear stress is referred as incipient (threshold) motion condition, below which the particles will be at rest and the flow is similar to that on a rigid boundary. Some sediment particles roll or slide along the bed intermittently and some others saltate (hopping or bouncing along the bed). The material transported in one or both of these modes is called 'bed load'.

Finer particles (with low fall velocities) are entrained in suspension by the fluid turbulence and transported along the channel in suspension. This mode of transport is called 'suspended load'. Sometimes finer particles from upland catchment (sizes which are not present in the bed material), called 'wash load', are also transported in suspension. The combined bed material and wash load is called 'total load'.

Bed load ranges from a few percent of total load in lowland rivers to perhaps 15% in Mountain Rivers to over 60% in some arid catchments. Although a relatively small part of the total sediment load, the arrangement of bed load sediment constitutes the architecture of sand, and gravel-bed channels.

The rate of sediment transport typically increases as a power function of flow; that is, a doubling of flow typically produces more than a doubling in sediment transport and most sediment transport occurs during floods. The environmental impacts from in-stream mining can be avoided, if the annual bed load is calculated and aggregate extraction is restricted to that value or some portion of it. To accurately limit extraction to some portion of bed load, the amount of sediment that passes the in-stream mining site during a given period of time must be calculated.

There is a large amount of uncertainty in the process of calculating annual rates of bed load transport. How much coarse material is moved, how long it remains in motion as also how far it moves depends on the size, shape & packing of the material and the characteristics of the river flow.

Downstream movement commonly occurs as irregular bursts of short-distance movement separated by longer periods, when the particles remain at rest. Because bed load changes from hour-to-hour, day-to-day, and year-to-year, estimating annual bed load rates is a dynamic process involving careful examination.

Constant variations in the flow of the river make the channel floor and riverbanks a dynamic interface, where some materials are being eroded while others are being deposited. The net balance of this activity, on a short- term basis, is referred to as scour or fill.

On a long-term basis, continued scour results in erosion (degradation), while continued fill results in deposition (aggradation).

A general indicator of the stability of a stream relates to the amount of vegetation present. Gravel bars that are vegetated or where the gravel is tightly packed, generally indicate streams, where the gravel supply is in balance. Streams with excessive gravel generally have gravel bars with little or no vegetation, and are surfaced with loosely packed gravel.

SUSTAINABLE SAND AND GRAVEL MINING GUIDELINES

The broad principle on which any sustainable sand mining Guidelines / policy can be based is that river/ natural resources must be utilized for the benefit of the present and future generation, so river resources should be prudently managed and developed. The preparation of District Survery Report is an important initial step.

The Processes under the Guidelines:

(a) Identification of areas of aggradation / deposition where mining can be allowed; and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited. Use of satellite imagery for identifying areas of sand deposit and quantity be done.

(b) Calculation of annual rate of replenishment and allowing time for replenishment after mining in area.

(c) Identifying ways of scientific and systematic mining.

(d) Identifying measures for protection of environment and ecology.

(e) Determining measures for protection of bank erosion.

(f) A bench mark (BM) with respect to mean sea level (MSL) should be made essential to in-mining channel reaches (MCR). Below which no mining shall be allowed.

(g) Identifying steps for conservation of mineral.

(h) Permanent gauging facilities (for discharge and sediment both) should be made compulsory for the sites having excessive mining in consultation with Central Water Commission or any competent State Agency.

(i) Implementing safeguards for checking illegal and indiscrete mining.

Following the above processes, to begin with it is important to prepare a survey document mapping the status of sand sources in a district. This survey should be conducted and report be prepared for each district. Though it is an acceptable fact that rivers cut across districts and States and every river is an ecosystem in itself. But, keeping in view the fact that the district is the most established unit of administration at which this kind of survey, planning and monitoring can be ensured effectively, it is proposed that every district will prepare this document taking the river stretch in that district as an ecological unit and inventorising other sources of sand in the district.

Besides, the production of aggregate in a particular area is a function of availability of natural resources, the size of the population, the economy of the area and various developmental and infrastructural works being undertaken in the area.

The natural resources must be utilized in environment friendly manner in scientific and systematic way and with the objective of sustainable development the policy on the subject should have provisions for protection of environment & ecology. These factors can be accounted for in a most efficient manner at district level.

The sustainable mining plan needs to be dynamic. A survey should be carried out by the District Environment Impact Assessment Authority (DEIAA) with the assistance of Geology Department, Irrigation Department, Forest Department, Public Works Department, Ground Water Boards, Remote Sensing Department and Mining Department etc. in the district at regular intervals.

The survey shall contain:

1. District wise detail of river or stream and other sand source.
2. District wise availability of sand or gravel or aggregate resources.
3. District wise detail of existing mining leases of sand and aggregates.

Based on this survey document, the action plan shall divide the river/ stream/ other sources of the District into the following categories:

1. River / Stream beds sections / other sources suitable for extraction of sand and aggregates.
2. River / Stream beds sections / other sources prohibited for extraction of sand and aggregates.

The river/ streams/ other sources of sand and aggregate are studied on following parameters:

a) Geomorphological studies

i) Place of origin
ii) Catchment area.
iii) General profile of river stream.
iv) Annual deposition factor.
v) Replenishment.
vi) Total potential of minor mineral in the river bed.

b) Geological studies

i) Lithology of catchment area.
ii) Tectonics and structural behavior of rocks.

c) Climatic Factors

i) Intensity of rainfall.
ii) Climate Zone.
iii) Temperature variation

The following points to be considered while selecting the river / stream for mining besides the above parameters:

i) A stable river is able to constantly transport the flow of sediments produced by watershed such that it's dimensions (width and depth) pattern and vertical profile are maintained without aggrading (building up) or degrading (scouring down).

ii) The amount of boulders, cobbles, pebbles, and sand deposited in river bed equals to the amount delivered to the river from catchment area and from bank erosion minus amount transported downstream each year.

iii) It is compulsive nature of river to meander in their beds and therefore they will have to be provided with adequate corridor for meandering without hindrance. Any attempt to diminish the width of the corridor (floodway) and curb the freedom to meander would prove counterproductive.

iv) Erosion and deposition is law of nature. The river stream has to complete its geomorphological cycles from youth, mature to old age.

v) River capturing is unavoidable.

vi) Fundamentally the lowest point of any stream is fixed by sea level.

This survey document should be prepared in the district based on direct and indirect benefits of mining and identification of the potential threats to the river / stream beds in the district.

Besides, calculating the carrying capacity of the river / stream beds / other sources to find out maximum quantity available to be allowed for removal each year from the sources, it should also provide various measures to regulate sand and aggregate mining in a systemic way.

It has to provide for environmentally safe depth of mining and safeguards of banks by prescribing safe distance from banks. It is required that there should be a Sub-Divisional Committee which should visit each site and make recommendation. The Committee should comprise of Sub-Divisional Magistrate, Officers from Irrigation department, State Pollution Control Board or Committee, Forest department, Geology or mining officer shall visit each site for which environmental clearance has been applied for and make recommendation on suitability of site for mining or prohibition thereof.

THE STRUCTURE OF DISTRICT SURVEY REPORT

The report can have following structure:

1. Introduction
2. Overview of Mining Activity in the District
3 The List of Mining Leases in the District with location, area and period of validity
4. Details of Royalty or Revenue received in last three years
5. Detail of Production of Sand or Bajari or minor mineral in last three years
6. Process of Deposition of Sediments in the rivers of the District
7. General Profile of the District
8. Land Utilization Pattern in the district: Forest, Agriculture, Horticulture, Mining etc.
9. Physiography of the District
10. Rainfall: month-wise
11. Geology and Mineral Wealth

12. Drainage System with description of main rivers.

Sl.No.	NAME OF RIVER	AREA DRAINED (Sq. Km)	% AREA DRAINED

13. Salient Features of Important Rivers and Streams:

Sl.No.	Name of the River / Stream	Total Length in the District (in Km)	Place of origin	Altitude at Origin

14. Methodology Adopted for Calculating of Mineral Potential

The mineral potential is calculated based on field investigation and geology of the catchment area of the river/ streams. As per the policy of the State and location, depth of minable mineral is defined. The area for removal of mineral in a river or stream can be decided depending on geo-morphology

and other factors, it can be 50% to 60% of the area of a particular river/stream, e.g. in Himachal Pradesh mineral constituents like boulders, river born bajari, sand up to a depth of one meter are considered as resource mineral. Other constituents like clay and silt are excluded as waste while calculating the mineral potential of particular river/ stream.

The specific gravity of each mineral constituent is different. While calculating the mineral potential, the average specific gravity is taken as 2.25. The percent of mineral constituent like boulder, river bajari, sand also varies for different river and streams. While calculating the mineral potential the percentage of each mineral constituent is taken as, Boulders 35-40%, Bajari - 30-35%, Sand 25-30% and 5-10% for silt and clay.

The quantum of deposition varies from stream to stream depending upon factors like catchment lithology, discharge, river profile and geomorphology of the river course. There are certain geomorphological features developed in the river beds such as channel bar, point bar etc. where annual deposition is more even two to three meters.

For illustration one example of Yamuna River in Sirmaour district of Himachal Pradesh is given below:

Portion of the River / Stream Recommended for Mineral Concession	Length of area recommended for mineral concession (in kilometer)	Average width of area recommended for mineral concession (in meters)	Area recommended for mineral concession (in square meter)	Mineable mineral potential (in metric tonne) (60% of total mineral potential)
From Downstream of confluence with Tons River to Behral near Haryana and Uttar Pradesh border	31	478	14818000	16803612

Note: Considering the density of river bed material to be **1.89 g/cm^3**

Present Status of Mining

This gives the detail of mining leases already in operation in this stretch, area and production in last three years from these leases is calculated.

Mineral Potential is calculated in following way:

Mineral Potential

Boulder (MT)	Bajari (MT)	Sand (MT)	Total Mineable Mineral Potential (MT)
5601204	6801462	4400946	16803612

Annual Deposition

336072	408088	264057	1008217

Recommendation:

From the above it is clear that about 16803612 metric tonnes of mineral is available up to depth of one meter in the river bed of Yamuna in Sirmour district.
The annual deposition is 1008217 MT.
The average annual production is 80000 MT.
So, 16723612 MT of mineral can be safely removed.

In similar manner it should be calculated for each river and stream in the district and compiled in following format:

Sl.No.	River/ Stream	Portion of the river / stream recommended for mineral concession	Length of the recommended area for mineral concession (in kilometer)	Average width of the recommended area for mineral concession (in meters)	Area recommended for mineral concession (in sq.mtrs.)	Mineable mineral potential (in metric tonne) (60% of total mineral potential)
Total for the District						

About the size of the mining leases for the aggregates it should be borne in mind that a river / stream can be divided into two zones, which in-turn is dynamic i.e. the zone of erosion and

zone of deposition. These zones of deposition and erosion are extended in different patches in the river.

Any mining lease granted in larger tract can cover both the zones, and mining activity in zone of erosion can further aggravate the problem of erosion and as such the mining activity can be allowed only in the zone of the deposition. The mining leases of larger areas in rivers are neither in interest of environment nor in the interest of mineral conservation.

In Himalayan states the rivers and wasteland has been mostly classed as forest land and mining on that requires diversion of forest land and payment of compensatory afforestation and NPV etc. The land in river beds in hilly tracts and many small rivers at any one site seldom exceed 5 hectare, so not allowing sand mining leases less than 5 hectare on river beds further aggravates the situation. So the size of mining lease for river sand mining should be determined by the State as per the local situation.

MANAGEMENT PLAN

1. River Bed Mining Recommendations:

a) Permit Mining Volume Based on Measured Annual Replenishment

In the first year following adoption of the management plan, a volume equal to the estimated annual replenishment could be extracted from the reach of channel. Replenishment (up to the elevation of the selected channel configuration) would need to occur before subsequent extraction could take place. The concept of annual replenishment accounts for the episodic nature of sediment transport. For example, during wet periods with high stream flows, and a high contribution of sediment from hill slopes and tributaries, monitoring data would show that sand and gravel bars are replenished quickly. During drought periods with low stream flow, and little sediment supply or transport, monitoring data would likely show that bars were replenished at a slower rate.

The use of monitoring data is essential in measuring when actual replenishment occurs. The use of the concept of annual replenishment protects long-term channel stability as well as aquatic and riparian habitat by extracting a volume sustainable by watershed processes.

b) Establish an Absolute Elevation below Which No Extraction May Occur (Minimum Enveloped Level or Redline).

The absolute elevation below which no mining could occur or "redline" would be surveyed on a site-specific basis in order to avoid impacts to structures such as bridges and to avoid vegetation impacts associated with down-cutting due to excessive removal of sediment. An extraction site can be determined after setting the deposition level at 1 m above natural channel thalweg elevation, as determined by the survey approved by mine plan approving authority.

c) Limit River Bed Extraction Methods to Bar Skimming

If mining is limited to the downstream end of the bar with a riparian buffer on both the channel and hill slope (or floodplain) side, bar skimming would minimise impacts. Other methods such as excavation of trenches or pools in the low flow channel lower the local base level, and maximise upstream (head cutting and incision) and downstream (widening and braiding) impacts. In addition, direct disturbance of the substrate in the low flow channel should be avoided. Trenching on bars may be beneficial in the future if the river becomes severely aggraded, flat, shallow and braided. Trenching of bars may initially impact a smaller area of riparian habitat than skimming - as a result of excavating deeper rather than shallow skimming of a large area. However, over the

long-term, the upstream and downstream effects of a trench on the bar or in the channel may offset any short-term benefit derived from this method.

d) Extract Sand and Gravel from the Downstream Portion of the Bar:

Retaining the upstream one to two thirds of the bar and riparian vegetation while excavating from the downstream one to two third of the bar is accepted as a method to promote channel stability and protect the narrow width of the low flow channel necessary for aquatic life. Sand and gravel would be re-deposited in the excavated downstream one to two thirds of the bar (or downstream of the widest point of the bar) where an eddy would form during sediment transporting flows. In contrast, if excavation occurs on the entire bar after removing existing riparian vegetation, there is a greater potential for widening and braiding of the low flow channel.

e) Concentrate Activities to Minimise Disturbance:

River bed extraction activities should be concentrated or localised to a few bars rather than spread out over many bars. This localisation of extraction will minimise the area of disturbance of upstream and downstream effects. Skimming decreases habitat and species diversity - these effects should not be expanded over a large portion of the area.

f) Review Cumulative Effects of Sand and Gravel Extraction:

The cumulative impact of all mining proposals should be reviewed on an annual basis to determine if cumulative riverine effects or effects to the estuary are likely.

g) Maintain Flood Capacity:

Flood capacity in the river should be maintained in areas where there are significant flood hazards to existing structures or infrastructure.

h) Establish a Long-term Monitoring Program:

Monitoring of changes in bed elevation and channel morphology, and aquatic and riparian habitat upstream and downstream of the extraction would identify any impacts of sand and gravel extraction to biologic resources. Long-term data collected over a period of decades as sand and gravel extraction occurs will provide data to use in determining trends.

i) Minimise Activities That Release Fine Sediment to the River:

No washing, crushing, screening, stockpiling, or plant operations should occur at or below the streams "average high water elevation," or the dominant discharge. These and similar activities have the potential to release fine sediments into the stream, providing habitat conditions harmful to local fish.

j) Retain Vegetation Buffer at Edge of Water and Against River Bank:

Riparian vegetation performs several functions essential to the proper maintenance of geomorphic and biological processes in rivers. It shields river banks and bars from erosion. Additionally, riparian vegetation, including roots and downed trees, serves as cover for fish, provides food source, works as a filter against sediment inputs, and aids in nutrient cycling. More broadly, the riparian zone is necessary to the integrity of the ecosystem providing habitat for invertebrates, birds and other wildlife.

k) The River Bed mining should only be allowed during the dry season.

No River bed mining should be permitted during rainy season (see Appendix 9).

l) An Annual Status and Trends Report:

This report should review permitted extraction quantities in light of results of the monitoring program, or as improved estimates of replenishment become available. The report should document changes in bed elevation, channel morphology, and aquatic and riparian habitat. The report should also include a record of extraction volumes permitted, and excavation location. Finally, recommendations for reclamation, if needed should be documented.

2. Off-Channel or Floodplain Extraction Recommendations

a) Floodplain Extraction should be set back from the Main Channel

In a dynamic alluvial system, it is not uncommon for meanders to migrate across a floodplain. In areas where sand and gravel occurs on floodplains or terraces, there is a potential for the river channel to migrate toward the pit. If the river erodes through the area left between the excavated pit and the river, there is a potential for "river capture," a situation where the low flow channel is diverted though the pit. In order to avoid river capture, excavation pits should set back from the river to provide a buffer, and should be designed to withstand the 100-year flood (100-year ARI). Adequate buffer widths and reduced pit slope gradients are preferred over engineered structures which require maintenance in perpetuity. Hydraulic, geomorphic, and geotechnical studies should be conducted prior to design and construction of the pit and bund. In addition to river capture, extraction pits create the possibility of stranding fish.

b) The maximum depth of Floodplain Extraction should remain above the Channel Thalweg

Floodplain pits should not be excavated below the elevation of the thalweg in the adjacent channel. This will minimise the impacts of potential river capture by limiting the potential for head cutting and the potential of the pit to trap sediment. A shallow excavation (above the water table) would provide a depression that would fill with

water part of the year, and develop seasonal wetland habitat. An excavation below the water table would provide deep water habitat.

c) Side Slopes of Floodplain Excavation Should Range from 3:1 to 10:1

Side slopes of a floodplain pit should be graded to a slope that ranges from 3:1 to 10:1. This will allow for a range of vegetation from wetland to upland. Steep side slopes excavated in floodplain pits on other systems have not been successfully reclaimed, since it is difficult for vegetation to become stabilised. Terrace pits should be designed with a large percentage of edge habitat with a low gradient which will naturally sustain vegetation at a variety of water levels.

d) Place Stockpiled Topsoil above the 25-year Return Period or ARI Level

Stockpiled topsoil can introduce a large supply of fines to the river during a flood event and degrade fish habitat. Storage above the 25-year flood (25-year ARI) inundation level is sufficient to minimise this risk.

e) Floodplain Pits Should Be Restored to Wetland Habitat or Reclaimed for Agriculture

The key to successful restoration or reclamation is to conserve or import adequate material to re-fill the pit, while ensuring that pit margins are graded to allow for development of significant wetland and emergent vegetation.

f) Establish a Long-term Monitoring Program

A long-term monitoring program should provide data illustrating any impacts to river stability, groundwater, fisheries, and riparian vegetation. The monitoring program should assess the success of any reclamation or restoration attempted.

g) An Annual Status and Trends Report

The status and trends report described previously should include a section on the hydrologic and biologic components of floodplain pit reclamation.

3. Extraction Methods

The important methods of sand and gravel mining operations are as below:

a) **Bar scalping or skimming** is extraction of sand and gravel from the surface of bars. This method generally requires that surface irregularities be smoothed out and that the extracted material be limited to what could be taken above an imaginary line sloping upwards and away from the water from a specified level above the river's water surface at the time of extraction (typically 0.3 - 0.6 m (1-2 ft). Bar scalping is commonly repeated year after year. To maintain the hydraulic control provided to upstream by the Riffle head, the preferred method of bar scalping is now generally to leave the top one-third (approximately) of the bar undisturbed, mining only from the downstream two-

thirds.

b) Dry-Pit Channel Mining

Dry-pit channel mines are pits excavated within the active channel on dry intermittent or ephemeral stream beds. Dry pits are often left with abrupt upstream margins, from which head cuts are likely to propagate upstream.

c) Wet-Pit Channel Mining

Wet-pit mining involves excavation of a pit in the active channel below the surface water in a perennial stream or below the alluvial groundwater table.

d) Bar Excavation

A pit is excavated at the downstream end of the bar as a source of aggregate and as a site to trap sand and gravel. Upon completion, the pit may be connected to the channel at its downstream end to provide side channel habitat.

e) Channel-wide River bed Mining

In rivers with a highly variable flow regime, sand and gravel are commonly extracted across the entire active channel during the dry season. The bed is evened out and uniformly (or nearly so) lowered.

4. Reclamation Plans

Reclamation plans should include:

a) A baseline survey consisting of existing condition cross-section data: Cross-sections must be surveyed between two documented endpoints set back from the top of bank, and elevations should be referenced to bench mark;

b) The proposed mining cross-section data should be plotted over the baseline data to illustrate the vertical extent of the proposed excavation;

c) The cross-section of the replenished bar should be the same as the baseline data. This illustrates that the bar elevation after the bar is replenished will be the same as the bar before extraction;

d) A planimetric map showing the aerial extent of the excavation and extent of the riparian buffers;

e) A planting plan developed by a plant ecologist familiar with the flora of the river for any areas such as roads that need to be restored;

f) A monitoring plan: The appropriate reclamation plans can turn river-bed and floodplain sand and gravel mining operations into something perceived by the public as desirable.

MARINE SAND MINING AND IMPACT ON MARINE BIODIVERSITY

The mining of marine aggregates is increasing significantly. Marine sand mining has had an impact on seabed flora and fauna. Dredging and extraction of aggregates from the benthic (sea bottom) zone destroys organisms, habitats and ecosystems and deeply affects the composition of biodiversity, usually leading to a net decline in faunal biomass and abundance or a shift in species composition. Aggregate particles that are too fine to be used are rejected by dredging boats, releasing vast dust plumes and changing water turbidity, resulting in major changes to aquatic and riparian habitats over large areas.

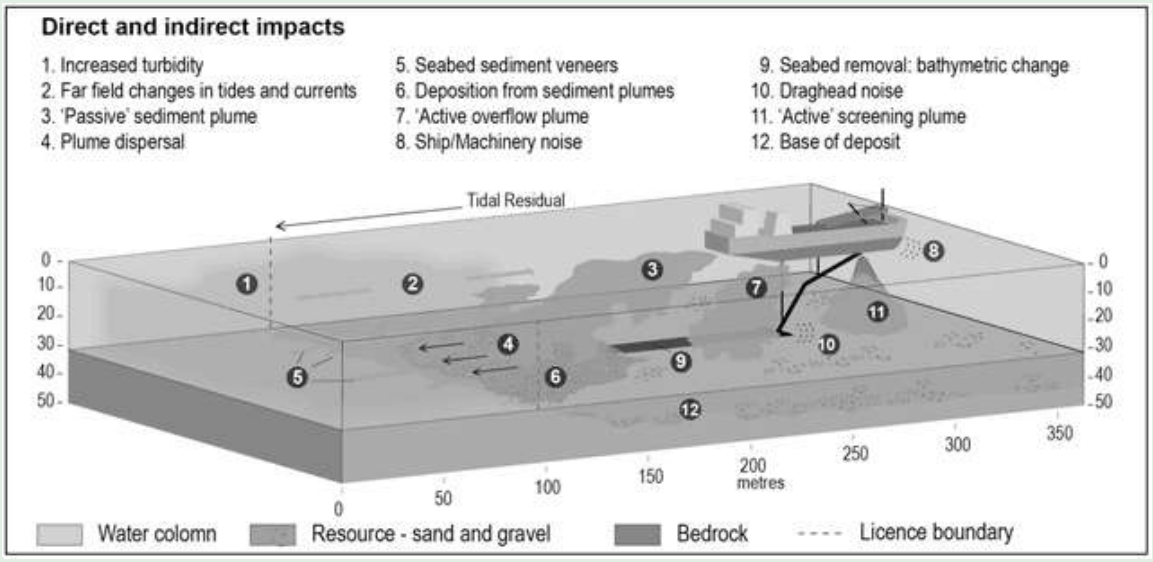

Figure: Direct and indirect consequences of aggregates dredging on the marine environment.

Source: Tillin, H.M., Houghton, A.J., Saunders, J.E., Drabble, R. and Hull, S.C., 2011. Direct and Indirect Impacts of Aggregate Dredging, Marine Aggregate Levy Sustainability Fund (MALSF). Science Monograph Series 1, 1-46.

REDUCING CONSUMPTION OF SAND

Because sand is still very cheap - sand itself is freely accessible; only extraction and transportation costs need to be covered - there is little or no incentive to induce a change in our consumption. Despite the very high value of minerals found in the sand, it is mostly used for concrete or is buried under highways. Recycled building and quarry dust material can be a substitute for sand. Concrete rubble should be recycled to avoid using aggregates, at least for low-quality uses.

Substitutes for sand are available. Quarry dust could be used to replace sand in general concrete structures. The replacement of sand by up to 40% of incinerator ash exhibits higher compressive strength than regular cement mortars. Some desert sand can be used if mixed with other material. There are alternatives for building houses, including wood, straw and recycled material. However, the current building industry is geared toward concrete know-how and equipment.

Training of architects and engineers, new laws and regulations, and positive incentives are needed to initiate a shift for lowering our dependency on sand. Renewable and recycled materials need to be targeted for building houses and roads. Use of Manufactured Sand (M-Sand) also needs to be promoted.

Alternative sources of sand and gravel, which accumulate at the bottom of dams, can also be targeted. Their use would address the problem of these aggregates accumulating which leads to a reduced capacity of dams to store water and could result in the dams' water intakes being blocked. Dams regularly release large amounts of water to flush out aggregates.

The important standard setting bodies in India are taking steps to promote the usage of alternatives to sand and gravel. Bureau of Indian Standards, the National Standards Body of the country, considering the scarcity of sand and coarse aggregates from natural sources, has evolved number of alternatives which are ultimately aimed at conservation of natural resources apart from promoting use of various waste materials without compromising in quality.

These measures include permitting in the Concrete Code (IS 456) as also in the National Building Code of India, the use of slag - a waste from steel industry, fly ash - a waste from thermal power plants, crushed over-burnt bricks and tiles - waste from clay brick and tile industry, in plain cement concrete as an alternative to sand/natural aggregate, subject to fulfilling the requirements of the Code. This Code, further, encourages use of fly ash and ground granulated blast furnace slag as part replacement of ordinary Portland cement in plain as well as reinforced cement concrete.

The Indian Standard on concrete mix design (IS 10262) has been upgraded to include guidance and examples of designing concrete mixes using fly ash and slag. Provisions for compliance for requisite quality of concrete made using fly ash and slag have been duly covered for the manufacturers of ready-mixed concrete in the Indian Standard Code of practice for RMC (IS 4926).

BIS has also formulated an Indian Standard Specification for artificial lightweight aggregates covering manufactured aggregates, such as foamed blast furnace slag, bloated clay aggregate, sintered fly ash aggregate and cinder aggregate (IS 9142).

A series of Indian Standards has also been formulated on various precast concrete products such as solid and hollow concrete blocks, light weight concrete blocks, autoclaved aerated concrete blocks, preformed foam concrete blocks, partial prefabricated concrete flooring and roofing units, concrete pipes, etc, all permitting use of fly ash and slag.

THE REPORT OF THE COMMITTEE HEADED BY SECRETARY, MoEF - 2010

A Committee headed by Secretary, Ministry of Environment and Forest was set up on the subject in 2010. The Committee considered this subject in detail and prepared a report. The important parts of the report are as follows:

Definition of Minor Mineral:

The term 'minor mineral' is defined in clause (e) of Section 3 of MMDR Act, 1957: '3 (e) "minor minerals" means building stones, gravel, ordinary clay, ordinary sand other than sand used for prescribed purposes and any other material which the Central Government may, by Notification in the Gazette of India declare to be a minor mineral;'

The term `ordinary sand' used in clause (e) of Section 3 of the MMDR Act, 1957 has been further clarified in rule 70 of the MCR, 1960 as:

(iv) Purposes of stowing in coal mines,
(v) For manufacture of silvicrete cement,
(vi) Manufacture of sodium silicate and for
(vii) Manufacture of pottery and glass.

Additionally, the Central Government has declared the following minerals as minor minerals:

Sl.No.	Minor Minerals
i)	Boulder
ii)	Shingle
iii)	Chalcedony pebbles used for ball mill purposes only
iv)	Lime shell, kankar and limestone used in kilns for manufacture of lime used as building material
v)	Murrum

Sl.No.	Minor Minerals
vi)	Brick-earth
vii)	Fuller's earth
viii)	Bentonite
ix)	Road metal
x)	Reh-matti

Sl.No.	Minor Minerals
xi)	Slate and shale when used for building material
xii)	Marble
xiii)	Stone used for making household utensils
xiv)	Quartzite and sandstone when used for purposes of building or for making road metal and household utensils
xv)	Saltpetre, and

xvi)	Ordinary earth (Used for filling or leveling purposes in construction or embankments, roads, railways building).

It may thus be observed that minerals have been classified into major and minor minerals based on their end use rather than level of production, level of mechanization, export and import etc. There do exist some minor mineral mines of silica sand and limestone where the scale of mechanization and level of production is much higher than those of industrial mineral mines. Further, in terms of the economic cost and revenue, it has been estimated that the total value of minor minerals constitutes about 10% of the total value of mineral production whereas the value of non- metallic minerals comprises only 3%. It is, therefore, evident that the operations of mines of minor minerals need to be subject to some regulatory parameters as that of mines of major minerals. Further, unlike India there does not exist such system in any other country where minerals are classified as major and minor based on end usage. Thus, there is a need to re-look at the definition of 'minor minerals' per se. It is, therefore, recommended that Ministry of Mines along with Indian Bureau of Mines, in consultation with the State Governments may re-examine the classification of minerals into major and minor categories so that the regulatory aspects and environment mitigation measures are appropriately integrated for ensuring sustainable and scientific mining with least impacts on environment.

Size of the Mine Lease:

Area for grant of mine lease varies from State to State. Maximum area which can be held under one or more mine lease is 2590 ha or 25.90 sq. miles in Jammu and Kashmir. Rajasthan prescribed a minimum limit of 1 ha for a lease. Maximum area prescribed for permit is 50x50 m. In most of the States area of permit is not specified in the rules.

It has recently been observed by Punjab and Haryana High Court in its order dated 15.05.2009 that State Government are apparently granting short term permits by dividing the mining area into small zones in effect to avoids environmental norms. There is, thus a need to bring uniformity in the extent of area to be granted for mine lease so as to ensure that eco- friendly scientific mining practices can be adopted. It is recommended that the minimum size of mine lease should be 5 ha. Further, preparation of comprehensive mine plan for contiguous stretches of mineral deposits by the respective State Governments may also be encouraged. This may suitably be incorporated in the Mineral Concession Rules, 1960 by Ministry of Mines.

Period of Mine Lease:

The period of lease varies from State to State depending on type of concessions, minerals and its end use. The minimum lease period is one year and maximum 30 years. Minerals like granite where huge investments are required, a period of 20 years is generally given with the provisions of renewal. Permits are generally granted for short periods which vary from one month to a maximum one year. In States like Haryana, minor mineral leases are auctioned for a particular time period. Mining is considered to be capital intensive industry and considerable time is lost for developing the mine before it attains the status of fully developed mine. If the tenure of the mine lease is short, it would encourage the lessee to concentrate more on rapid exploitation of mineral without really undertaking adequate measures for reclamation and rehabilitation of mined out area, posing thereby a serious threat to the environment and health of the workers and public at large.

There is thus, a need to bring uniformity in the period of lease. It is recommended that a minimum period of mine lease should be 5 years, so that eco- friendly scientific and sustainable mining practices are adopted. However, under exceptional circumstances arising due to judicial interventions, short term mining leases / contracts could be granted to the State Agencies to meet the situation arising there from.

Cluster of Mine Approach for Small Sized Mines:

Considering the nature of occurrence of minor mineral, economic condition of the lessee and the likely difficulties to be faced by Regulatory Authorities in monitoring the environmental impacts and implementation of necessary mitigation measures, it may be desirable to adopt cluster approach in case of smaller mine leases being operated presently. Further, these clusters need be provided with processing/crusher zones for forward integration and minimizing excessive pressure on road infrastructure. The respective State Governments / Mine Owners Associations may facilitate implementation of Environment Management Plans in such cluster of mines.

Requirement of Mine Plan for Minor Minerals:

At present, most of the State Governments have not made it mandatory for preparation of mining plan in respect of minor minerals. In some States like Rajasthan, eco- friendly mining plans are prepared, which are approved by the State Mining Department. The eco- friendly mining plans so prepared, though conceptually welcome, are observed to be deficient and need to be made comprehensive in a manner as is being done for major minerals. Besides, the aspects of reclamation and rehabilitation of mined out areas, progressive mine closure plan, as in vogue for major minerals could be introduced for minor minerals as well.

It is recommended that provision for preparation and approval of mine plan, as in the case of major minerals may appropriately be provided in the Rules governing the mining of minor minerals by the respective State Governments. These should specifically include the provision for reclamation and rehabilitation of mined out area, progressive mine closure plan and post mine land use.

Creation of Separate Corpus for Reclamation / Rehabilitation of Mines of Minor Minerals:

Mining of minor minerals, in our country, is by and large unorganized sector and is practiced in haphazard and unscientific manner. At times, the size of the leasehold is also too small to address the issue of reclamation and rehabilitation of mined outs areas. It may, therefore, be desirable that before the concept of mine closure plan for minor minerals is adopted, the existing abandoned mines may be reclaimed and rehabilitated with the involvement of the State Government. There is thus, a need to create a separate corpus, which may be utilized for reclamation and rehabilitation of mined out areas. The respective State Governments may work out a suitable mechanism for creation of such corpus on the `polluter pays' principle. An organizational structure may also need to be created for undertaking and monitoring these activities.

Depth of Mining:

Mining of minerals, whether major or minor have a direct bearing on the hydrological regime of the

area. Besides, affecting the availability of water as a resource, it also affects the quality of water through direct run of going into the surface water bodies and infiltration / leaching into groundwater. Further, groundwater withdrawal, dewatering of water from mine pit and diversion of surface water may cause surface and sub- surface hydrologic systems to dry up. An ideal situation would require that quarrying should be restricted to unsaturated zone only above the phreatic water table and should not intersect the groundwater table at any point of time. However, from the point of view of mineral conservation, it may not be desirable to impose blanket ban on mining operation below groundwater table. It is, therefore, recommended that detailed hydro-geological report should be prepared in respect of any mining operation for minor minerals to be undertaken below groundwater table. Based on the findings of the study so undertaken and the comments/ recommendations of Central Ground Water Authority/ State Ground Water Board, a decision regarding restriction on depth of mining for any area should be taken on case to case basis.

Uniform Minor Mineral Concession Rules:

The economic value of the minor minerals excavated in the country is estimated to contribute to about 9% of the total value of the minerals whereas the non- metallic minerals contribute to about 2.8%. Keeping in view the large extent of mining of minor minerals and its significant potential to adversely affect the environment, it is recommended that Model Mineral Concession rules may be framed for minor minerals as well and the minor minerals may be subjected to a simpler regulatory regime, which is, however, similar to major minerals regime.

River Bed Mining:

1. Environment damage being caused by unregulated river bed mining of sand, bajri and boulders is attracting considerable attention including in the courts. The following recommendations are therefore made for the river bed mining.

    (a) In the case of mining leases for riverbed sand mining, specific river stretches should be identified and mining permits/lease should be granted stretch wise, so that the requisite safeguard measures are duly implemented and are effectively monitored by the respective Regulatory Authorities.

    (b) The depth of mining may be restricted to 3m / water level, whichever is less.

    (c) For carrying out mining in proximity to any bridge and / or embankment, appropriate safety zone should be worked out on case to case basis, taking into account the structural parameters, locational aspects, flow rate etc. and no mining should be carried out in the safety zone so worked out.

Conclusion:

Mining of minor minerals, though individually, because of smaller size of mine leases is perceived to have lesser impact as compared to mining of major minerals. However, the activity as a whole is seen to have significant adverse impacts on environment. It is, therefore, necessary that the mining of minor minerals is subjected to simpler but strict regulatory regime and carried out only under an

approved framework of mining plan, which should provide for reclamation and rehabilitation of the mined out areas. Further, while granting mining leases by the respective State Governments "location of any eco-fragile zone (s) within the impact zone of the proposed mining area, the linked Rules/ Notifications governing such zones and the judicial pronouncements, if any, need be duly noted.

The Union Ministry of Mines along with Indian Bureau of Mines and respective State Governments should therefore make necessary provisions in this regard under the Mines and Minerals (Development and Regulation) Act, 1957, Mineral Concession Rules, 1960 and adopt model Guideliness to be followed by all States (emphasis supplied)".

REGIME OF LAW AND ADMINISTRATIVE ORDERS RELATING TO MINING OF MINOR MINERALS

The Entry 54 of List 1 in Schedule VII to the Constitution of India is the entry which empowers the Parliament in respect of 'Regulation of Mines and Minerals Development. Entry 23 of List 2 of the same Schedule, read with Article 246 (3) of the Constitution confers legislative powers on the State Legislature in respect of Regulation of Mines and Mineral Development, but, this power is subject to the provisions of List 1 with respect to the regulation and development under the control of the Union. The Parliament, with the object to amend and consolidate the law relating to the regulation of labour and safety in mines enacted the Mines Act, 1952. Section 2 (JJ) of the Mines Act, 1952 defines "minerals" to mean, all substances which can be obtained from the earth by mining, digging, drilling, dredging, hydraulicing, quarrying or by any other operation and includes mineral oils (which, in turn, include natural gas and petroleum). On 1st June, 1958, the Mines and Minerals (Development and Regulation) Act, 1957 was promulgated. This Act provides, inter alia, for general restrictions on undertaking prospecting and mining operations, the procedure for obtaining prospecting licenses or mining leases in respect of the land in which the minerals vests in the Government, the rule making power for regulating the grant of prospecting licenses and mining leases, special powers of Central Government to undertake prospecting or mining operations in certain cases, and for development of minerals.

The protection of natural environment is one of the fundamental duties of every citizen under Article 51-A of the Constitution of India. Article 48-A of the Constitution, obliged the State to endeavor to protect and improve the environment and to safeguard the forests and wild life of the country. The Environment (Protection) Act and Rules, 1986 were enacted and came into force on 19th November, 1986. The object of this Act is to provide for the protection and improvement of environment and for matters connected therewith. Under provisions of the Act and Rules of 1986, MoEFCC has issued various Notifications regulating the mining of minor minerals, specifically stating the procedures that were required to be complied by persons intending to carry on such mining activity and for the authorities to regulate the same.

Prior to 1994, there was no specific regime in place in relation to mining activity being carried out. The Notification issued by MoEF on 27th January, 1994, in exercise of the powers vested in it under Sub-Rule 3 of Rule 5 of the Rules of 1986 and Sub Section (1) and Clause (v) of Sub-Section (2) of Section 3 of the Act of 1986, prescribed the requirement and procedure for seeking Environmental Clearance for the projects listed in Schedule I. Schedule I of this Notification did not list mining projects of minor minerals. On the contrary, the projects covered under S. No. 20 of Schedule I of this Notification were only "mining projects (major mineral) with leases more than 5 hectares".

It provided for the constitution of Expert Committees and preparation of Environmental Impact Assessment Report which was to be evaluated and assessed by the Impact Assessment Agency. In exercise of its statutory powers afore-indicated, the Central Government on 14th September, 2006,

issued a Notification, i.e., 'Environment Impact Assessment Notification, 2006'. In terms of this Notification, the projects as stated in the Schedule to this Notification required prior Environmental Clearance as per the procedure. The projects have been categorised into two kinds, i.e., Category 'A' and Category 'B' under Clause 2 of the Notification. Projects under Category 'A' were required to take prior Environmental Clearance by MoEFCC. For Category 'B' projects, Environmental Clearance was to be given by State Environment Impact Assessment Authority (SEIAA).

The mining of minerals (both major and minor) were brought under the ambit of the EIA Notification, 2006. The mine lease area of more than equal to 50 ha was Category 'A' and mine lease area less than 50 ha and more than equal to 5 ha was category 'B' project. Mine lease area of less than 5 ha (both major and minor) was kept out of EIA Notification purview.

The Notification of 2006 came to be amended by Notification dated 1st December, 2009. It included the category of non-coal mine and coal mine lease and provided that non-coal mine lease of area more than equal to 5 ha and less than 50 ha will be category 'B' and mine lease area more than equal to 50 ha will be category 'A'. Similarly, mine lease area of more than equal to 5 ha and less than 150 ha for coal mine lease will be category 'B' and mine lease area of coal mine more than 150 ha will be category 'A'. Here again mining lease area of less than 5 ha (both coal and non-coal mine) was kept out of EIA Notification purview.

The Hon'ble Supreme Court, vide its order dated 27.2.2012 in I.A. No.12-13 of 2011 in SLP (C) No.19628-19629 of 2009 titled Deepak Kumar etc. v/s State of Haryana & Ors. has inter alia ordered *"We, in the meanwhile, order 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."*

Hon'ble Apex Court in Deepak Kumar's case (supra) extensively examined the environmental concerns, in the context of mining of minor minerals, considering its impact on the environment. The Apex Court observed that Extraction of alluvial material from within or near a streambed has a direct impact on the stream's physical habitat characteristics. These characteristics include bed elevation, substrate composition and stability, in-stream roughness elements, depth, velocity, turbidity, sediment transport, stream discharge and temperature. Altering these habitat characteristics can have deleterious impacts on both in-stream biota and the associated riparian habitat. The demand for sand continues to increase day by day as building and construction of new infrastructures and expansion of existing ones is continuous thereby placing immense pressure on the supply of the sand resource and hence mining activities are going on legally and illegally without any restrictions. Lack of proper planning and sand management cause disturbance of marine ecosystem and also upset the ability of natural marine processes to replenish the sand. Quarrying, mining and removal of sand from in-stream and upstream of several rivers, which may have serious environmental impact on ephemeral, seasonal and perennial rivers and river beds and sand extraction may have an adverse effect on bio-diversity as well. Further it may also lead to bed degradation and sedimentation having a negative effect on the aquatic life.

Apex Court observed that without conducting any study on the possible environmental impact on/

in the river beds and else- where the auction notices have been issued. Hon'ble Apex Court observed that "We are of the considered view that when we are faced with a situation where extraction of alluvial material within or near a river bed has an impact on the rivers physical habitat characteristics, like river stability, flood risk, environmental degradation, loss of habitat, decline in biodiversity, it is not an answer to say that the extraction is in blocks of less than 5 hectares, separated by 1 kilo meter, because their collective impact may be significant, hence the necessity of a proper environmental assessment plan".

In order to ensure compliance of the aforesaid order of the Hon'ble Supreme Court, MoEF issued an OM No.L-11011/47/2011-IA.II(M) dated 18.05.2012 stating inter alia that all mining projects of minor minerals including their renewal, irrespective of the size of the lease would henceforth require prior EC and that the projects of minor minerals with lease area less than 5 ha would be treated as Category "B" as defined in EIA Notification, 2006 and will be considered by the respective State Environment Impact Assessment Authorities (SEIAAs) notified by MoEF and following the procedure prescribed under the EIA Notification, 2006.

On 24th June, 2013, MoEF issued another Office Memorandum stating Guideliness for consideration of proposals for grant of Environmental Clearance under the Notification of 2006 for mining of 'brick earth' and 'ordinary earth' having lease area of less than 5 hectares. Referring to the judgment of the Hon'ble Supreme Court in the case of Deepak Kumar (supra) and its Office Memorandum dated 18th May, 2012, it further considered that the 'brick kiln' manufactures had stated that it was a small scale activity requiring that certain depth should be kept outside the purview of Environmental Clearance. Having considered various aspects, examining the recommendations of the Expert Committee, constituted by MoEF, finally it was directed as follows:

"(a) The activities of borrowing / excavation of 'brick earth' and ordinary earth', upto an area of less than 5 ha, may be categorized under 'B2' Category subject to the following Guideliness in terms of the provisions under '7.I Stage(1)-Screening' of EIA Notification, 2006:

(i) The activity associated with borrowing/excavation of 'brick earth' and 'ordinary earth' for purpose of brick manufacturing, construction of roads, embankments etc. shall not involve blasting.

(ii) The borrowing/excavation activity shall be restricted to a maximum depth of 2 m below general ground level at the site.

(iii) The borrowing/excavation activity shall be restricted to 2 m above the ground water table at the site.

(iv) The borrowing/excavation activity shall not alter the natural drainage pattern of the area.

(v) The borrowed/excavated pit shall be restored by the project proponent for useful purpose(s).

(vi) Appropriate fencing all around the borrowed/excavated pit shall be made to prevent any mishap.

(vii) Measures shall be taken to prevent dust emission by covering of borrowed/excavated earth during transportation.

(viii) Safeguards shall be adopted against health risks on account of breeding of vectors in the water bodies created due to borrowing/excavation of earth.

(ix) Workers / labourers shall be provided with facilities for drinking water and sanitation.

(x) A berm shall be left from the boundary of adjoining field having a width equal to at least half the depth of proposed excavation.

(xi) A minimum distance of 15 m from any civil structure shall be kept from the periphery of any excavation area.

2. (a) The concerned SEIAA while considering granting environmental clearance for such activity for brick earth / ordinary earth will prescribe the Guideliness as stated at (i) to (xi) above and specify that the clearance so granted shall be liable to be cancelled in case of any violation of above Guideliness.

(b) Notwithstanding what has been stated at (a) above, the following will apply:

(i) No borrowing of earth / excavation of 'brick earth' or 'ordinary earth' shall be permitted in case the area of borrowing/ excavation is within 1 km of boundary of national parks and wild life sanctuaries.

(ii) In case the area of borrowing / excavation is likely to result into a cluster situation i.e. if the periphery of one borrow area is less than 500 m from the periphery of another borrow area and the total borrow area equals or exceeds 5 ha, the activity shall become Category 'B 1' Project under the EIA Notification, 2006. In such a case, mining operations in any of the borrow areas in the cluster will be allowed only if the environmental clearance has been obtained in respect of the cluster. This issues with the approval of the Competent Authority."

These directions which were specific only to 'brick earth' and 'ordinary earth' activities for areas less than 5 hectares, as decided to be categorised as 'B 2' Category projects, subject to the restrictions stated in the memorandum, provided that if the cluster area exceeded 5 hectares, then it would become Category 'B 1' and would not be treated as Category 'B 2' projects. The above Office Memorandum was not dealing with the issues of sand mining or any other minor mineral activity except 'brick earth' and 'ordinary earth'. Further, MoEF has issued an amendment to EIA Notification vide Notification S.O. 2731 (E) dated 9th September 2013 and amended the EIA Notification, 2006 for item 1 (a) as follows:

(1)	(2)	(3)	(4)	(5)
"1(a)	(i) Mining of minerals.	≥ 50 ha of mining lease area in respect of non-coal mine lease	<50 ha of mining lease area in respect of minor minerals mine lease ; and < 50 ha ≥5 ha of mining lease area in respect of other non-coal mine lease.	General Conditions shall apply except for project or activity of less than 5 ha of mining lease area for minor minerals: Provided that the above exception shall not apply for project or activity if the sum total of the mining lease area of the said project or activity and that of existing operating mines and mining projects which were accorded environment clearance and are located within 500 metres from the periphery of such project or activity equals or exceeds 5 ha.
		>150 ha of mining lease area in respect of coal mine lease.	≤ 150 ha ≥ 5 ha of mining lease area in respect of coal mine lease.	(i) Prior environmental clearance is required at the stage of renewal of mine lease for which an application shall be made up to two years prior to the date due for renewal. Further, a period of two years with effect from the 4th April, 2011 is provided for obtaining environmental clearance for all those mine leases, which were operating as

(1)	(2)	(3)	(4)	(5)
				on the 4th April, 2011 with requisite valid environmental clearance and which have fallen due for renewal on or after the 4th November, 2011: Provided that no fresh environmental clearance shall be required for a mining project or activity at the time of renewal of mining lease, which has already obtained environmental clearance under this notification.
	(ii) Slurry pipelines (coal lignite and other ores) passing through national parks or sanctuaries or coral reefs, ecologically sensitive areas.	All projects.		(ii) Mineral prospecting is exempted.

In this Notification a new category of minor mineral was introduced and it was provided that mining lease area of minor mineral less than 50 ha will be category 'B' and will require EC. Accordingly the minor mineral mining projects having less than 5 hectare of lease area are required to be appraised by the SEIAA/SEAC of respective State for granting environment clearance. It was provided that the project or activity of less than 5 ha of mining lease area for minor minerals will be exempt from the General Conditions. Simultaneously the concept of cluster was introduced and it was provided that the exemption of applicability of General Conditions shall not apply for project or activity if the sum total of the mining lease area of the said project or activity and that of existing operating mines and mining projects which were accorded EC and are located within 500 m from the periphery of such project or activity equal or exceeds 5 ha.

The Ministry, on 24th December, 2013, issued another Office Memorandum for consideration of proposals for grant of Environmental Clearance regarding categorisation of Category 'B' projects into Category 'B (1)' and 'B (2)'. Mining of minor minerals had been separately dealt with in this Office Memorandum. This Office Memorandum stated that no river sand mining project with mining lease area of less than 5 hectares may be considered for grant of Environmental Clearance. Such area up to 25 hectares would be categorised as 'B (2)' and such projects were to be considered, subject to the stipulations stated therein. This Office Memorandum stated that no Environmental Clearance would be granted for extraction of minor minerals from any riverbed where the area is less than 5 hectares. Sand mining, in area other than riverbeds, would be permitted, only if the Project Proponent takes Environmental Clearance.

The Ministry vide Notification No. S.O. 1599 (E) dated 25.06.2014 reduced the area of 10 kilo meter to 5 kilo meters for applicability of General Conditions increasing the delegation to States by taking out projects located in 5 to 10 kilo meter of interstate boundary, CEPI, and, PAs from category 'A'.

The anomaly created by the Notification dated 09.09.2013 was corrected vide Notification No. S.O. 2601 (E) dated 7th October 2014, and category of minor mineral was deleted and mining leases were again classed as non-coal mine and coal mine and mining lease area of less than 50 ha was made category 'B' for non-coal mine and mine lease area of less than equal to 150 ha for coal mine was made category 'B'. The mine lease area of less than 5 ha was exempt from the applicability of General Conditions and cluster concept of Notification dated 09.09.2013 was retained.

Notification S.O. 2601 (E) dated 7th October 2014 provides as follows:

(1)	(2)	(3)	(4)	(5)
"1(a)	(i) Mining of minerals.	≥ 50 ha of mining lease area in respect of non-coal mine lease. >150 ha of mining lease area in respect of coal mine lease. Asbestos mining irrespective of mining area.	<50 ha of mining lease area in respect of non-coal mine lease. ≤ 150 ha of mining lease area in respect of coal mine lease.	General Conditions shall apply except for project or activity of less than 5 ha of mining lease area: Provided that the above exception shall not apply for project or activity if the sum total of the mining lease area of the said project or activity and that of existing operating mines and mining projects which were accorded environment clearance and are located within 500 metres from the periphery of such project or activity equals or exceeds 5 ha. Note: (i) Prior environmental clearance is required at the stage of renewal of mine lease for which an application shall be made up to two years prior to the date due for renewal. Provided that no fresh environmental clearance shall be required for a mining project or activity at the time of renewal of mining lease, which has already obtained environmental clearance under this notification. (ii) Mineral prospecting is exempted. "
	(ii) Slurry pipelines (coal lignite and other ores) passing through national parks or sanctuaries or coral reefs, ecologically sensitive areas	All projects.		

The NGT vide order dated 13.01.2015 (O.A. No. 123 of 2014 and M.A. No. 419 of 2014) has declared the Notification dated 09.09.2013 as invalid, inoperative and quashed it. The above order has also quashed the paragraph 4 (b) (i) of O.M. dated 24th June 2013 which provided that "No borrowing of earth / excavation of 'brick earth' or 'ordinary earth' shall be permitted in case the area of borrowing / excavation is within 1 km of boundary of national parks and wild life sanctuary." Though this provision was taken from the observation of Hon'ble Supreme Court in W.P. No. 435 of 2012 (Goa Foundation Vs. Union of India) and order dated 04.08.2006 of Supreme Court in *T.N. Godavarman Thirumulpad v. Union of India & Ors.* Supreme Court has taken a view that 1 km. from the boundaries of National Parks and Sanctuaries would be a safety zone, subject to the orders that may be made in IA No.1000 regarding Jamua Ramgarh Sanctuary and the State will not grant any Temporary Working Permit (TWP) in these safety zones comprising 1 km. from the boundaries of National Parks and Sanctuaries.

Similarly the proviso at paragraph 2 (iii) of O.M. dated 24.12.2013 which says that "No river sand mining project, with mine lease area less than 5 ha, may be considered for granting EC" has been quashed. This condition was taken from the recommendations of the Committee headed by the Secretary, MoEF constituted in 2010. The above proviso were quashed on the ground that as EIA Notification places no such restriction, so same cannot be imposed by an executive order and many hill States find it very difficult to get an area equal to or more than 5 ha. in riverbed. The information made available by the States also makes it clear that majority of the mining leases of sand are of area less than 5 hectares.

THE ISSUES AND MANAGEMENT OF MINING IN CLUSTER

In I.A. No. 12-13 of 2011 in SLP Nos. 729-731 / 2011, 21833 / 2009, 12498-499 / 2010, SLP (C) CC … 16157 / 2011 & CC 18235 / 2011 (Deepak Kumar and Ors. Vs. State of Haryana and Ors. etc.) Hon'ble Supreme Court in its order dated 27.02.2012 on the subject of cluster has quoted the submission of affidavit dated 23.11.2011 of MOEFCC. It says that "The Ministry is of the opinion that where the mining area is homogeneous, physically proximate and on identifiable piece of land of 5 ha. or more, it should not be broken into smaller sizes to circumvent the EIA Notification, 2006 as the EIA Notification, 2006 is not applicable to the mining projects having lease area of less than 5 ha. The Report of Committee on Minor Minerals, under the Chairmanship of Secretary (E&F) with representatives of various state governments as members including the State of Haryana and Rajasthan recommended a minimum lease size of 5 ha for minor minerals for undertaking scientific mining for the purpose of integrating and addressing environmental concerns. Only in cases of isolated discontinued mineral deposits in less than 5 ha, such mining leases may be considered keeping in view the mineral conservation".

The order further quotes that "Cluster of Mine Approach for Small Sized Mines: Considering the nature of occurrence of minor mineral, economic condition of the lessee and the likely difficulties to be faced by Regulatory Authorities in monitoring the environmental impacts and implementation of necessary mitigation measures, it may be desirable to adopt cluster approach in case of smaller mine leases being operated presently. Further these clusters need be provided with processing / crusher zones for forward integration and minimizing excessive pressure on road infrastructure. The respective State Governments / Mine Owners Association may facilitate implementation of Environment Management Plans in such cluster of mines." The order has further quoted the letter dated 1.06.2010 written by the then Minister of Environment, Forest and Climate Change which says on the subject that "A cluster approach to mines should be taken in case of smaller mines leases operating currently". The Hon'ble Court has ordered that "The State of Haryana and various other States have not so far implemented the above recommendations of the MoEF or the Guideliness issued by the Ministry of Mines before issuing auction notices granting short term permits by way of auction of minor mineral boulders gravel, sand etc., in the river beds and elsewhere of less than 5 hectares. We therefore, direct to all the States, Union Territories, MoEF and the Ministry of Mines to give effect to the recommendations made by MoEF in its report of March 2010 and the model Guideliness framed by the Ministry of Mines, within a period of six months from today and submit their compliance reports."

"We in the meanwhile, order 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."

The Ministry vide O.M. No. L-11011/47/2011-IA.II (M) dated 18th May 2012 said that "In order to ensure compliance of the above referred order of the Hon'ble Supreme Court dated 27.02.2012, it has now been decided that all mining projects of minor minerals including their renewal, irrespective of the size of the lease would henceforth require prior environment clearance. Mining projects with lease area up to less than 50 ha including projects of minor mineral with lease area less than 5 ha would be treated as Category 'B' as defined in EIA Notification, 2006 and will be considered by the respective SEIAAs notified by MoEF and following the procedure prescribed under EIA Notification, 2006."

On the issue of cluster, the Notifications No. S.O. 2731 (E) dated 09.09.2013 and Notification No. S.O. No. 2601 (E) of 07.10.2014 were issued.

The above Notifications in Schedule at Item No. 1 (a) in Conditions mentions that "General Conditions shall apply except for projects or activity of less than 5 ha of mining lease area:

Provided that the above exception shall not apply for project or activity if the sum total of the mining lease area of the said project or activity and that of existing operating mines and mining projects which were accorded environment clearance and are located within 500 meters from the periphery of such projects or activity equals or exceeds 5 ha. The Office Memorandum No. J-13012/12/2013-IA-II (1) dated 24.12.2013 is about Guideliness for consideration of proposals for grant of environment clearance under Environment Impact Assessment Notification 2006 and its amendments - regarding categorization of Category 'B' projects/ activities into Category 'B1' & 'B2'.

The above O.M. besides categorizing the Category B into Category B1 & B2 also has directions on mining of brick earth / ordinary earth and river sand mining. These provisions are as follows:

"Mining of minor minerals:

As of now, mining projects of minor minerals with less than 50 hectare of mining lease areas are categorized as Category 'B' as per Notification S.O. 2731 (E) dated 9th September 2013. Also vide O.M. No. L-11011/47/2011-IA-II (M) dated 24.06.2013, Guideliness has been issued regarding categorization of mining projects of brick earth and ordinary earth having lease areas less than 5 hectare as Category 'B2' subject to stipulations stated therein.

In the above backdrop, the projects of mining of minor minerals, categorized as Category 'B' are hereby categorized as 'B2' as per the following:

(i) 'Brick Earth' / 'Ordinary Earth' mining projects having lease area less than 5 ha will be considered for granting EC as per the aforesaid Guideliness issued by MOEF on 24.06.2013.

(ii) 'Brick Earth' / 'Ordinary Earth' mining projects with mining lease area more than equal to 5 ha but less than equal to 25 ha and all other minor , mineral mining projects with mining lease area < 25 ha, except for river sand mining projects will be appraised as Category 'B2' projects.

These projects will be appraised based on the following documents:

(a) Form-1 as per the Appendix-I under the EIA Notification 2006

(b) Pre-feasibility report of the project

(c) Mining plan approved by the authorized agency of the concerned State Government.

Provided in case the mining lease area is likely to result into a cluster situation, i.e. if the periphery of one lease area is less than 500 meter from the periphery of another lease area and the total lease area equals or exceeds 25 ha, the activity shall become Category 'B1' Project under the EIA

Notification, 2006. In such a case, mining operations in any of the mine lease areas in the cluster will be allowed only if the environmental clearance has been obtained in respect of the cluster.

About river sand mining it says that:

(iii) No river sand mining project, with mine lease area less than 5 ha, may be considered for granting EC. The river sand mining projects with lease area more than equal to 5 ha but less than 25 ha will be categorized as 'B2'. In addition to the requirement of documents, as brought out above under sub-para (ii) above for appraisal, such projects will be considered subject to the following stipulations:

(a) The mining activity shall be done manually. The depth of mining shall be restricted to 3 m / water level, whichever is less.

(b) For carrying out mining in proximity to any bridge and / or embankment, appropriate safety zone shall be worked out on case to case basis to the satisfaction of SEAC / SEIAA, taking into account the structural parameters, locational aspects, flow rate etc., and no mining shall be carried out in the safety zone so worked out. No in-stream mining shall be allowed.

(c) The mining plan approved by the authorized agency of the State Government shall inter-alia include study to show that the annual replenishment of sand in the mining lease area is sufficient to sustain mining operations at levels prescribed in the mining plan and that the transport infrastructure is adequate to transport the mines material. In case of transportation by road the transport vehicles will be covered with the tarpaulin to minimize dust/ sand particle emissions.

(d) EC will be valid for mine lease period subject to a ceiling of 5 years.

Provided, in case the mining lease area is likely to result into a cluster situation i.e. if the periphery of one lease area is less than 1 km from the periphery of another lease area and total lease area equals to or exceeds 25 ha., the activity shall become Category 'B1' Projects under EIA Notification, 2006. In such a case, mining operation in any of the mine lease area in the cluster will be allowed only if the environment clearance has been obtained in respect of the cluster.

The NGT order dated 13.01.2015 in O.A. No. 123 of 2014 and M.A. No. 419 of 2014 has following directions on the issue of cluster: "In light of the judgment of the Supreme Court and what has emerged from the various cases that are subject matter of this Judgment, we direct the Ministry of Environment and Forest to formulate a uniform cluster policy in consultation with the States for permitting minor mineral mining activity including its regulatory regime, in accordance with law.

Notification S.O. 1559 (E) dated 25th June 2014 provides that "Any project or activity specified in Category 'B' will be appraised at the Central Level as Category 'A', if located in whole or in part within 5 km. from the boundary of: (i) Protected Areas; (ii) CEPI; (iii) ESA; (iv) Inter-state boundaries or international boundaries ……".

The NGT vide its order dated 13.01.2015 has quashed the Notification dated 9th September 2013, but similar provision on clusters exists in Notification dated 7th October 2014.

The EIA Notification 2006, as amended makes it clear that projects in respect of non-coal mine leases, where the area is more than equal to 50 hectares would require prior Environmental Clearance from MoEFCC, while the projects of area less than 50 hectares would be appraised for prior Environmental Clearance at the level of SEIAA.

The EIA Notification of 2006 in Clause 7 specifies the stages through which projects for grant of Environmental Clearance are required to be passed and processed. The stages include Screening, Scoping, Public Consultation and Appraisal, upon which, the Expert Appraisal Committee makes recommendation to the MoEF/SEIAA. Under 'Screening', this Clause 7 also provides for a further bifurcation of projects falling under category 'B' into 'B 1' and 'B 2'. The relevant part of Clause 7, dealing with this aspect, reads as under: "Stage (1) - Screening (Only for Category 'B' projects and activities): In case of Category 'B' projects or activities, this stage will entail the scrutiny of an application seeking prior environmental clearance made in Form 1 by the concerned State level Expert Appraisal Committee (SEAC) for determining whether or not the project or activity requires further environmental studies for preparation of an Environmental Impact Assessment (EIA) for its appraisal prior to the grant of environmental clearance depending up on the nature and location specificity of the project . The projects requiring an Environmental Impact Assessment report shall be termed Category 'B1' and remaining projects shall be termed Category 'B2' and will not require an Environment Impact Assessment report. For categorization of projects into B1 or B2 except item 8 (b), the Ministry of Environment and Forests shall issue appropriate Guideliness from time to time."

The Ministry on 24th December, 2013, issued Office Memorandum for consideration of proposals for grant of Environmental Clearance regarding categorisation of Category 'B' projects into Category 'B1' and 'B2'. Mining of minor minerals had been separately dealt with in this Office Memorandum. Such area up to 25 hectares would be categorised as 'B 2' and such projects were to be considered, subject to the stipulations stated therein.

The EIA Notification, 2006 does not provide for issuance of Environment Clearance to Cluster of mines. It provides for EC to individual lease holders / project proponents. This position has also been upheld by the Hon'ble Supreme Court in its judgment of Vivek Bansal Vs. State of Haryana that EC should be applied for and granted to the individual lease holder.

There has been rising concerns about adverse impact of mining on small leases (less than 5 hectare) in case the numbers of such leases are large and they are located in close proximity to each other. This leads to the definition of Cluster. To avoid the rigors of environment impact assessment studies, environment management plan and the environment clearance there has been a tendency to break the leases into size which does not attract the provisions of environment impact assessment studies, environment management plan, public consultation and the environment clearance. In Deepak Kumar's case Hon'ble Supreme Court also encountered this situation and in its order dated 27.02.2012 mandated that no mining lease or renewal be done without environment clearance irrespective of size.

It is seen that the categorization of mines into 'B1' and 'B2' category in which Category 'B2' leases are being exempted from the requirement of Environment Impact Assessment, Environment Management Plan, and Public Consultation for grant of EC, in many cases now the mining leases are being given for 25 hectares or less. This defeats the purpose and intent of Hon'ble Supreme Court Judgment which orders environment clearance for all mining leases irrespective of size. The environment clearance without Environment Impact Assessment, Environment Management Plan, and Public Consultation does not serve the purpose of environment clearance which is to ensure environmentally sustainable and socially responsible mining. So if a cluster or individual lease size exceeds 5 hectare, the EIA/ EMP should be completed in the process of grant of prior environment clearance.

The EIA Notification, 2006 and subsequent amendments to that or any O.M. issued by the Ministry do not provide for procedures and Competent Authority for environment clearance for cluster. In a cluster there will mostly be situation where there are a number of different lease holders and as per the settled law the lease holder has to do the working of mine and the lease holder is the one who can apply for and get the environment clearance. The conditions stipulated in the environment clearance have to be complied by the EC holder and any violation of that empowers the authority to cancel the environment clearance or prosecute the EC holder if necessitated by the circumstances.

For cluster there is no mechanism about who will apply for EC, EC will be issued in whose name, and who will be responsible for compliance of EC conditions.

The intent of cluster assessment is to have a holistic knowledge of the impact on environment by different mines operating in close proximity of each other. There are also requirement of mitigative measures which need implementation in concerted manner by different EC holders of that cluster. To ensure that it is important that there should be an integrated Environment Impact Assessment /

Environment Management Plan for the cluster to be presented before the authority appraising the projects and considering the proposals for grant of EC. This integrated EIA/ EMP can be prepared by either the lease holder, group of lease holders, State or the State Agencies. This EIA/ EMP need to be prepared by the accredited consultants / Registered Qualified Persons of the State Governments. The application for EC and grant of EC should be done in the name of individual lease holders in the background of the integrated EIA/EMP report. The Competent Authority (SEIAA/ SEAC / EAC) will entertain individual lease holder's application for grant of EC to individual mining lease projects in that cluster in the name of lease holders. The conditions related to mitigative measures necessitated by the integrated EIA/EMP may run across more than one lease holder or EC holders, that should figure in each EC accordingly and its compliance be ensured by the individual EC holders.

The Hon'ble Supreme Court, NGT, SEAC/EAC and the Project Proponents have raised issue of cluster in mine lease allotment and environment clearance for the same, so following conditions need to be ensured for cluster of mines:

1. To address the concern of adverse impact of minor mineral mining on environment it is proposed that all mining activity including river sand mining (above 5 hectare individual or cluster) will need to prepare Environment Impact Assessment Report and Environment Management Plan before grant of environment clearance. These reports (EIA /EMP) can be prepared by the State or State nominated Agency / the Project Proponent (s).
2. As can be seen from the data provided by the States most of the mining leases for minor minerals are of lease area less than 5 hectare. It is also reported that in hill states getting a stretch in river with area more than 5 hectare is very uncommon. So the size of lease for minor minerals including river sand mining will be determined by the States as per their circumstances.
3. The EIA Notification, 2006 does not provide for cluster EC, it provides for issuance of EC to individual project proponents and the same has also been upheld in the judgment of Hon'ble Supreme Court in Vijay Bansal vs. State of Haryana case. So EC will have to be applied for and issued to the individual project proponent.
4. A cluster shall be formed when the distance between the peripheries of one lease is less than 500 meters from the periphery of other lease in a homogeneous mineral area.
5. The mining of minor minerals is mostly in clusters. The Environment Impact Assessment or Environment Management Plan are required to be prepared for the entire cluster in order to capture all the possible externalities. These reports shall capture carrying capacity of the cluster, transportation and related issues, replenishment and recharge issues, geo-hydrological study of the cluster area. The Environment Impact Assessment or Environment Management Plan shall be prepared by the State or State nominated Agency or group of project proponents

in the Cluster or the project proponent in the cluster.

6. The individual lease holders in cluster can use the same Environment Impact Assessment or Environment Management Plan for application for environmental clearance. The cluster Environment Impact Assessment or Environment Management Plan shall be updated as per need keeping in view any significant change.

7. There shall be one public consultation for entire cluster after which the final Environment Impact Assessment or Environment Management Plan report for the cluster shall be prepared.

8. The details of cluster Environment Impact Assessment or Environment Management Plan shall be reflected in each environmental clearance in that cluster and District Expert Appraisal Committee (DEAC), SEAC, and EAC shall ensure that the mitigative measures emanating from the Environment Impact Assessment or Environment Management Plan study are fully reflected as environmental clearance conditions in the environmental clearance's of individual project proponents in that cluster.

9. As the sand is mostly mined from rivers and majority of the rivers which are important source of sand also form boundary between States, so because of General Conditions most of the sand mining projects become Category 'A' project. So the General Conditions will not apply in case of river sand and gravel mining projects on account of being in 5 kilometer of inter-state boundary.

10. The Committee headed by the District Magistrate or District Collector will be empowered to appraise and grant EC for mining leases up to 5 ha in case of individual lease and up to 25ha in case of cluster for sand mining.

11. In case the mining leases are in cluster (if periphery of one lease is within 500 meters), fowling are the categorization of projects:-

- Category 'B2'Project: Cluster area of mine leases up to 5 ha and to be dealt at DEIAA/ DEAC level
- Category 'B2'Project: Cluster area of Mine leases > 5 ha and < 25 ha with no individual lease > 5 ha and to be dealt at DEIAA/DEAC level
- Category 'B1'Project: Cluster of mine leases of area > 25 hectares with individual lease size < 50ha and to be dealt at SEIAA/SEAC level
- Category 'A' Project: Cluster of any size with any of the individual lease >50ha and to be dealt at MoEFCC/EAC level

The schematic presentation of requirements on Environmental Clearance of Sand Mining including cluster situation is detailed as below:-

Area of Lease (Hectare)	Category of Project	Require-ment of EIA / EMP	Require-ment of Public Hearing	Require-ment of EC	Who can prepare EIA/ EMP	Who will apply for EC	Authority to appraise/ grant EC	Authority to monitor EC compliance
EC Proposal of Sand Mining in cluster situation								
Cluster area of mine leases up to 5 ha	**'B2'**	Form-1M, PFR and Approved Mine Plan	No	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	DEAC/ DEIAA/	DEIAA SEIAA SPCB CPCB MoEFCC Agency nominated by MoEFCC
Cluster area of Mine leases > 5 ha and < 25 ha with no individual lease > 5 ha	**'B2'**	Form-I, PFR and Approved Mine Plan and one EMP for all leases in the Cluster	No	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	DEAC/ DEIAA/	
Cluster of mine leases of area > 25 hectares with individual lease size < 50ha	**'B1'**	Yes	Yes	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	SEAC/ SEIAA	

Cluster of any size with any of the individual lease > 50ha	**'A'**	Yes	Yes	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	EAC/ MoEFCC	

MANAGEMENT OF SAND DEPOSITED AFTER FLOOD ON AGRICULTURAL FIELD OF FARMERS

The Standing Committee on Water Resources on issues, concerning flood management, compensation, and status of ownership of submerged and eroded land in the country including compensation to farmers for loss of their crops destroyed by floods and right to disposal of the sand left in the fields of farmers in its meeting held on 29.04.2015 made observations on this subject.

The Committee observed that pursuant to Hon'ble Supreme Court of India decision in "Deepak Kumar Case" in 2012, regulations were framed by the Ministry of Mines to guide environmental clearance of minor minerals. … The Committee, therefore, desires the Ministry of Water Resources, River Development and Ganga Rejuvenation to work in close coordination with the Ministry of Mines and Environment, Forest and Climate Change to frame regulations / Guideliness in this regard expeditiously.

Mining of Sand

The Committee further observed that due to the floods, the agricultural land of farmer is destroyed and rendered infertile. Further the farmer loses his livelihood as the produce of his land is destroyed by flood and become unsalable. The farmer is also deprived of the right of lifting sand from his land. He is therefore, left helpless and destitute and leave their land in search of job.

The Committee observes that "mining operation" means any operation undertaken for the purpose of winning any mineral. Accordingly, if desilting is undertaken perse with the objective of winning a mineral then only it will be construed as a mining operation. Apparently, if the desilting is undertaken not for winning any mineral, it will not be construed as mining operation and therefore, the farmer can remove the sand from the land without requiring the requisite permits. However, the Committee strongly feels that the farmer be given the right to use and dispose-off the sand accumulated over their land post flood, by incorporating the necessary provisions in the Mines and Mineral (Development and Regulation) Act, 1957".

Removal of sand from the agricultural field by the owner farmer of the land from environment point of view will not be considered as mining operation and its removal and disposal can be allowed without the requirement of environment clearance till it is done only to the extent of reclaiming the agricultural land. The sand deposited after flood only be removed, so no mining / digging below the ground level is allowed. For removing sand in case where private land has gone into the river due to erosion, the requirement of mining lease and environment clearance will continue. This operation

of removal of sand deposited on agricultural field should be done after a mapping of deposition is done by the Land Management Committee of the Gram Panchayat. The sand so deposited post flood can be removed by the farmer owning the land / group of farmers affected by this post flood sand deposition or the Gram Panchayat. Customary rights to remove and dispose off the sand should be given to the farmer affected by deposition of sand on account of sudden flood in his agricultural land.

MINING OF SAND FROM AGRICULTURAL FIELD

This practice is prevalent in Haryana, where the top layer of soil varying between 1 and 2 meters is removed and stacked separately and thereafter the sand deposit which may be 10-15 meter deep is mined. After removing the sand layer up to a maximum depth of 09 meters, the top soil stacked is spread out on the field and the same is brought under the cultivation. Though the level of this land (mined out area) is lowered to the depth of the excavation and in initial years of cultivation the productivity is low, but the productivity of the fields improves with continued cultivation and addition of organic manure in the field. In Haryana some leases are of large area (ranging from 1000 hectare to 2000 hectare) the agricultural fields and river bed both are included in the same lease for mining.

The following recommendations should be kept in mind for mining in such leases:

1. Mining of sand in such mine leases will require environment clearance.
2. The lease should be of sand mining either from the agricultural field or river. In same lease both type of area should not be included.
3. The sand mining from agricultural field is being done in Haryana for a long time and it can be done in a more sustainable manner without adverse impact on agricultural productivity, if proper environmental safeguards are taken.
4. The slope of mining area adjacent to agricultural fields should be proper (preferably 45-60 degree) and adequate gap (minimum 10 feet) be left from adjacent agricultural field to avoid erosion and scouring.

CUSTOMARY RIGHT ON SAND MINING

The native people have their long held customary rights to take silt, sand & soil from their tanks and nearby rivers for their use or community works in the village in almost all the States in some form or the other.

Next to the reserved forests, tanks and rivers are the biggest common properties in India. Most of the village tanks are 'government properties' with some exceptions of privately held tanks. Land revenue department, irrigation department and forest department is given powers to deal with property right' and hence protecting all tanks and rivers preventing damages including encroachments is their responsibility. The local villagers were given 'customary rights' under the Revenue Department Orders, and other laws related to Panchayats and Easements to take sand, soil and earth for agricultural and domestic purposes without seeking any permission from anyone. The States strive to keep these customary rights to use such resources like soil and sand for individuals work and community work in the village intact without requirement of any permit and clearance. These customary rights need to be protected and respected.

DESILTING OF RESERVOIRS / BARRAGES / ANNECUTS / LAKES / CANALS

These structures are generally in possession and maintenance of Irrigation Department / Minor Irrigation Department / PHED of State Governments. The dams and reservoirs can be a significant source of sand. Many such structures are silted and their water holding capacity has gone down considerably. In some instances to compensate for silted capacity raising of height of dam or construction of new structures is proposed which further leads to submergence of new areas of agricultural field and forests. Taking up desilting of such projects can serve dual purpose of increasing the water holding capacity and making available the sand for other usage. In some States the Irrigation Department is permitted to use it for the departmental works free of charge and balance can be disposed of in market after paying the due royalty. A detailed study is required to be carried out to verify economic viability and environmental sustainability before contemplating dredging of storage reservoirs for sand / gravel mining.

The de-silting of reservoir, dredging for upkeep and maintenance of structures, channels and averting natural disasters will not be treated as mining for the purpose of environmental clearance.

The Ministry of Water Resources (MoWR) view on desiltation from flood control point of view is as follows:

A multidisciplinary Committee (Mittal Committee) under the chairmanship of Dr. B.K. Mittal, former Chairman, Central Water Commission was constituted by MoWR, vide letter dated 08.10.2001 to identify cause and extent of siltations in rivers, suggest measures to minimize siltation, examine as to whether desilting is a technically feasible means to minimize magnitude of flood in rivers, suggest appropriate technology/ methods of desilting of rivers, propose a realistic operational programme in a time bound manner and other related aspects. The committee studied in respect of few sites on Ganga, Brahmputra, Godavari, Krishna etc., and inter-alia concluded that:

i) Siltation in river is not pronounced and alarming;

ii) Desilting of rivers for flood control is not an economically viable solution;

iii) Dredging in general has been found to be inadequate and should not be resorted to, particularly in major rivers;

iv) There are, of course, some locations such as tidal rivers, confluence points with narrow constrictions and the like which can be tackled by desilting after thorough examination and techno-economic justification;

v) Selective dredging is suggested depending upon local conditions; and

vi) Desilting of rivers can marginally minimize the magnitude of floods and be effective only for a short period.

Thus, desilting in general is not feasible technically, due to several reasons like non-sustainability, non- availability of vast land required for disposal of dredged material etc. This cannot be viewed in isolation of other approaches to manage floods. Desilting of rivers in vulnerable reaches may be suggested based on model study, if it is found techno-economically viable. For navigation purposes, the river reaches in the water ways path may be dredged to have minimum depth of water.

MINING PLAN

The Environment Clearance shall be given to only those mining leases which have mine plan approved by the Competent Authority designated by the States. Modification of the mining plan during operation will also need approval of the Competent Authority. The Mining Plan shall be prepared by the Recognised Qualified Persons (RQP). The person to be recognized for preparing the mining plan should be a holding a degree of Mining Engineering, Environmental Engineering or a post graduate degree in Geology granted by a University established or incorporated by or under a Central Act or a State Act including any institutions recognized by the UGC or any equivalent qualification granted by any University or institution outside India and have a professional experience of three years of working in a supervisory capacity in the field of mining after obtaining a degree. The States will devise their own mechanism of selection and empanelment of RQPs. A mining plan should be valid for a period of 5 years, which can be renewed further.

EVALUATING THE IMPACT OF SAND MINING

To assess the impact of mining and effect of remedial measures can be assessed through monitoring. This is also required for mid-course corrections. Monitoring will provide data to evaluate the upstream and downstream effects of sand and gravel extraction activities, and long-term changes. A brief report summarizing the annual results of the physical and biological monitoring should document the evolution of the sites over time, and the cumulative effects of sand and gravel extraction. The summary should also recommend any modification of extraction rates needed to minimize impacts of extraction.

Sand Replenishment, Geomorphology and Hydrology:

Physical monitoring requirements of sand and gravel extraction activities should include surveyed channel cross-sections, longitudinal profiles, bed material measurements, geomorphic maps, and discharge and sediment transport measurements. The physical data will illustrate bar replenishment and any changes in channel morphology, bank erosion, or particle size.

In addition to local monitoring for replenishment at specific mining sites, monitoring of the entire reach through the estuary will provide information on the cumulative response of the system to sand and gravel extraction. For example, it is important for downstream bars and the estuary to receive sufficient sand and gravel to maintain estuarine structure and function. Because the elevation of the bed of the channel is variable from year to year, a reach-based approach to monitoring will provide a larger context for site-specific changes. If long-term monitoring data show that there is a reach-scale trend of bed lowering (on bars or in the thalweg), the extraction could be limited.

Cross-sections:

Surveyed channel cross-sections should be located at permanently documented sites upstream, downstream and within the extraction area. Cross-sections intended to show reach- scale changes

should be consistently located over geomorphic features such as at the head of riffles, across the deepest part of pools, or across particular types of channel bars.

Cross-section spacing should be close enough to define the morphology of the river channel. Cross-section data should be surveyed in March or April to evaluate changes that may occur during the flooding season.

Cross-section data should be collected over the reach to the estuary, and locally upstream, downstream, and within each mining site. This long-term monitoring data should be collected and analyzed even if no mining occurs in order to understand and estimate the sand budget of the river reach.

Photo-documentation:

Photographs of the project sites should be taken prior to excavation to document the baseline conditions, and again during each monitoring session. Photos should be taken twice a year. Photos of structures nearby like outfalls / off-takes, intakes, bridges and other structures may also be regularly taken.

Groundwater Level:

Monitoring wells should be established adjacent to each off-channel floodplain excavation to record changes in ground water levels. Measurements should be taken monthly. This should help analyse surface water and ground water interaction along the reach.

Extent and Quality of Riparian Vegetation:

Document the extent and quality of riparian vegetation, including successional status, and any increase in disturbance indicators (non-native plants). The extent of riparian habitat can be determined utilising aerial photos. Habitat quality data, i.e., successional status and species composition, must be determined through field reconnaissance.

Riparian Vegetation Maps:

Develop yearly maps of the sensitive habitat areas and document their aerial extent over time. These maps may be combined with the geomorphic maps. Monitor sites identified as sensitive for disturbance in excess of expected geomorphic trends - i.e., massive bank wasting up or downstream from an active mine site. Monitor sand and gravel mining impacts which may translate up and downstream, causing accelerated erosion of sensitive zones and impacting the ability of new habitat to form due to excessive scour or sedimentation.

This monitoring / documentation should be done by the EC holders and will be regularly checked and assessed by the DEIAA for corrective steps in time. The DEIAA should review the status of monitoring and documentation data of each mining site especially for sand mining once in a year.

MONITORING SYSTEM FOR SUSTAINABLE SAND MINING

The implementation of these Guideliness on Sustainable Sand Mining is not possible till States create a robust mechanism to monitor the mining operation and measure the mined out mineral. The entire exercise of Environment Impact Assessment and Environment Management Plan aims towards making the mining process environmentally sustainable. The Environment Clearance letter indicates the EC capacity that is the quantity of material which can be mined in a year. If this quantity is not measured, and much more mineral than envisaged in the EC is mined out then the entire process of EC is rendered futile. Keeping above objective in mind it is required of the State / State Agencies to create and establish a robust system to monitor and measure the mined out mineral at each lease location and its transportation in State.

The State Governments have tried various methods for monitoring the sand mining in their areas, the main feature of which generally has been through Transport Permits (T.P.). The printing of Transport Permits on security paper, invisible ink mark, fugitive ink background, VOID pantograph and Unique Barcode are some of the tools used by the States. These tools need to be backed by suitable software and dedicated websites with security certifications at different levels.

The system proposed is that States should issue Transport Permit. Bar code on the T.P. when scanned using the system, will generate a unique invoice number. The bidder has to enter destination, distance between plot and destination, vehicle number etc in the system. After scanning, unique bar code number; invoice date & time and validity date & time is sent to the bidder, which need to be written on T.P. Validity of T.P. is calculated based on distance between plot and destination. After validity time is over the T.P. stands invalid. The officers involved in monitoring should be provided with the android application using which the T.P. can be checked anywhere on road. As soon as the bar code on T.P. gets scanned through using android application, all details of T.P. such as plot details, vehicle details, validity time etc. should get fetched from server. This means, if anything is re-written on T.P. and attempt is made to reuse the same, it can be traced immediately. Registering of T.P. on server can be done using website, using android application (smartphone with internet) or even through SMS (smartphone without internet). This implies that TP can be registered on server even if only mobile phone range is available on plot. Various reports can be generated using the system showing daily lifting reports and user performance report. This way the vehicles carrying sand can be tracked from source to destination.

MONITORING SYSTEM FOR SUSTAINABLE SAND MINING

PROCEDURE FOR MONITORING OF SAND MINING OR RIVER BED MINING

1. The security feature of Transport Permit shall be as under:

(a) Printed on Indian Banks' Association (IBA) approved Magnetic Ink Character Recognition (MICR) Code paper.

(b) Unique Barcode.

(c) Unique Quick Response (QR) code.

(d) Fugitive Ink Background.

(e) Invisible Ink Mark.

(f) Void Pantograph.

(g) Watermark.

2. Requirement at Mine Lease Site:

(a) Small Size Plot (Up to 5 hectare): Android Based Smart Phone.

(b) Large Size Plots (More than 5 hectare): CCTV camera, Personal Computer (PC), Internet Connection, Power Back up.

(c) Access control of mine lease site.

(d) Arrangement for weight or approximation of weight of mined out mineral on basis of volume of the trailer of vehicle used.

3. Scanning of Transport Permit or Receipt and Uploading on Server:

(a) Website: Scanning of receipt on mining site can be done through barcode scanner and computer using the software;

(b) Android Application: Scanning on mining site can be done using Android Application using smart phone. It will require internet availability on SIM card;

(c) SMS: Transport Permit or Receipt shall be uploaded on server even by sending SMS through mobile. Once Transport Permit or Receipt get uploaded, an unique invoice code gets generated with its validity period.

4. Proposed working of the system:

The State Mining Department should print the Transport Permit or Receipt with security features enumerated at Paragraph 1 above and issue them to the mine lease holder through the District Collector. Once these Transport Permits or Receipts are issued, they would be uploaded on the server against that mine lease area. Each receipt should be preferably with pre-fixed quantity, so the total quantity gets determined for the receipts issued.

When the Transport Permit or Receipt barcode gets scanned and invoice is generated, that particular barcode gets used and its validity time is recorded on the server. So all the details of transporting of mined out material can be captured on the server and the Transport Permit or Receipt cannot be reused.

5. Checking On Route:

The staff deployed for the purpose of checking of vehicles carrying mined mineral should be in a position to check the validity of Transport Permit or Receipt by scanning them using website, Android Application and SMS.

6. Breakdown of Vehicle:

In case the Vehicle breakdown, the validity of Transport Permit or Receipt shall be extended by sending SMS by driver in specific format to report breakdown of vehicle. The server will register this information and register the breakdown. The State can also establish a call centre, which can register breakdowns of such vehicles and extend the validity period. The subsequent restart of the vehicle also should be similarly reported to the server or call centre.

7. Tracking of Vehicles:

The route of vehicle from source to destination can be tracked through the system using check points, RFID Tags, and GPS tracking.

8. Alerts or Report Generation and Action Review:

The system will enable the authorities to develop periodic report on different parameters like daily lifting report, vehicle log or history, lifting against allocation, and total lifting. The system can be used to generate auto mails or SMS. This will enable the District Collector or District Magistrate to get all the relevant details and shall enable the authority to block the scanning facility of any site found to be indulged in irregularity. Whenever any authority intercepts any vehicle transporting illegal sand, it shall get registered on the server and shall be mandatory for the officer to fill in the report on action taken. Every intercepted vehicle shall be tracked.

The monitoring of mined out mineral, environmental clearance conditions and enforcement of Environment Management Plan will be ensured by the DEIAA, SEIAA and the State Pollution Control Board or Committee. The monitoring arrangements envisaged above shall be put in place. The monitoring of enforcement of environmental clearance conditions shall be done by the Central Pollution Control Board, Ministry of Environment, Forest and Climate Change and the agency nominated by the Ministry for the purpose.

ADMINISTRATIVE STRUCTURE FOR ENVIRONMENT CLEARANCE AND ENSURING COMPLIANCE OF EC CONDITIONS

An no mining in allowed without Envirnomental Clearance. The process of EC involves preparation of EIA/EMP, PER and mine plan.

The EIA/EMP can be prepared by the State Government or any agency of the State, group of project proponents in the cluster or the individual project proponent. The EIA / EMP can be prepared by the accredited consultants or the Registered Qualified Person(s) / agencies selected by the States.

DISTRICT ENVIRONMENT IMPACT ASSESSMENT AUTHORITY

The Central Government has constituted the District Level Environment Impact Assessment Authority (DEIAA), for grant of environmental clearance for Category 'B2' Projects for mining of minor minerals, for all the districts in the country.

For, minor minerals including sand and gravel mining lease of area up to 5 hectare in case of individual lease and up to 25 ha in case of cluster for sand mining, the grant of EC will be done by the District Environment Impact Assessment Authority (DEIAA) headed by the District Magistrate or District Collector. This Authority will be responsible for proper and sustainable management of sand mining in the district. The Authority will be responsible for designating the area / stretch in river suitable for mining in the district and also identifying the area / stretch in river prohibited for sand mining. The Authority will ensure clear demarcation of mining site, its documentation, and ensuring that no mining takes place without EIA / EMP and EC of the mining site.

The Chairperson and official members of the Authority for the districts should hold office during their tenure in the district on said posts and the expert member shall hold office for a period of three years from the date of nomination by the Competent Authority. The Committee shall meet at least once in a month.

The District Environment Impact Assessment Authority (DEIAA) :

The DEIAA will have following composition :

1.	District Magistrate or District Collector of the district	Chairperson
2.	Senior most Divisional Forest Officer in the district	Member
3.	An expert member to be nominated by the Divisional Commissioner or Chief Conservator of the Forest	Member
4.	Sub-Divisional Magistrate or Sub-Divisional Officer of the district head quarter	Member-Secretary

DISTRICT LEVEL EXPERT APPRAISAL COMMITTEE:

The District Level Expert Appraisal Committee (DEAC) will appraise the cases and make recommendations to the District Environment Impact Assessment Authority for environmental clearance. This Committee will also make recommendations / suggestions on the District Survey Report to the DEIAA. The DEAC will have following composition:

1.	Senior most Executive Engineer, Irrigation Department	Chairperson
2.	Senior most Sub-Divisional Officer (Forest)	Member
3.	A representative of Remote Sensing Department or Geology Department or State Ground Water Department to be nominated by the District Magistrate or District Collector	Member
4.	Occupational health expert or Medical Officer to be nominated by the District Magistrate or District Collector	Member
5.	Engineer from Zila Parishad	Member
6.	A representative of State Pollution Control Board or Committee	Member
7.	An expert to be nominated by the Divisional Commissioner or Chief Conservator of Forest	Member
8.	An expert to be nominated by the Divisional Commissioner or Chief Conservator of Forest	Member
9.	An expert to be nominated by the Divisional Commissioner or Chief Conservator of Forest	Member
10.	Senior most Assistant Engineer, Public Works Department	Member
11.	Assistant Director or Deputy Director or District Mines Officer or Geologist in the district in that order	Member- Secretary

The DEAC will meet at least once a month, depending on the work load the frequency of meetings can be decided by the Chairperson of DEAC and Chairperson, DEIAA.

Each proposal for the mining lease under consideration for environmental clearance in the district will be inspected on-site by the Sub-Divisional Level Committee headed by the SDM.

The Sub-Divisional Committee should comprise of following officers:

Sub-Divisional Magistrate	Chairperson
Sub-Divisional Officer, Forest/ Assistant Conservator of Forest/ Forest Range Officer	Member
Representative of State Pollution Control Board	Member
SDO, Irrigation Department	Member
Geologist or Assistant Geologist or Mining Officer / Mining Inspector	Member

The presence of at least three members will be needed for inspection. This Committee shall submit its report within 15 days from the receipt of the proposal.

The monitoring of EC conditions and enforcement of EMP will be ensured by the District Collector and the, State Pollution Control Board. The monitoring of enforcement of EC conditions can also be done by the Central Pollution Control Board, Ministry of Environment, Forest & Climate Change and the agency nominated by the Ministry for the purpose.

Schematic Presentation of Requirements on Environmental Clearance of Sand Mining including cluster situation

Area of Lease (Hectare)	Category of Project	Require-ment of EIA / EMP	Require-ment of Public Hearing	Require-ment of EC	Who can prepare EIA/ EMP	Who will apply for EC	Authority to appraise/ grant EC	Authority to monitor EC compliance
EC Proposal of Sand Mining on the basis of individual mine lease								
0 - 5ha	**'B2'**	Form - 1M, PFR and Approved Mine Plan	No	Yes	Project Proponent	Project Proponent	DEAC/ DEIAA	DEIAA SEIAA SPCB CPCB MoEFCC Agency nominated by MoEFCC

> 5 ha and < 25 ha	**'B2'**	Form-I, PFR and Approved Mine Plan and EMP	No	Yes	Project Proponent	Project Proponent	SEAC / SEIAA	DEIAA SEIAA SPCB CPCB MoEFCC Agency nominated by MoEFCC
≥ 25ha and < 50ha	**'B1'**	Yes	Yes	Yes	Project Proponent	Project Proponent	SEAC / SEIAA	
≥ 50 ha	**'A'**	Yes	Yes	Yes	Project Proponent	Project Proponent	SEAC / SEIAA	
EC Proposal of Sand Mining in cluster situation								
Cluster area of mine leases up to 5 ha	**'B2'**	Form - 1M, PFR and Approved Mine Plan	No	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	DEAC/ DEIAA/	DEIAA SEIAA SPCB CPCB MoEFCC Agency nominated by MoEFCC
Cluster area of Mine leases > 5 ha and < 25 ha with no individual lease > 5 ha	**'B2'**	Form -I, PFR and Approved Mine Plan and one EMP for all leases in the Cluster	No	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	DEAC/ DEIAA/	

Cluster of mine leases of area ≥ 25 hectares with individual lease size < 50ha	**'B1'**	Yes	Yes	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	SEAC/ SEIAA	
Cluster of any size with any of the individual lease ≥ 50ha	**'A'**	Yes	Yes	Yes	State, State Agency, Group of Project Proponents, Project Proponent	Project Proponent	EAC/ MoEFCC	

General Conditions will not apply on account of inter- state boundaries for river sand mining leases.

EXEMPTION OF CERTAIN CASES FROM BEING CONSIDERED AS MINING FOR THE PURPOSE OF REQUIREMNT OF ENVIRONMENTAL CLEARANCE

Keeping in view the purpose, maintenance of infrastructure, abatement of disasters, customary easement and property rights, it is felt that following cases may not be treated as mining for the purpose of requirement of environmental clearance. The following cases shall not require prior environmental clearance, namely:-

1. Extraction of ordinary clay or sand, manually, by the Kumhars (Potter) to prepare earthen pots, lamp, toys, etc. as per their customs.
2. Extraction of ordinary clay or sand, manually, by earthen tile makers who prepare earthen tiles.
3. Removal of sand deposits on agricultural field after flood by farmers.
4. Customary extraction of sand and ordinary earth from sources situated in Gram Panchayat for personal use or community work in village.
5. Community works like de-silting of village ponds or tanks, construction of village roads, ponds, bunds undertaken in Mahatama Gandhi National Rural Employment and Guarantee Schemes, other Government sponsored schemes, and community efforts.
6. Dredging and de-silting of dams, reservoirs, weirs, barrages, river, and canals for the purpose of their maintenance, upkeep and disaster management.
7. Traditional occupational work of sand by Vanjara and Oads in Gujarat vide notification number GU/90(16)/MCR-2189(68)/5-CHH, dated the 14th February, 1990 of the Government of Gujarat.
8. Digging of well for irrigation or drinking water.
9. Digging of foundation for buildings not requiring prior environmental clearance.
10. Excavation of ordinary earth or clay for plugging of any breach caused in canal, nala, drain, water body, etc., to deal with any disaster or flood like situation upon orders of District Collector or District Magistrate.
11. Activities declared by State Government under legislations or rules as non- mining activity with concurrence of the Ministry of Environment, Forest and Climate Change, Government of India.

STANDARD ENVIRONMENTAL CONDITIONS FOR SAND MINING

Impact Category	S.No.	Environmental Conditions
Stakeholder Engagement	1	In the case of private land not owned by the lease holder an affidavit should be obtained regarding consent of the concerned land owner (s) for carrying out the mining operation.
	2	Stakeholder awareness and ability to raise concerns and getting it to be addressed.
	3	Implementation of Action Plan on the issues raised during the Public Hearing. The Proponent shall complete all the tasks as per the Action Plan submitted with the budgetary provisions during the Public Hearing.
	4	Having valid lease and all the permits is very much needed.
	5	To establish a Monitoring Committee including Local Panchayat, to check on traffic due to transportation and submit an annual report on the same.
	6	The directions given by the Hon'ble Supreme Court of India vide order dated 27.02.2012 in Deepak Kumar case [SLP(C) Nos. 19628-19629 of 2009] and order dated 05.08.2013 of the Hon'ble National Green Tribunal in application No. 171/2013 may be strictly followed.
	7	All the provisions made and restrictions imposed as covered in the Minor Mineral Rule, shall be complied with, particularly regarding Environment Management Practices and its fund management and Payment of compensation to the land owners.
Sustainable Mining Practices	8	District level Survey Report should be prepared and area suitable for mining and area prohibited for mining be identified.
	9	The depth of mining in Riverbed shall not exceed one meter or water level whichever is less, provided that where the Joint Inspection Committee certifies about excessive deposit or over accumulation of mineral in certain reaches requiring channelization, it can go up to 3 meters on defined reaches of the River.
	10	No River sand mining be allowed in rainy season.
	11	To submit annual replenishment report certified by an authorized agency. In case the replenishment is lower than the approved rate of production,

		then the mining activity / production levels shall be decreased / stopped accordingly till the replenishment is completed.
	12	Ultimate working depth shall be up to 3.0 m from Riverbed level and not less than one meter from the water level of the River channel whichever is reached earlier. In hilly terrain this depth be preferably restricted to one meter.
	13	In River flood plain mining a buffer of 3 meter to be left from the River bank for mining.
	14	In mining from agricultural field a buffer of 3 meter to be left from the adjacent field.
	15	Mining shall be done in layers of 1 meter depth to avoid ponding effect and after first layer is excavated, the process will be repeated for the next layers.
	16	To maintain safety and stability of Riverbanks i.e. 3 meter or 10% of the width of the River whichever is more will be left intact as no mining zone.
	17	No stream should be diverted for the purpose of sand mining. No natural water course and/ or water resources are obstructed due to mining operations.
	18	No blasting shall be resorted to in River mining and without permission at any other place.
	19	Depending upon the location, thickness of sand, deposition, agricultural land/Riverbed, the method of mining may be manual, semi-mechanized or mechanized; however, manual method of mining shall be preferred over any other method.
Identification and Preparation of Mining Site	20	Mining should be done only in area / stretch identified in the District Level Survey Report suitable for mining and so certified by the Sub-Divisional Level Committee after site visit.
	21	Mining should begin only after pucca pillar marking the boundary of lease area is erected at the cost of the lease holder after certification by the mining official and its geo coordinates are made available to the District Level Committee.
	22	The top soil in case of surface land mining shall be stored temporarily in an earmarked site and concurrently used for land reclamation.

Monitoring the Mining of Mineral and its Transportation	23	The EC holder shall keep a correct account of quantity of mineral mined out, dispatched from the mine, mode of transport, registration number of vehicle, person in-charge of vehicle and mine plan. This should be produced before officers of Central Government and State for inspection.
	24	For each mining lease site the access should be controlled in a way that vehicles carrying mineral from that area are tracked and accounted for.
	25	The State / District Level Environment Committee should use technology like Bar Coding, Information and Communications Technology (ICT), Web based and ICT enabled services, mobile SMS App etc. to account for weight of mineral being taken out of the lease area and the number of trucks moving out with the mineral.
	26	There should be regular monitoring of the mining activities in the State to ensure effective compliance of stipulated EC conditions and of the provisions under the Minor Mineral Concessions Rules framed by the State Government.
Noise Management	27	Noise arising out of mining and processing shall be abated and controlled at source to keep within permissible limit.
	28	Restricted working hours. Sand mining operation has to be carried out between 6 am to 7 pm.
Air Pollution and Dust Management	29	The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly.
	30	Air Pollution due to dust, exhaust emission or fumes during mining and processing phase should be controlled and kept in permissible limits specified under environmental laws.
	31	The mineral transportation shall be carried out through covered trucks only and the vehicles carrying the mineral shall not be overloaded. Wheel washing facility should be installed and used.
Management of Visual Impact	32	The mining operations are to be done in a systematic manner so that the operations shall create a major visual impact on the site.
Bio-Diversity Protection	33	Restoration of flora affected by mining should be done immediately. Twice the number of trees destroyed by mining to be planted preferably of indigenous species. Each EC holder should plant and maintain for lease period at least 5 trees per hectare in area near lease.
	34	No mining lease shall be granted in the forest area without forest clearance in accordance with the provisions of the Forest Conservation Act, 1980 and the rules made thereunder.

	35	Protection of turtle and bird habitats shall be ensured.
	36	No felling of tree near quarry is allowed. For mining lease within 10km of the National Park / Sanctuary or in Eco-Sensitive Zone of the Protected Area, recommendation of Standing Committee of National Board of Wild Life (NBWL) have to be obtained as per the Hon'ble Supreme Court order in I.A. No. 460 of 2004.
	37	Spring sources should not be affected due to mining activities. Necessary Protection measures are to be incorporated.
Management of Instability and Erosion	38	Removal, stacking and utilization of top soil in mining are should be ensured. Where top soil cannot be used concurrently, it shall be stored separately for future use keeping in view that the bacterial organism should not die and should be spread nearby area.
	39	The EC should stipulate conditions for adequate steps to check soil erosion and control debris flow etc. by constructing engineering structures
	40	Use of oversize material to control erosion and movement of sediments
	41	No overhangs shall be allowed to be formed due to mining and mining shall not be allowed in area where subsidence of rocks is likely to occur due to steep angle of slope.
	42	No extraction of stone / boulder / sand in landslide prone areas.
	43	Controlled clearance of riparian vegetation to be undertaken
Waste Management	44	Site clearance and tidiness is very much needed to have less visual impact of mining.
	45	Dumping of waste shall be done in earmarked places as approved in Mining Plan.
	46	Rubbish burial shall not be done in the Rivers.
Pollution Prevention	47	The EC holder shall take all possible precautions for the protection of environment and control of pollution.
	48	Effluent discharge should be kept to the minimum and it should meet the standards prescribed.
Protection of Infrastructure	49	Mining shall not be undertaken in a mining lease located in 200-500 meter of bridge, 200 meter upstream and downstream of water supply / irrigation scheme, 100 meters from the edge of National Highway and railway line, 50 meters from a reservoir, canal or building, 25 meter from the edge of State Highway and 10 meters from the edge of other

		roads except on special exemption by the Sub-Divisional level Joint Inspection Committee.
	50	For carrying out mining in proximity to any bridge or embankment, appropriate safety zone (not less than 200 meters) should be worked out on case to case basis, taking into account the structural parameters, location aspects and flow rate, and no mining should be carried out in the safety zone so worked out.
	51	Mining activities shall not be done for mine lease where mining can cause danger to site of flood protection works, places of cultural, religious, historical, and archeological importance.
Enhancement Road Safety	52	Vehicles used for transportation of sand are to be permitted only with **of** fitness and PUC Certificates.
	53	Junction at takeoff point of approach road with main road be properly developed with proper width and geometry required for safe movement of traffic by concession holder at his own cost.
	54	Project Proponent shall ensure that the road may not be damaged due to transportation of the mineral; and transport of minerals will be as per IRC Guideliness with respect to complying with traffic congestion and density.
	55	No stacking allowed on road side along National Highways.
Closure and Reclamation of Mined Out Area	56	The Project Proponent shall undertake phased restoration, reclamation and rehabilitation of land affected by mining and completes this work before abandonment of mine.
	57	Restoration, reclamation and rehabilitation in cluster should be done systematically and jointly by each EC holder in that cluster. This should be appropriately reflected as EC condition in each EC in cluster.
	58	Site specific plan with eco-restoration should be in place and implemented.
Health and Safety	59	Health and safety of workers should be taken care of.
	60	Transport of mineral will not be done through villages / habitations.
	61	The Project Proponent shall make arrangement for drinking water, first aid facility (along with species specific anti-venom provisioning) in case of emergency for the workers.

	62	Project Proponent shall implement the Disaster Management Plan if the mine lease area is located in Seismic Zone-IV. Project Proponent shall appoint a Committee to have a check over any disaster to warn workers well before for the safety of the workers. Emergency helpline number will be displayed at all levels.
	63	Project Proponent shall appoint an Occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the Project and records maintained; also, Occupational health check-ups for workers having some ailments like BP, diabetes, habitual smokers, etc. shall be undertaken once in six months and necessary remedial/preventive measures taken accordingly. Recommendations of National Institute for Labour for ensuring good occupational environment for mine workers would also be adopted.
Monitoring the Impact of Mining	64	The Project Proponent shall report monitoring data on replenishment, traffic management, levels of production, River Bank erosion and maintenance of Road etc.
Mineral Conservation	65	Use of alternate material such as M-sand in place of natural River sand shall be encouraged in order to reduce stress on natural eco-system.

APPENDIX: TABLE - 1

REVENUE FROM SAND MINING IN STATES / UTs

(Rs. in crores)

Sl.No.	STATE / U.T	2012 - 2013	2013 - 2014	2014 - 2015
01	Andaman & Nicobar	0.073	0	0
02	Arunachal Pradesh	7	8	5
03	National Capital Territory of Delhi	0	0	
04	Himachal Pradesh	0.70	0.35	0.07
05	Jharkhand	4.25	3.04	0.07
06	Karnataka	23.74	15.33	25.99
07	Madhya Pradesh	184.93	179.41	172.53
08	Meghalaya	14.50	15.88	15.50 (as forest royalty from govt. contractors)
09	Mizoram	0.018	0.0475	0.0861
10	Puducherry	0.80	0.20	0.03
11	Rajasthan	173.36	252.06	134
12	Tamil Nadu	188.50	117.73	109.10
13	Uttar Pradesh	97.27	166.45	168.38

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 2

NUMBER OF MINING LEASES IN STATE

Sl.No.	STATE / U.T	In stream	Flood Plain	Sea Shore	Agricul-tural field	River	Total
01	Andaman & Nicobar						Nil
02	Andhra Pradesh						Nil
03	Haryana	5	12		7		31
04	Jammu & Kashmir					650	650
05	Jharkhand	10				387	397
06	Lakshadweep					1090	1090
07	Manipur						NIL
08	Meghalaya						NIL
09	Odisha						NIL
10	Punjab	2 + 80 Temporary Working Permit				73	155
11	Sikkim		85				85
12	Tripura	21	244		5		270

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 3

AVERAGE SIZE OF SAND MINING LEASES IN STATE / UT: 2014-15

(In Hectare)

Sl.No.	STATE / U.T	AVERAGE SIZE	SMALLEST MINING LEASE AREA	LARGEST MINING LEASE AREA
01	Andaman & Nicobar	NOT APPLICABLE		
02	Arunachal Pradesh	ONLY MINING PERMITS		
03	Himachal Pradesh	1.20	0.25	4.09
04	Jharkhand	0.25	0.13	87.38
05	Karnataka	5	5	19.42
06	Madhya Pradesh	8.52	0.30	306.98
07	Meghalaya	Mostly < 1.5 ha.		
08	Mizoram	NA		
09	Puducherry	NA		
10	Rajasthan	2 5 in Bikaner	24.82 2 in Bikaner	1901.89 5 in Bikaner
11	Tamil Nadu	29 leases < 10 ha.	14 leases of 10 - 15 ha.	42 leases > 15 ha.
12	Uttar Pradesh	25	5	200

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 4

AVERAGE PERIOD OF SAND MINING LEASES IN STATE / UT

(In Hectare)

Sl.No.	STATE / U.T	AVERAGE MINING LEASE PERIOD (YEARS)
01	Andaman & Nicobar	Not Applicable
02	Arunachal Pradesh	Only mining permit is given
03	Himachal Pradesh	5
04	Jharkhand	3
05	Karnataka	2
06	Madhya Pradesh	5 to 10
07	Meghalaya	No lease in operation currently
08	Mizoram	No mining lease in operation currently
09	Puducherry	One year permit
10	Rajasthan	5 20-30 years in Bikaner
11	Tamil Nadu	3
12	Uttar Pradesh	3

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 5

COMMON METHOD AND PRACTICE OF SAND MINING IN STATE / UT

Sl.No.	STATE / U.T	COMMON METHOD AND PRACTICE OF SAND MINING
01	Andaman & Nicobar	1. The Apex Court in its order dated 7.5.2002 in I.A. No. 502 in WP (C) No. 202 of 1995, had directed that extraction of sand be phased out @ minimum 20% per year on reducing balance basis to bring the sand mining to a level of 33% of the present level of mining within a maximum period of five years. 2. Since the level of extraction of sand in the territory in the year 2001-02 i.e. the base year, was 68909 cubic meter, the quantity of extractable sand is fixed at 22581 cubic meter. 3. The quantity of sea sand so allowed by MoEF is extracted from the identified and approved sites having such deposits on the sea beaches (identified accreting area) with adequate environmental safeguards so as to prevent any damage to the sensitive coastal eco-system including corals, turtle/ bird nesting sites and the protected areas. 4. The allotment of sea sand is made to the individuals by the Sand Allotment Committee constituted by the Lieutenant Governor under the Chairmanship of Chief Secretary who also heads the A&N CZMA. The quantum of sea sand allotted is fixed by the Committee on the basis of availability of sea sand and the number of applicants (local) applied for their bonafide use.
02	Arunachal Pradesh	1. Mining of sand restricted to foothills only that too for a very short period. Grant of mining lease is kept in abeyance, short term mining permits are issued to various Central and State agencies for carrying out developmental works under the strict supervision of the departmental officers.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	COMMON METHOD AND PRACTICE OF SAND MINING
03	Himachal Pradesh	Manual. The mining lease areas are sanctioned on the river bed if the area is approved in survey document. The mining activities are allowed strictly in accordance with the approved working cum Environment Management Plan and after the environment clearance.
04	Jharkhand	Manual
05	Karnataka	Manual
06	Madhya Pradesh	Manual
07	Meghalaya	Hill quarrying in private areas
08	Mizoram	Extraction of sand limited mainly for domestic purpose in the state. The produce extracted illegally is seized as per the Mizoram Forest Act, 1955. Mining is only limited to river banks and riverbeds with improvised equipments like spade, shovel, small canoes, etc.
09	Puducherry	Manual
10	Rajasthan	In Rajasthan sand is available in seasonal streams and rivers except Chambal which is perennial but mining is banned because of Chambal Crocodile Sanctuary. Mining is done up to 3 meters and is open cast. It is filled in trucks either manually or semi mechanized method. In Bikaner no river exists and mining for sand is being done from palaeo-channel. In this palaeo-channel the sand deposit occurs at the depth of 5 meter to 20 meter below ground level with an over burden of 5 to 20 meters. The mining here is done open cast benching method, where overlying blown sand, gravel, pebble etc. is removed, the sand is further sieved, graded and washed upto 12 to 18 mesh size.
11	Tamil Nadu	Manual mining is carried out in certain quarries. In most of the sand quarries two poclains are used by the PWD.
12	Uttar Pradesh	Manual and Semi-mechanised

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 6

SUGGESTIONS / RECOMMENDATIONS FROM STATES / UTs FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
01	Andaman & Nicobar	The quantum of extractable sand fixed at 22581 cubic meter should be enhanced. This limit has been fixed by the orders of Hon'ble Supreme Court subject to study by National Institute of Oceanography.
02	Arunachal Pradesh	1. For environmentally sustainable sand mining a strict and comprehensive sand mining policy need to be framed.
		2. River sand is becoming a scarce commodity and hence exploring alternative to it has become imminent. Manufactured sand is a good alternative both for fine as well as coarse sand used in concrete.
		3. Sand mining should be restricted to surface collection only without the use of heavy machinery.
		4. Due to turbulent and inaccessible nature of rivers flowing in the hilly terrains of the state, deposition of the sand in the river bed is very negligible and except for few quarries in the foothills and plains, most of the notified quarries are boulders and mining of sand is very negligible.
		5. In view of environment related issues the grant of mining lease for river bed minor mineral viz. sand, gravel, shingle, aggregate, boulder are kept in abeyance and extraction of these minerals is regulated only by grant of mining permits, that too not exceeding 3000 cubic meter in one permit.
		6. For scientific mining of sand and other minor minerals Guideliness has been prepared and accordingly Geo-Technical Committee has been constituted under the chairmanship of ADC/SDO in the district level to determine the quantity of quarriable mineral that can be safely removed and also to give technical clearance for notification of quarries of smaller size, preferably within one hectare.
03	Chhattisgarh	1. While attempting to prepare a model Guidelines / policy for the country, the differences that exist in different states may be taken into account. It may be tried to take all stakeholders along.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
		2. To ease the process of EC granting, SEIAA may have benches across the State with each bench having a SEAC under it. Time bound clearance with ease of access and grant.
		3. Sand mining with use of machinery should be allowed.
		4. Road construction material like murram should be exempted from EC considering their local / pocket occurrences and impossibility of obtaining EC.
		5. Considering the traffic issue at urban areas and to reduce intermediaries like storage point dealers, night mining with adequate lighting should be allowed.
		6. To make the availability of sand from local rivulet / streams the river bank to in-stream mine area distance should be reduced from 10 meter to 3 meters.
04	NCT of Delhi	1. Location of sand mining should be identified by a committee comprising of revenue deptt., Irrigation Deptt., CGWB, SPCB, Forest Department and mining department. Mining area should distinctly be marked at site, before allowing mining.
		2. Depth of mining should be restricted to 3 mtrs or water level, whichever is less and that to from aggradation areas. The side slope of excavation should be less than 3:1.
		3. Requirement of sand and gravel should be reduced by utilization of construction and demolition waste. It requires not only legislative support but also awareness campaign among the society.
		4. Guidelines should be distinctly clear and easy to understand covring do's and don't during mining operation.
		5. Sufficient safe distance should be left between mining site and adjoining engineering structures like embankment, spurs, bed bars, bridges, reservoir and regulator etc.
		6. Security amount should be sufficient enough to compel the agency to carry out rehabilitation, corrective measures and to ensure strict compliance of conditions of lease. S.D. should be released after inspection of committee and recording of certificate that agency complied with the lease conditions.
		7. Mining may be carried out by state agency instead of private agaencies.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
05	Himachal Pradesh	1. Working cum Environment Management Plan has been made mandatory. The mining activities are allowed after submission of environment clearance.
		2. In compliance of order of Hon'ble Supreme Court dated 27.02.2012 in Deepak Kumar case, the Himachal Pradesh has repealed its rules called the Himachal Pradesh Minor Mineral (Concession) and Mineral (Prevention of illegal mining, transportation and Storage) Rule, 2015 in accordance to the recommendation of the Ministry of Environment & Forest and rules circulated by the Ministry of Mines. Hence the State of Himachal Pradesh has complied with the above directions of the Hon'ble Apex Court,
		3. Therefore the condition of applicability of Environment Clearance on the area less than 5 hectare shall be exempted.
		4. Further keeping in view, the peculiar topography, geography and socio-economic fabric of the State, the condition for the minimum size of the lease should be exempted as the rivers are in youth stage forming different land forms, land holdings are less, population is thin and scattered and the demand of minor mineral is limited, which could be met out locally by exploiting local resources on the small scale.
06	Jammu & Kashmir	1. Uniform Guidelines be framed for sand mining and river bed mining as they cannot be segregated.
		2. Identification of sand belts be made in consultation with CGWB and while framing Guideliness CGWB may be taken on board.
		3. Sand mining leases less than 5 hectare be exempted from EC and comprehensive policy may be made for hilly states for easing the process of grant of lease.
07	Jharkhand	1. Machine should not be used in sand mining. Only manual mining should be done.
		2. The depth of mining shall be restricted to 3 meter / water level whichever is less.
		3. No mining should be carried out in proximity of any bridge / embankment.
		4. In-stream mining should not be allowed.
		5. Mining should be done in accordance with an approved mining plan.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
		6. EC should be valid for settlement period subject to ceiling of five years.
08	Karnataka	1. Undertaking sand mining activity through a Government agency to be governed by District Level Sand Monitoring Committee headed by Deputy Commissioner.
		2. The area should be properly surveyed and mapped with the help of GPS to assign geo coordinates and accordingly erect boundary pillars so as to avoid illegal and unscientific mining.
		3. Depth of sand available may be indicated in a contour map using suitable drilled holes to ensure sand mining do not exceed one meter depth.
		4. Once thickness is established sand mining may be permitted to one meter depth where the thickness of sand is more than three meter deep. If the thickness of sand is less than three meter, sand mining shall not be permitted.
		5. Sufficient spacing shall be ensured from one block to another block and sufficient time gap shall be provided for replenishment before undertaking mining activity in the same block.
		6. Mining activity shall be restricted to only non-monsoon season and in the area that is exposed.
		7. No in-stream mining shall be permitted.
		8. No stream should be diverted for the purpose of sand mining. No natural water course and/ or water resources are obstructed due to mining operations.
		9. Site specific plan with eco-restoration should be in place.
		10. Sand mining shall be undertaken only by manual method without use of earth moving equipment such as JCB etc. Use of mechanized boats for sucking sand from in-stream area shall be strictly prohibited.
		11. Appropriate safety zones shall be maintained in proximity to any bridge / and / or embankment and other permanent structures. No sand mining shall be undertaken in such safety / buffer zones. Guideliness issued by the Ministry of Mines in this regard shall also be adhered to.
		12. The quarrying activity shall not intersect subterranean water level and ground water table.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
		13. The top soil in case of surface land mining shall be stored temporarily in an earmarked site and concurrently used for land reclamation.
		14. Use of alternate material such as M-sand in place of natural river sand shall be encouraged in order to reduce stress on natural eco-system.
09	Madhya Pradesh	1. Geographical location of the state should be taken care of.
		2. Keep provision for extraction of sand from forest areas.
		3. Expedite the EC process.
		4. In inter-state boundary leases sand mining EC be giver by the SEIAA.
		5. Clear Guidelines for B-1, B2 be issued.
		6. Simplify cluster cases.
		7. Exempt mining leases of less than 5 hectare from EC.
10	Meghalaya	1. No sand mining within 3 kilometer from Protected area and Reserved Forest area.
		2. Advance royalty etc for entire quantity of mineral be realized in full.
		3. Only loose boulder and sand are allowed to be removed from the mid river stream leaving 15 meter on either side untouched.
		4. No collection of sand is allowed on 15 meter of either side of structures like bridge, culvert etc.
		5. No blasting allowed.
		6. No extraction of stone / boulder / sand in landslide prone areas.
		7. No stacking allowed on road side along national highways.
		8. No felling of tree near quarry is allowed.
		9. No transportation of forest produce (sand from forest area) is allowed after sunset.
		10. Export fee realized if sand is sent outside the state.
		11. Stone crusher cannot be installed without permission of DFO.
		12. Tree should be planted at quarry after completion of mining.
		13. Violation of above conditions will result in cancellation of permit and forfeiture of advance royalty already paid.
11	Mizoram	1. Extraction of sand from the forest may be permitted strictly as per mining plan approved by the Competent Authority and after getting necessary clearance under various acts related to the forest and environment.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
12	Odisha	1. EC may be exempted for leases less than 5 hectare.
		2. EC should not be required for earth mining.
		3. Minor minerals even close to inter-state borders should be allowed to be cleared by the SEIAA.
		4. In case a river is forming boundary of states and mechanized mining of sand is causing tension in states it should be resolved at the national level.
13	Puducherry	1. Environment Clearance is issued by SEIAA, Puducherry strictly under the provisions of the EIA Notification, 2006 and subsequent amendments.
14	Rajasthan	1. The bajari mined out from river bed is filled back by the river itself during the next rainy season. So, nature itself reclaims the mined out area every year. The formation of bajari is a natural process in the river and it is also essential to remove bajari from the river bed to avoid silting. If the sand deposited in the river bed is not removed, it may cause change of river course and may also results in flood plains will be developed.
		2. Price control system adopted in Rajasthan. Sand is a essential commodity.
		3. The depth of mining should be restricted to 3 meters or above water table.
		4. Machinery having boom height more than 3 meter shall not be allowed in extraction of bajari.
		5. Size of mining leases be allowed below 5 hectare.
		6. In streams with low deposit of sand and if use is mostly local no mechanized mining should be allowed and EC should not be required.
		7. In larger deposits there should be semi-mechanised mining with EC.
		8. The sand (river and stream) in different categories, with their availability, use and size of the deposit. **Category A:** Small deposits in river and stream where thickness of sand bed is very less and sand is used locally in villages and towns only and no mechanical mining is done, in such areas restriction of obtaining Environment Clearance can be relaxed for manual mining.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
		Category B: Large deposits, where in rivers and streams having thickness of sand bed is medium to large, sand mining, shall be allowed with semi mechanized manner after obtaining Environment Clearance. **Bikaner District:** Bikaner district is a desert terrain where ground water table is very deep. Bajari is excavated above water table and it does not affect the water table. In addition to this boulder, gravel and waste generated due to bajari mining is used in reclamation of pits. Hence environment is not adversely affected due to bajari mining.
15	Sikkim	1. Forest department is the nodal department for sand and stone extraction from the riverbed.
		2. Use of machines is prohibited.
		3. Quarrying sites are allotted to village youth cooperatives.
		4. For bigger companies quarry sites in forest area are allotted after FC.
		5. State Government has considerations for allotment of quarries for Border Road Organization and MoD.
		6. GoI can monitor mining in states through GIS.
16	Tamil Nadu	1. Excess sand deposits identified in the flood plains and in-stream areas only to be mined in order to safeguard and maintain ground water table.
		2. Sand mining operation has to be carried out between 6 am to 7 pm.
		3. Mining operation should be carried out in a systematic manner without affecting environment and ecology of the area.
17	Uttar Pradesh	1. Depth of mining cannot be more than 3 meter or water table whichever is less.
		2. Mining can be done in slices forming benches where bench height cannot be more than 1 meter and bench width cannot be less than 10 meter.
		3. A width of not less than 50 meter or 10% width of river can be restricted for mining activities from river bank. A condition can be imposed that mining will be done from river activities from river bank.
		4. SEIAA should be decentralized to expedite EC process. It can be decentralized to district or zonal level.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	SUGGESTIONS / RECOMMENDATIONS FOR ENVIRONMENTALLY SUSTAINABLE SAND MINING
		5. Make EC conditions practical.
		6. Requirement of mining plan in river bed mining be done away with.
		7. There should not be requirement of EC for short term permit.
		8. The quantity of sand should not be fixed in EC as it leads to loss in revenue and illegal mining.
		9. Semi-mechanised form of sand mining be allowed.
		10. Sand mining to be exempted from EC as it takes 6-8 months and environment department do not have requisite work force to enforce EC conditions. A Guidelines for environmentally sustainable sand mining be framed and it can be complied by imposing it in the lease condition.
18	Uttarakhand	1. Area less than 5 hectare be exempted from EC.
		2. Use of machine be allowed for scientific mining and reducing the cost of production.
		3. RBM deposition in the lease should not be fixed for the entire lease period. RBM in lease area be assessed after rains every year.
		4. 70% of leases in state not operating for want of EC and these vacant lots are source of illegal mining.

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 7

BEST PRACTICE OF SAND MINING ADOPTED IN DISTRICT / STATE / UT

Sl.No.	STATE / U.T	DESCRIPTION OF BEST PRACTICES
01	Andaman & Nicobar	Institute of Ocean Management has been entrusted the task of identification of sand accreting sites.
02	Arunachal Pradesh	Mining of sand is restricted to foothills only that too for a very short period.
03	National Capital Territory of Delhi	In Delhi sand mining lease is granted by Revenue department. NOC from I&FC Deptt. Were issued with condition of limitation of depth, area of mining, operation timing limitation and limited period of NOC. Compliance of laid down conditions and monitoring is ensured by collector.
04	Himachal Pradesh	1. The mining activities on river beds are allowed strictly as per the provisions of river / stream bed mining policy as under.
		2. No river / stream bed mining shall be allowed without the recommendation of the Sub Divisional Level Committee constituted under the Chairmanship of Sub Divisional Magistrate having XEN PWD, Irrigation and Public Health, SPCB, DFO and Mining Officer as its member.
		3. Nor river / stream bed mining shall be allowed within 75 meter from the periphery of soil conservation works, nursery plantations, check dams or within the distance as recommended by the Sub-Divisional Committee whichever is more.
		4. No river / stream bed mining shall be allowed within 1/10th of its span or 5 meters from the banks or as specified by the Sub-Divisional Level Committee, whichever is more.
		5. Nor river / stream bed mining shall be allowed within 200 meters upstream and downstream of water supply scheme or as specified by the Committee whichever is more.
		6. Nor river / stream bed mining shall be allowed within 200 meters upstream and 200 to 500 meters downstream of bridges depending upon the site specific conditions.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	DESCRIPTION OF BEST PRACTICES
		7. No approach road from PWD road shall be allowed to lease area unless lessee / contractor obtains written permission from XEN, PWD for making road leading to all intake places from the PWD road. 8. No boulders/ cobbles/ hand broken road ballast shall be allowed to be transported outside the State from river/stream beds. 9. No digging for more than 3 feet shall be allowed in river/ stream beds. 10. No blasting shall be allowed in river/stream beds.
05	Madhya Pradesh	1. In some districts the Cooperative Societies of Labour are doing the sand collection, loading and unloading work.
06	Tamil Nadu	Permission has been granted in favour of PWD for quarrying sand in the river Poramboke lands in 16 districts in the state of Tamil Nadu. Sand mining is being carried out by the PWD in the entire State.
07	Uttar Pradesh	U.P. Minor Mineral Concession Rules, 1963.

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE - 8

STATUS OF PROMULGATION OF RULE ON SAND MINING IN THE STATE / UT

Sl.No.	STATE / U.T	NAME OF RULE WITH YEAR OF PROMULGATION
01	Andaman & Nicobar	Indian Forest Act, 1927 as sand has been included as forest produce.
02	Arunachal Pradesh	APMMCR 2002 and made effective from 1.01.2003
03	Himachal Pradesh	1. River/Stream bed Mining Policy-2004.
		2. Himachal Pradesh Minor Mineral Policy-2013.
		3. Himachal Pradesh Minor Mineral (Concession) and Mineral (Prevention of illegal mining, transportation and storage) Rule, 2015.
04	Jharkhand	Rule 12 of Jharkhand Minor Mineral Concession (Amendment) Rule 2014.
05	Karnataka	Karnataka Sand Policy was brought out in the year 2011 and as such amendment to the Karnataka Minor Mineral Concession Rule 1994 were made in the year 2011 and a separate chapter IV B for sand mining was introduced under Rule 31-R. Further, as per the Hon'ble Supreme Court orders sated 27.02.2012 in SLP No. 19628-19629 between Deepak Kumar and State of Haryana and others and as per the model Guideliness issued by the Government of India for Environmental Management of Mining of Minor Minerals, amendment to the Karnataka Minor Mineral Concessions Rule 1994 were brought out on 16.12.2013 incorporating a new chapter II A applicable to all minor minerals on Systematic, Scientific Mining and Protection of Environment, wherein Quarrying Plan, Environmental Management Plan and Environment Clearance was made mandatory. Amendments to Rule 31- R were also made wherein the Government, PWD Department was entrusted with sand mining, storage and transportation, under the District Sand Monitoring Committee and Taluk Sand Monitoring Committee.
06	Madhya Pradesh	Rules have been framed as per the orders of Hon'ble Supreme Court for sand mining under M.P. Minor Mineral Rules 1996 and Sand Mining Policy 2015 is also formulated in the State.

* States/UTs not mentioned have not provided the data.

Sl.No.	STATE / U.T	NAME OF RULE WITH YEAR OF PROMULGATION
07	Meghalaya	No rules notified by the state on sand mining
08	Mizoram	Mizoram Forest Act, 1955, which came into force on 1.01.1956.
09	Puducherry	Puducherry Minor Minerals (Concession) Rules, 1977.
10	Rajasthan	RMMCR, 1986 Notification dated 2.11.2012: 1. First proviso of Rule 8(2) and first proviso of 17 (1) - Renewal of Bajari Mining Leases is not allowed. 2. Rule 16 (3) - Mining Leases of Bajari to be granted for 5 years. 3. Rule 18 (18) - Part surrender of lease area of Bajari not allowed. Notification dated 3.4.2013 - (First proviso Rule 7 (1)- Mining leases of Bajari to be granted only by way of tender or auction. Notification dated 12.07.2013 - (First proviso Rule 11 (2)) - Maximum area limit of 10 sq. km. not applicable for Bajari Mining Leases. Bikaner District: Chapter II of RMMCR, 1986 (last amended 12.07.2013).
11	Sikkim	Sikkim Forest (Allotment of Areas for Quarrying of Sand and Stone), 2006.
12	Tamil Nadu	1. As per G.O. Ms. No. 95 Industries (MMCI) Department dated 1.10.2003, a new Rule 38 A has been introduced in the Tamil Nadu Minor Mineral Concession Rules, 1959. Accordingly quarrying and sale of sand is being carried out by PWD in the state of Tamil Nadu since October 2003. 2. As per G.O. Ms. No. 158 Industries (MMIC) Department dated 25.08.2008, a new Rule 38 B has been introduced in the Tamil Nadu Minor Mineral Concession Rules, 1959. Accordingly transportation of sand outside the state not to be made. To regulate storage and transportation of sand a new Rule 38 C B has been introduced in the Tamil Nadu Minor Mineral Concession Rules, 1959 vide G.O. No. 32 Industries (MMIC) Department dated 11.02.2011.

* States/UTs not mentioned have not provided the data.

APPENDIX: TABLE -9

NORMAL DATES OF ONSET AND WITHDRAWAL OF SOUTH-WEST MONSOON

The India Meteorological Department, Nagpur, vide letter No. NAGPUR RMC /CS-312, dated 18th January,2016 has provided the period of Rainy Season viz. Normal dates of Onset and Withdrawal of Southwest Monsoon over India as state-wise and union territory- wise which are as below:-

States	Normal date of Onset of SW-Monsoon	Normal date of Withdrawal of SW-Monsoon
Andhra Pradesh	1st June	15th October
Arunachal Pradesh	5th June	15th October
Assam	5th June	15th October
Bihar	10th June	15th October
Chhattisgarh	10th June	15th October
Goa	5th June	15th October
Gujarat	15th June	15th September
Haryana	1st July	15th September
Himachal Pradesh	1st July	15th September
Jammu & Kashmir	1st July	15th September
Jharkhand	10th June	15th October
Karnataka	5th June	15th October
Kerala	1st June	15th October
Madhya Pradesh	15th June	1st October
Maharashtra	10th June	1st October
Manipur	1st June	15th October
Meghalaya	1st June	15th October
Mizoram	1st June	15th October
Nagaland	5th June	15th October
Odisha (Orissa)	5th June	15th October
Punjab	1st July	15th September
Rajasthan	1st July	1st September
Sikkim	5th June	15th October
Tamil Nadu	1st June	15th October
Telangana	5th June	15th October
Tripura	1st June	15th October

States	Normal date of Onset of SW-Monsoon	Normal date of Withdrawal of SW-Monsoon
Uttar Pradesh	15th June	1st October
Uttarakhand	15th June	1st October
West Bengal	10th June	15th October
Union territory	**Normal date of Onset of SW-Monsoon**	**Normal date of Withdrawal of SW-Monsoon**
Andaman and Nicobar Islands	20th May	15th October
Dadra and Nagar Haveli	10th June	1st October
Daman and Diu	10th June	1st October
Lakshadweep	1st June	15th October
Delhi	1st July	15th September
Puducherry	1st June	15th October

Note: The District Environment Impact Assessment Authority (DEIAA) in consultation with District Expert Appraisal Committee (DEAC) can make necessary changes as per local meteorological variations in this period of rainy season with respect to prohibition of River Sand Mining in the District.

ENSURING SUSTAINABLE SAND MINING FOR SUSTAINABLE DEVELOPMENT

A Major Initiative of Ministry of Environment, Forest and Climate Change for ensuring Environmentally Sustainable Sand Mining and Prevention of illegal Sand Mining.

{Notification No: SO No. 141 (E) dated 15.01.2016 and S.O. No. 190 (E) dated 20.01.2016 available at www.envfor.nic.in}

- Use of Satellite imagery to decide the site suitable for mining and quantity of sand which can be mined.
- Transit permit with tamper proof security features and tracking of mined out mineral.
- Monitoring of mined out mineral to prevent mining in excess of environmental clearance capacity.

- Delegation of power to grant environmental clearance for sand mining to an authority headed by District Magistrate.

- Intergration of power with District Authorities to grant environmental clearance and prevent illegal mining.

Note : Any information of mining without environmental clearance or against the norms prescribed in these notifications be reported at e-mail id: sandmining-moef@gov.in

Annexure-IV

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

PRINCIPAL BENCH, NEW DELHI

ORIGINAL APPLICATION NO. 360/2015

IN THE MATTER OF:-

NATIONAL GREEN TRIBUNAL BAR ASSOCIATION **APPLICANT(S)**

VERSUS

VIRENDRA SINGH (STATE OF GUJARAT) **RESPONDENT(S)**

INDEX

NAZIMUDDIN
SCIENTIST 'E'
CENTRAL POLLUTION CONTROL BOARD
PARIVESH BHAWAN, EAST ARJUN NAGAR,
DELHI- 110032

PLACE: - DELHI
DATED: - 30.01.2020

Recommendations on Scale of Compensation to deal with the cases of illegal sand mining

Submitted to

Hon'ble National Green Tribunal,

Principal Bench, New Delhi

(Submitted by the Committee constituted in the matter of Hon'ble NGT OA No. 360 of 2015 order dated-05.04.2019)

29th January 2020

2

INDEX

1. Introduction

The mining operation has its consequence on the environment. The sand mining operation has traditionally been carried out manually in river both in-stream and in flood plain, coastal and paleo channels, but with advent of time the method of mining has changed to semi-mechanised and mechanised. The use of machinery in riverbed mining may impact the river environment to great extent depending on the scale of operation.

It is estimated that more than 35 million people are employed in sand business, and economic valuation is well over $126 billion per annum (Ref: NGT order dated 05.04.2019 in O.A. 360/2015). The illegal sand mining has been rampant in different states of the country and the protection of environment from the impacts of unregulated sand mining has been a challenge to regulatory bodies.

The Hon'ble NGT (Principal Bench), New Delhi by order dated-05.04.2019 in O.A. No. 360/2015 (13 clubbed cases) related to illegal sand mining from riverbeds in different states, constituted a Committee comprising of representatives of Ministry of Environment, Forest and Climate Change, Government of India (MoEF&CC), Central Pollution Control Board (CPCB), Indian Institute of Forest Management – Bhopal (IIFM), Institute of Economic Growth - New Delhi (IEG) and Madras School of Economics (MSE) *"to prepare a scale of compensation, after including the components mentioned in the order, which can then be adopted in whole of country. The nodal agency for compliance and coordination is CPCB. The committee may also take professional service of an expert / institution in the matter if it so desires."*

In view of Hon'ble NGT (PB) order dated 05.04.2019 in O.A. No. 360/2015 (13 clubbed cases), this report has been prepared to suggest a scale of compensation to deal with cases of illegal sand mining in whole of country.

4

2. Constitution of Committee

In compliance of the above order, the Nodal Agency (CPCB) issued office order dated 22.05.2019 regarding constitution of the committee of the members based on the nominations received from the concerned organisations as follows:

1. Dr Purnamita Dasgupta, Professor, IEG, Delhi
2. Dr K.S. Kavi kumar, Professor, MSE, Chennai
3. Dr. Yogesh Dubey, Associate Professor, IIFM, Bhopal
4. Shri Sundeep, Director, MoEF&CC, Delhi
5. Shri A. Sudhakar, Additional Director, CPCB, Delhi

Meetings of the committee were convened on 31.05.2019, 20.06.2019, 24.07.2019, 16.09.2019 and 11.12.2019 to arrive at a scale of compensation based on inputs of subject experts and available resource to deal with the matter of illegal mining. The minutes of the meetings are annexed at **Annexure I**. Inputs received from experts are annexed at **Annexure II to IV.**

3. Impacts due to Illegal Sand Mining

3.1 Framework for a Compensation Scale

A framework for assessing the value of ecological damage due to illegal sand mining is developed taking into consideration the following dimensions:

- Extent of Illegal Mining: It must be recognised that in any given geographic area the ecological impacts will be felt from all mining that takes place in the relevant region (or that within which the water body concerned is located). Hence, ideally, a landscape has to be considered for estimating the ecological damages in their entirety. However, this may practically pose several data and information challenges. Sometimes the ecological processes are also uncertain. Therefore, the objective in the current context would be to establish a practical approach of estimating the extent of 'illegal' mining, assuming that the legally permitted mining takes into account the sustainable ecological limits within which such mining should be restricted. For present purposes, to fix individual liability, this may be done by making an assessment of the total extraction through sand mining being carried out and netting out the amount for which environmental clearance has been given.
- Restoration of ecology: It is acknowledged at the outset that in practise, full restoration of nature in its pristine form is next to impossible. However, the reality of ongoing economic activities causing ecological damages implies that the adoption of the polluter pays principle can be a way ahead for raising the resources for undertaking restoration activity to the maximum extent possible. At the same time, some of the foregone ecosystem services (and hence values associated with these) will improve gradually over the years as the riverine ecosystem gets restored.
- Ecological damages associated with mining -Ideally, each river or water body which is affected by such mining should have an independent assessment of the extent of ecological damages which would be specific to its context.

6

- Interim approach - In the absence of such information, or in the interim till such studies are carried out, two alternative ways of operationalizing a compensation scale to cover the ecological costs associated with illegal sand mining are developed. One approach uses a deterrence factor as a proxy for capturing non-linearities associated with ecological damages, the other uses a simplified Net Present Value approach. A comparison of the two is provided with an illustration.
- Rationale for scale of compensation: In both approaches, the damage assessment is based on the material cost of the illegal sand, interacting it with the ecological risks associated with it. The underlying assumption is that the feasible limits within which sand mining can be allowed without de-stabilising the ecological conditions have been taken into account while setting the legally permitted quantity for extraction. Mining beyond this is illegal and causes trade-offs between this particular provisioning service of the river (sand flow) and its supporting and regulating (and other provisioning) services which thereby get affected, constituting ecological damages. The compensation would comprise of the material cost of the illegally mined sand and foregone ecological values, while keeping in mind the objective of restoration.
- Finally, it is noted that the concerned authority shall take appropriate action under the provision of applicable Acts/ Rules, whenever any illegal or non-complying mining activities is observed. The proposed environmental compensation suggested in this recommendation will be in addition to the requirement of any such action.

7

3.2 Determination of Net Present Value (NPV)

Computation of the NPV requires both scientific and socio-economic data and application of state-of-the-art methodology. The most appropriate valuation will be context specific for both scientific and socio-economic considerations. Some of the physical and environmental factors include the following: (morphological changes, changes in settlement and habitation patterns, river bank slope, tidal activity, etc.). Hence, the actual compensation will vary across riverine systems. Therefore, each state and river and related development authority should make efforts to estimate the NPV applicable over the next 5 years.

Various definitions of NPV have been used in the context of the environment (United Nations, 2000, Chopra et al 2006, US EPA 2014, etc.). As per the Chopra Committee in the context of forests, the NPV refers to "the discounted sum of rupee values of eco-system goods and services that would flow from a forest over a period of time net of costs incurred." It is thus not meant to capture the value of the forest wealth as such, but only the flow of goods and services from it. In the context of the diversion of forest land to non forestry use, NPV is interpreted by the committee as the loss of value of the forest resources to the stakeholders as at the time of the diversion for non-forest use. It excludes any values that may accrue or get created by the user agency who uses it for non-forest purposes (See, Page 9 of Chopra, Kadekodi, & Eswaran, 2006). The range of services considered in such a case can include timber, carbon storage value, fuel wood and fodder, non-timber forest products, watershed services, and so on. Actual estimates of such NPV have also been worked out for specific forest circles and levied by state departments*

The benefits from avoiding the ecological damages to riverine ecosystems could range from recreation activities, aesthetics, wildlife viewing, fishing, boating, swimming, supporting and regulating services such as climate moderation, flood moderation, groundwater recharge, sediment trapping, soil retention, nutrient cycling, biodiversity, genetic library, water filtration, soil fertilization, species preservation, and many other non-use and intangible values. However, it is difficult to conceptualize current or future benefits to the ecology from mining activity since

8

the pristine condition of the river basin (or affected ecosystem) would be considered to be the most desirable condition from the assessment's point of view. However, estimating the true value of all these benefit components which may be harmed by mining activity is not possible at this stage due to a variety of reasons, such as lack of data or information on such aspects, the non-market functions and complexities of the science involved. In particular, these values are extremely contextual in nature and therefore, we assume that the current condition has been reflected accurately in the legally permitted level of mining. Using this as a basic premise, a compensation formula is proposed as described in Section 4, to capture the NPV.

In the context of the assessment of ecological damages arising from sand mining, the NPV is thus considered to be the present value of the current and future stream of net costs of such activity. The rationale lies in recognizing that there may be negative externalities or ecological damages that result from excessive mining which manifests itself in a loss of the ecosystem services of rivers, and creates a loss of well being for both current and future generations. The extent of damage and the scope for restoration will vary from site to site, and will depend on a variety of biophysical and man-made characteristics.

Till such time as site specific assessments of the river systems are carried out, a compensation scale maybe proposed as suggested in Section 4 below.

*References:

Verma, M., Negandhi, D., Wahal, A., Kumar, R., Kinhal, G., & Kumar, A. (2014). Revision of rates of NPV applicable for different class/category of forests. Bhopal: Indian Institute of Forest Management. Retrieved from http://iifm.ac.in/wp-content/uploads/2016/06/IIFM_NPV_07NOV.pdf

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forests: issues in modelling, and an illustration. The International Forestry Review, 10(2), 376-386. Retrieved from https://www.jstor.org/stable/43740351

CEC (Central Empowered Committee). (2007). Supplementary report in IA No.826 in IA No.566 regarding calculation of Net Present Value(NPV) payable on use of forest land of different types for non-forest purposes. Retrieved from https://www.prsindia.org/sites/default/files/bill_files/bill185_20080723185_Central_Empowered_Committee_Guidelines.pdf

4. Recommendations on Scale of Compensation

As discussed earlier, the full economic value for compensation should be as per the Net Present Value. As legal and illegal mining proceeds usually either in conjunction or in sequential manner, the ecological impacts of mining will take place irrespective of whether it is legal or illegal. The attribution to illegal mining, of a specific impact at the landscape level, will require careful evaluation. Till such information becomes available, two alternative approaches for compensation are proposed keeping in mind the various dimensions of the TOR for this committee.

4.1 Approach 1: Direct Compensation based on the market value of extraction, adjusted for ecological damages

A scale for calculation of the compensation to be charged has been worked out as provided in the Table No. 01. The compensation to be charged is based on three distinct criteria:

Exceedance Factor (EF): This criteria captures the extent of illegal mining that has taken place. It is introduced in order to bring in a notion of balance that the amount of penalty that is charged to any party is in proportion to the extent of illegal extraction of material at the first stage.

Risk Factor (RF): This criteria reflects the severity of the ecological damages at the field site in question. It is an attempt to capture the fact that there is likely to be substantial variation in the ecological conditions and resultant damages across sites where illegal mining takes place. It is reasonable therefore to introduce a risk factor that accounts for the extent of severity of damages using a four-point scale of mild, moderate, significant and severe risk. Till the time that detailed basin level studies are carried out, this risk factor can be judged on the basis of the state department's assessment of the ecological fragility of the river basin concerned based on a priori knowledge of the circumstances.

Deterrence Factor (DF): This criteria is an attempt to capture the fact that ecological damages tend to display non-linearities and can increase in unexpected ways. Thus, the greater the extent of extraction (as reflected in the relative magnitude of the illegally extracted amount), the greater is the likelihood that this may have cumulative impact over time, which may not be observable at the time of assessment (as reflected in the RF). Given that the scale should also have a deterrence effect, this criteria is introduced to proxy for these non-linear aspects till such time that more site specific data becomes available to carry out a comprehensive NPV.

Table No. 01: Approach 1				
Permitted Quantity (in MT or m^3)	**Total Extraction (in MT or m^3)**	**Excess Extraction (in MT or m^3)**	**Exceedance in Extraction:**	**Compensation Charge (in Rs.)**
X	Y	Z = Y-X	Z/X	D * (1+RF + DF) Where D = Z x Market Value-of-the-material-per-MT-or-m^3
				DF = 0.3 if Z/X = 0.11 to 0.40 DF = 0.6 if Z/X = 0.41 to 0.70 DF = 1 if Z/X >= 0.71
				RF = 0.25, 0.50. 0.75, 1.00 (as per table 2)

Note:

a) The inspecting team will consider the error in measurement of quantity of material (maximum 10% for up to 5 Ha. sites but should be less for large sites) and accordingly decide/recommend whether any particular case is fit for imposing compensation for damages or not.

b) Market Value of the material per (MT or m^3) will be based on applicable market price of the mined material.

c) **Risk Factor (RF)** to take value as per the Risk Level of the illegal mining case, as below:

Table No. 02				
Risk Level	1	2	3	4
Risk Factor	0.25	0.50	0.75	1

d) **Risk Level** to take value as per the severity of the impacts of illegal mining case, as below:

Table No. 03				
Severity of Impact	Mild	Moderate	Significant	Severe
Risk Level	1	2	3	4

e) **Severity of impact** of illegal mining case to be categorised as Mild or Moderate or Significant or Severe for various components of the river and highest value to be used:

Table No. 04				
S. No.	River Component	Impacts	Impacts (Sub -category)	Severity of impact/ Risk Factor
1.	Morphology	Instability of Channel geometry	Bed degradation	
			Channel adjustment	
			Bank Erosion	
2.	Hydrology	Ground Water level	Change of ground water table in adjacent areas	
		Change in river flow	Variation in flow energy	
3.	Ecology	Loss of local Ecological community	Disturbance to flora	
			Disturbance to fauna	
4.	River Structures	Instability to Hydraulic Structure	Damage to Hydraulic Structure and its surrounding	
5.	Any Other			

Deriving the Risk Factor (RF): Some criteria can be considered by states for judging the risk factor applicable at various sites. Accordingly, States may develop a subjective scale for severity of impact (Risk Factor–RF) for purposes of implementing the interim compensation scale based on any 3 of the 4 heads listed in TableNo.04 through expert consultation over the period of next 3 months. Till such criterion/guidelines is prepared by states the inspections team may decide RF based on its own assessment.

12

4.2 Approach 2: Computing a Simplified NPV for ecological damages

Till such time as data and information for a comprehensive NPV is worked out in a site specific manner to account for all (or atleast the major) ecological damages, a simplified NPV, proxied on the market value of the illegally extracted amount maybe computed. In this case the NPV approach would imply that **the total benefits from the activity of sand mining (as represented by the market value of the extracted amount) be deducted from the total ecological costs** imposed by the activity. In the absence of data on benefits and costs separately, we recommend a modification of the formula as shown below.

Total Benefits (B) = Market Value of illegal extraction : D (refer Table 1)

Total Ecological Costs (C) = Market Value adjusted for risk factor: D * RF (refer Table 1).

For present purposes, it is assumed that the Benefits would accrue only in the first year (in which the extraction of the illegally mined material takes place), while the ecological costs would continue to be felt over a period of time. NPV is to be calculated for a period of 5 years on the net value, **$\sum$(C-B)**, at a discount rate ranging from **8%-5%**, varying in inverse with the risk factor. Thus, where the highest risk factor (say 1) is applicable, the discount rate applicable would be the lowest (say 5% in this case).

Thus, it is recommended that the annual net present value (NPV) of the amount arrived at after taking the difference between the costs and the benefits through the use of the above approach, maybe calculated for a period of 5 years at a discount rate of 5% for mining which is in a severe ecological damage risk zone. The rationale for levying this NPV is based on expert opinion that reversal and/or restoration of the ecological damages is usually not possible within a short period of time and rarely is it feasible to achieve 100% restoration, even if the sand deposition in the river basin is restored through flooding in subsequent years. The negative externalities of the mining activity are therefore to be accounted for in this manner. Ideally, the worth of all such damages, including costs of those which can be restored should be charged. However, till data on site-specific assessments becomes available, this approach maybe adopted in the interim. In situations where the risk categorisation

13

charged. However, till data on site-specific assessments becomes available, this approach maybe adopted in the interim. In situations where the risk categorisation is unavailable or pending calculation, the following Discount Rates may be considered:

Severity	Mild	Moderate	Significant	Severe
Risk Level	1	2	3	4
Risk Factor	0.25	0.50	0.75	1.0
Discount Rate	8%	7%	6%	5%

14

Basis of recommending 5 % Discount Rate

It is to be noted that the choice of a discount rate varies widely across countries and further, by the type of project or purpose. The rate used in developing countries in general is usually found to be higher, with social discount rates varying from 8 to 15% (Jhuang et al 2007, Murty et al 2018). The Government of India has issued guidelines for parameters (discount rates) and processes for project appraisal periodically. The national parameters for project appraisal in operation since 1994, for instance stipulated that projects had to yield a minimum of 12% financial and economic internal rate of return for the purpose of investment approval. Recently these were re-examined in a study, and in keeping with the growth of income in the economy an estimate of 8 per cent for the rate of discount for investment project appraisal in India was suggested (Murty et al 2018). In India, The Kanchan Chopra committee report on NPV recommends a 5% discount rate. The specific sentence from this report is that - "Considering the fact that forest resources provide long term goods and services and ecosystem benefits and, interest rates in India are going down, the Committee recommends a 5% social discount rate for forest resources." Several other studies in India and abroad for projects with implications for forests, water utilities, health and sanitation, and other such social, environmental or public sector projects, have used similar rates of discount ranging from 5 to 8% (Puroshothaman et al 2000, Dasgupta et al 2019, Chopra and Dasgupta 2008, Simpson 2008). Further, it is recommended that rates of interest should ideally decline and be lower, where there are uncertainties about the future, and/or in case of climate mitigation and environmental management projects where the benefits are likely to accrue over a longer time period (Weitzman 2001, Gollier 2012). For India, the suggested rate was between 8%-5% for such environment related projects. Thus, the suggested rate of discount in this report draws upon these studies. Lower "discount rate" means that compensation amount will be more.

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15

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16

Annexure – A

Examples

For ease of understanding the calculation of compensation, possible scenario of illegal mining are given below.

Example 01: Violation with respect to Area

A case of non-compliance in terms of excess area was reported. The inspection team carried out an assessment of mining site and observed severity of impacts on river components as *Severe*, then the computation of Compensation Charge will be as follow:

Compensation Charged (Scenario I – no explicit accounting of NPV)

Violation reported as follow:

Total Permitted Quantity in Environmental Clearance (X)	=30000 m^3
Total Area of mined out mineral	=15000 m^2
Total Permitted Area in Environmental Clearance	=10000 m^2
Excess Mined out area	=5000 m^2
Total Depth permitted as in Environmental Clearance	=3 m
Excess extraction (Z)	=5000 x 3 = 15000 m^3
Exceedance Factor (Z/X)	=15000/30000=0.5

Methodology:

Market Value of Illegally Mined Material (D) (assuming Market Value of the material as Rs. 400/- per m^3)	D = 15000 x 400 = 6000000/-
Risk Factor (RF)	Severity *Severe* Risk Level 4 Risk Factor (RF) 1
Deterrence Factor (DF)	DF = 0.6 (for Z/X in 0.41 to 0.70 range)
Compensation	=D x (1+RF+DF)
Total (in Rs.)	=6000000/- x (1+1+0.6) =Rs.1,56,00,000/-

17

Compensation Charge (Scenario II – explicit accounting of NPV)

Market Value of Illegally Mined Material (D) 5000*400 = 6000000/-

Annual Value of Foregone Ecological Values D*RF = 6000000/-

- **Present Value of Foregone Ecological Values (@ 5% discount rate and over 5 years)**

$$PV = \sum_{t=1}^{5} \frac{(D*RF)}{(1+r)^t}$$

$$= \sum \frac{(6000000)}{(1+0.05)^1} + \frac{(6000000)}{(1+0.05)^2} + \frac{(6000000)}{(1+0.05)^3} + \frac{(6000000)}{(1+0.05)^4} + \frac{(6000000)}{(1+0.05)^5}$$

= Rs. 2,59,76,860/-

- Net Present Value (after netting out market value of illegally mined material) – i.e., Total Compensation to be levied

= NPV = PV - D

= Rs. 1,99,76,860/-

Compensation Charge in above case:

Approach 1 (no explicit accounting of NPV)	**Approach 2 (explicit accounting of NPV)**
D*(1+RF+DF)	**@ 5% discount rate and over 5 years**
Rs. 1,56,00,000/-	Rs. 1,99,76,860/-

18

Example 02: Violation with respect to Depth

A case of non-compliance in terms of excess depth was reported. The inspection team carried out an assessment of mining site and observed severity of impacts on river components as *Severe*, then the computation of Compensation Charge will be as follow:

Compensation Charge (Scenario I – no explicit accounting of NPV)

Violation reported as follow:

Total Permitted Quantity in Environmental Clearance (X)	=30000 m^3
Total Permitted Area in Environmental Clearance	=10000 m^2
Total Depth of mined out material	=4 m
Total Permitted Depth in Environmental Clearance	=3 m
Total Violation in Depth	=1 m
Excess Extraction (Z)	=10000x 1 =10000 m^3
Exceedance Factor (Z/X)	=10000/30000=0.33

Methodology:

Market Value of Illegally Mined Material (D) (assuming Market Value of the material as Rs. 400/- per m^3)	D = 10000 x 400 = 4000000/-
Risk Factor (RF)	Severity *Severe* Risk Level 4 Risk Factor (RF) 1
Deterrence Factor (DF)	DF = 0.3 (for Z/X in 0.11 to 0.40 range)
Compensation	=D x (1+RF+DF)
Total (in Rs.)	=4000000/- x (1+1+0.3) =Rs 92,00,000/-

19

Compensation Charge (Scenario II – explicit accounting of NPV)

Market Value of Illegally Mined Material (D) 10000*400 = 4000000/-

Annual Value of Foregone Ecological Values D*RF = 4000000/-

- **Present Value of Foregone Ecological Values (@ 5% discount rate and over 5 years)**

$$PV = \sum_{t=1}^{5} \frac{(D*RF)}{(1+r)^t}$$

$$= \sum \frac{(4000000)}{(1+0.05)^1} + \frac{(4000000)}{(1+0.05)^2} + \frac{(4000000)}{(1+0.05)^3} + \frac{(4000000)}{(1+0.05)^4} + \frac{(4000000)}{(1+0.05)^5}$$

= Rs. 1,73,17,907/-

- Net Present Value (after netting out market value of illegally mined material) – i.e., Total Compensation to be levied

= NPV = PV - D

= Rs. 1,33,17,907/-

Compensation Charge in above case:

Approach 1 (no explicit accounting of NPV)	**Approach 2 (explicit accounting of NPV)**
D*(1+RF+DF)	**@ 5% discount rate and over 5 years**
Rs. 92,00,000/-	Rs. 1,33,17,907/-

20

Example 03: Violation with respect to Depth and Area

A case of non-compliance in terms of excess depth and area was reported. The inspection team carried out an assessment of mining site and observed severity of impacts on river components as *Severe*, then the computation of Compensation Charge will be as follow:

Compensation Charge (Scenario I – no explicit accounting of NPV)

Violation reported as follow:

Total Permitted Quantity in Environmental Clearance (X)	=30000 m^3
Total Permitted Area in Environmental Clearance	=10000 m^2
Total Permitted Depth in Environmental Clearance	=3 m
Total Area of mined out material	=12000 m^2
Total Depth of mined out material	=4 m
Total Volume of mined out material	=12000 m^2 x 4 m =48000 m^3

(The example can be applied to a case of totally illegal mining without EC also where illegal mining of 18000 m^3has been done)

Excess Extraction (Z)	=18000 m^3
Exceedance Factor (Z/X)	=18000/30000=0.6

Methodology:

Market Value of Illegally Mined Material (D) (assuming Market Value of the material as Rs. 400/- per m^3)	D = 18000 x 400 = 7200000/-
Risk Factor (RF)	Severity *Severe* Risk Level 4 Risk Factor (RF) 1
Deterrence Factor (DF)	DF = 0.6 (for Z/X in 0.41 to 0.70 range)
Compensation	=D x (1+RF+DF)
Total (in Rs.)	=7200000/- x (1+1+0.6) =Rs 1,87,20,000/-

21

Compensation Charge (Scenario II – explicit accounting of NPV)

Market Value of Illegally Mined Material (D) 18000*400 = 7200000/-

Annual Value of Foregone Ecological Values D*RF = 7200000/-

- **Present Value of Foregone Ecological Values (@ 5% discount rate and over 5 years)**

$$PV = \sum_{t=1}^{5} \frac{(D*RF)}{(1+r)^t}$$

$$= \sum \frac{(7200000)}{(1+0.05)^1} + \frac{(7200000)}{(1+0.05)^2} + \frac{(7200000)}{(1+0.05)^3} + \frac{(7200000)}{(1+0.05)^4} + \frac{(7200000)}{(1+0.05)^5}$$

= Rs. 3,11,72,232/-

- Net Present Value (after netting out market value of illegally mined material) – i.e., Total Compensation to be levied

= NPV = PV - D

= Rs. 2,39,72,232/-

Compensation Charge in above case:

Approach 1 (no explicit accounting of NPV)	**Approach 2 (explicit accounting of NPV)**
D*(1+RF+DF)	**@ 5% discount rate and over 5 years**
Rs. 1,87,20,000/-	Rs. 2,39,72,232/-

22

Example 04: Violation with respect to Quantity / Production

A case of non-compliance in terms of excess quantity/production was reported. The inspection team carried out an assessment of mining site and observed severity of impacts on river components as *Severe*, then the computation of Compensation Charge will be as follow:

Compensation Charge (Scenario I – no explicit accounting of NPV)

Violation reported as follow:

Total Volume of mined out material	=35000 m^3
Total Permitted Quantity in Environmental Clearance (X)	=30000 m^3
Excess Extraction (Z)	=5000 m^3
Exceedance Factor (Z/X)	=5000/30000 = 0.16

Methodology:

Market Value of Illegally Mined Material(D) (assuming Market Value of the material as Rs. 400/- per m^3)	D = 5000 x 400 = 20,00,000/-
Risk Factor (RF)	Severity *Severe* Risk Level 4 Risk Factor (RF) 1
Deterrence Factor (DF)	DF = 0.3 (for Z/X in 0.11 to 0.40 range)
Compensation	=D x (1+RF+DF)
Total (in Rs.)	=2000000/- x (1+1+0.3) =Rs. 46,00,000/-

23

Compensation Charge (Scenario II – explicit accounting of NPV)

Market Value of Illegally Mined Material (D) 5000*400 = 2000000/-

Annual Value of Foregone Ecological Values D*RF = 2000000/-

- **Present Value of Foregone Ecological Values (@ 5% discount rate and over 5 years)**

$$PV = \sum_{t=1}^{5} \frac{(D*RF)}{(1+r)^t}$$

$$= \sum \frac{(2000000)}{(1+0.05)^1} + \frac{(2000000)}{(1+0.05)^2} + \frac{(2000000)}{(1+0.05)^3} + \frac{(2000000)}{(1+0.05)^4} + \frac{(2000000)}{(1+0.05)^5}$$

= Rs. 86,58,953/-

- Net Present Value (after netting out market value of illegally mined material) – i.e., Total Compensation to be levied

= NPV = PV - D

= Rs. 66,58,953/-

Compensation Charge in above case:

Approach 1 (no explicit accounting of NPV)	**Approach 2 (explicit accounting of NPV)**
D*(1+RF+DF)	**@ 5% discount rate and over 5 years**
Rs. 46,00,000/-	Rs. 66,58,953/-

24

Annexure I

Deliberations in the Meetings of the Committee

First meeting of the committee

The first meeting of the member of the committee constituted by the Hon'ble NGT in O.A. No. 360/2015 order dated 05.04.2019 was convened on 31.05.2019 at CPCB, Delhi. The committee meeting was attended by the following members:

1. Shri Sundeep, Director, MoEF&CC, Delhi
2. Shri A. Sudhakar, Additional Director, CPCB, Delhi
3. Dr. Yogesh Dubey, Associate Professor, IIFM, Bhopal
4. Dr Purnamita Dasgupta, Professor, IEG, Delhi

The member, Dr. K.S. Kavi Kumar, Professor, MSE, Chennai was not able to attend the meeting due to unavoidable circumstances.

The members of the committee expressed the opinion that assessment of the damage and net present value of eco-system services forgone forever and the cost of mitigation and restoration are the most important elements to arrive at a scale of Environmental Compensation and it is necessary to hear views of experts on these subjects in a workshop.

Second Meeting of the Committee

As desired by the committee in the first meeting, the following institutes / experts were requested for participation in a one-day workshop and to provide their views/opinion:

Expert Institutes:

- Forest Research Institute, Dehradun
- Indian Institute of Soil and Water Conservation, Dehradun
- National Institute of Hydrology, Roorkee
- Indian Institute of Technology Delhi
- Indian Institute of Technology, Roorkee
- Wildlife Institute of India, Dehradun
- Zoological Survey of India, Kolkata

Individual Experts:

- Dr. C.R. Babu, Professor Emeritus, University of Delhi
- Dr. Jagdish Krishnaswamy, Senior Fellow, Suri Sehgal Centre for Biodiversity and Conservation, Bangalore

25

The second meeting cum workshop was convened on 20.06.2019 at CPCB, Delhi to hear the views of the subject experts. The meeting cum workshop was attended by following member of committee and subject experts:

Committee Members:

1. Shri Sundeep , Director, MoEF&CC, Delhi
2. Shri A. Sudhakar, Additional Director, CPCB, Delhi
3. Dr Purnamita Dasgupta, Professor, IEG, Delhi

Dr. K.S. Kavi Kumar, Professor, MSE, Chennai and Dr. Yogesh Dubey, Associate Professor, IIFM, Bhopal were unable to attend the meeting cum one-day workshop due to other works.

Subject Experts

Dr. C. R. Babu, Professor Emeritus, University of Delhi
Dr. Zulfiqar Ahmad, Professor, IIT Roorkee
Dr. C. Raghunathan, Scientist E, Zoological Survey of India, Kolkata
Dr. Sumant Kumar, Scientist C, National Institute of Hydrology, Roorkee

Views of Subject Experts:

Professor Zulfiqar Ahmad, IIT Roorkee expressed his view on assessment of physical damage caused in the river due to mining and shared the case studies on morphological changes in the river and its likely impacts. The study comprised of identification of critical reach of river, measures suggested to protect the critical reach, and the cost required for restoration of the physical damages occurred. Other aspects for assessment included the change in the stability of slope and structure in the river stretch. He expressed that assessment of physical damages needs to be done through comprehensive case specific study. He highlighted that mining activities done even at long distance from a civil structure may result in ultimate lowering of the bed by head cutting in upstream due to movement of nick point as well as cutting/degradation in downstream from the mining site. (*Power Point Presentation enclosed*)

Dr C.R. Babu, Professor Emeritus, University of Delhi provide a detailed note on the matter describing types of sand mining and adverse impacts of sand mining which was circulated to committee members and other experts (**copy enclosed**). He said that mining activity lead to channel incision, erosion of riverbed and vertical instability, results in shallowing and widening of channel and multiple channel of river from one channel. The shallowing of channel causes increase in temperature, affecting local fish population, fish diversity and vegetation in riparian zone. The deepening of riverbed due to depletion of material impacts on existing dug well / tube well and underground water, changes the water quality and reduces the

sediment deposits which serves as substratum for vegetation and habitats for riparian and terrestrial species. He agreed to attend any future committee meeting as a special invitee and provide his expert views.

Dr. Sumant Kumar, Scientist C, NIH, Roorkee expressed his views that severity of change in course of river flow depends on bank stability and energy of river and needs to be taken into consideration. He also expressed that the mining activity in the river may increase silt content, which may affect the cost of purification of the river water in downstream treatment plants, and damages assessment should include this aspect. He agreed to provide a note on the matter.

Dr C. Raghunathan, Scientist E, ZSI, Kolkata also expressed that silt / suspended solids content increases in river due to mining activity and result in increase in turbidity in the river, which affects the penetration of sunlight and impact primary production activity which influences the entire food chain. The assessment of damages must be done in consideration of the impacts caused to river flora and fauna. The silt formation in the river affects the fish population directly also as it gets deposited in the scales of fishes and reduce their production. He agreed to provide a note on the matter.

Third Meeting of the committee

The third meeting of the members of the committee constituted in compliance of NGT order dated-05.04.2019 in OA No. 360/2015 was convened on 24.07.2019 at CPCB, Delhi. The committee meeting was attended by Shri Sundeep, Director, MoEF&CC, Delhi (Member) and Dr. C.R. Babu, Professor Emeritus, University of Delhi (Special Invitee)

Dr. Purnamita Dasgupta, Professor, IEG, Delhi (Member) and Dr. K.S. Kavi Kumar, Professor, MSE, Chennai (Member) had confirmed participation but could not participate due to some unavoidable circumstances at the last moment. Shri A. Sudhakar, Additional Director, CPCB, Delhi (Member) could not participate as he was abroad and Dr. Yogesh Dubey, Associate Professor, IIFM, Bhopal could not participate due to important works in his institute.

It was expressed by Committee member and special invitee that considering the nature of work at least 06 month time may be required to prepare the report. The framework of the report may be prepared in one month and an interim report may be prepared in three months. CPCB may submit a progress report of committee meetings convened and request NGT for extension of time on behalf of committee.

27

Fourth Meeting of the committee

Based on the progress report and time extension request filed by CPCB on behalf of the committee constituted, NGT by its order dated-26.07.2019 in OA No. 360/2015 granted 03month time for submission of report to committee. CPCB convened fourth meeting of committee members on 16.09.2019 at CPCB HO Delhi. The committee meeting was attended by the following members:

1. Shri Sundeep, Director, MoEF&CC, Delhi
2. Shri A. Sudhakar, Additional Director, CPCB, Delhi
3. Dr. Purnamita Dasgupta, Professor, IEG, Delhi
4. Dr. K.S. Kavi Kumar, Professor, MSE, Chennai

(The member, Dr. Yogesh Dubey, IIFM, Bhopal was not able to attend the meeting.)

Discussion were held on the draft report prepared by CPCB based on inputs and suggestions of committee members, the scale/formula to compute the environmental compensation. It was agreed by committee members to categorise severity of impacts of illegal mining and extent of violations based on field inspections and accordingly, Risk factor and Deterrence factor to be considered for computation of environmental compensation whereby the risk factor to be categorised into four level and Deterrence factor for higher extent of violations, based on quantifiable exceedance evaluated.

The meeting concluded with committee members agreeing on basic formula/scale of compensation and further agreed to provide correction in the draft report.

Fifth Meeting of the committee

In consideration of time bound finalization of report, the fifth meeting of the members of the committee constituted in compliance of NGT order dated-05.04.2019 in OA No. 360/2015 was convened on 11.12.2019 at MoEF&CC, Delhi. The committee meeting was attended by Shri Sundeep, Director, MoEF&CC, Delhi (Member), Dr. Purnamita Dasgupta, Professor, IEG, Delhi (Member) and representatives of CPCB Delhi. Discussion were held on final draft of the report and inclusion of inputs provided by the committee members in the final draft. The committee members agreed to time bound finalization of the report and given concurrence to CPCB and submission of report to Hon'ble NGT on finalization.

Annexure II

1. Write up provided by Prof. C.R. Babu, Professor Emeritus, University of Delhi

Adverse Impacts of sand mining and creation of guide bunds and marginal bunds on Rivers and their Tributaries

(Source: Impacts of sand mining on Ecosystem structures, process Biodiversity in Rivers by Lois Koehnkem)

Sand Mining

Three types of sand mining are common in river systems. In stream mining (mining in channel), river-bed mining (mining near the channel) and mining from flood plains. All three types of mining are rampant across the country, as sand is an important natural resource and used widely in the construction activity.

Sand mining encompass excavation of aggregates consisting of sand, gravel, pebbles or cobbles; but in this note sand mining refers to mining of sand which include fine grained sediments which are rich in nutrients and sediment of intermediate size consisting of fine to coarse sand and very coarse sediment consisting of very coarse sand only. Very coarse sediment, as a rule, contains very coarse sand besides larger material such as pebbles, cobbles and boulders which are usually absent in river channels that develop within the sediment deposits of alluvial river system. All three kinds of sediments in have specific roles in the riparian ecology. For example, the fine grained sediments transported in suspension form and are deposit in deep channels and flood plains where low energy environment prevails. The fine grained sediment is rich in nutrients and affects water quality and control light penetration in the channel. The intermediate size grained sediment is transported in suspension during high flows or as bed load during low energy, and it is stored in the bed, banks, flood plains and bars (sand bars) of river system.

The continuous deposition of sand is essential for the maintenance of delta and shore line stability which form the first line protection against storm surge and other extreme events. The very coarse sediment is transported during very high flows and moves as bed load – rolling or bouncing along the bed of the river. The transport and deposition of sediment (sand) in the river system generate a mosaic in stream /in channel habitats that form the basis of ecological functioning of rivers/streams. In other words, sediments (sand) movements and deposition are integral part of the river system and are critical in sustaining its ecological functions.

All the three types of sand mining is common all along Yamuna, particularly in both upstream and downstream of Delhi. In plains sand mining includes fine grained

sediment, intermediate sized sediment and very coarse sediment; but in the hilly areas not only mining of aggregates but also pebble mining is common.

Adverse impact of sand mining

The extraction of sand (sand mining) from the river system has several adverse impacts on the riparian ecosystems. Some of the major adverse impacts are mentioned below.

Sand mining results in removal of sediments, and stones, and alteration in the transport of sediment, both of which bring physical and ecological changes in river channels. Since the river channels itself develops within the sediment deposits of alluvial river system, sand mining leads to erosion of channel banks, bars and flood plains. Sediment transportation also affects bedrock controlled reaches where localised sediment deposits serve as substratum for vegetation and habitats for riparian and terrestrial species.

The sediment load and river morphology are controlled/ maintained by balance between sediment bed, sediment grain-size, water flow and slope of the river. Sand mining alters all the four variables, For example, reduction in sediment load and reduction in medium sized sediment and local increase in slope of the river due to sand mining cause bed erosion that can propagate both upstream and downstream. Sand mining brings in changes in all the four variables and these changes resulted in three kinds of impacts: (i) Physical, ecological and social impacts.

A. Physical Impacts:

Changes in the channel morphology, alteration in the flow regime, and changes in the composition and movement of sediments impact on quality of water and ground water. A total of 107 different physical impacts were recorded in the scientific literature.

(I) Both channel widening and narrowing across the river is due to sand mining has been reported. The channel incision is the major physical impact of sand mining in the rivers. The channel incision takes place from the lowering of the bed of river due to erosion of riverbed which results from the creation of a nick point by mining in the river bed. The impacts of incision are listed below:

(a) The turbulence, as water flows over the nick point, causes erosion of the river bed with the nick point retreating in an upstream direction and this upstream movement of the nick increases the slope of the river resulting in increase in water velocity during high flow events leading to increased erosion in downstream.

30

(b) The deeper and steeper river bed will cause an increase in river energy and erosion which result in continual of incision leading to narrower channel.

(c) Channel incision also results in vertical instability in the channel that make it narrower, but lateral instability in the form of stream bank erosion result in widening of channel which in turn results in shallowing the bed. Both shallowing and widening of channel increase stream temperature extremes; Shallowing of river beds also results in flash floods; and channel instability also increases transport of sediments to downstream.

(d) Rivers narrowed through incision are disconnected with flood plains, the maintenance of which requires episodic inundation. These flood plains serve as wide range of ecological services due to exchange of water, sediment and organisms during inundation resulting in enhanced instream and flood plain productivity, while allowing recharging ground water; the flood plains allow the river to spread out during periods of high water and slows down and absorb high flows, and thereby reduce flood intensity and magnitude, and hence limit their impacts on downstream avian habitats and infrastructure. Sediment deposited provides influx of nutrients which enhances the productivity. Sand mining impacts all these services due to incision that leads to narrowing of channel.

(e) The incision can one channel of rivers from multiple channels as these channels ones, are separated by mobile islands. Yamuna river is the best example where multichannel river has become single channel river not only due to sand mining but also to filling up and encroachments of flood plains.

(f) By deepening of the base of river, the incision leads to decrease in ground water level, as the banks and surrounding permeable areas drain to the new lowered level.

(g) Mining from sand bars (bar skinning) can lead to bar erosion, and local channel and downstream widening. Additional channel widening occurs if mining causes river bank instability and collapse. This leads to decrease in local water velocity due to increased capacity of the channel, local increase in sediment load and increased downstream erosion due to reduction in sediment transport.

(II) Mining from flood plains (dry mining) alters the course of river. A series of pits near river course soon form a new channel by inundation and linking of pits. These inundated pits soon become lakes and contribute to increase in bank erosion. Flood plain mining also alters ground water levels. Ground water recharging is drastically reduced and the channel flow will be altered.

(III) Sand mining also creates sediment laden plumes in downstream and deposit in undesirable locations and coats substrates and make them unsuitable habitats. These plumes also reduce the depth to which light penetration occurs effecting growth of algae and aquatic vegetation.

(IV) On a large scale, reduction in the volume of sediment in the river results in decrease or absence of (sediment deposition) in deltas and coastal zone. This in turn results in erosion and subsidence of deltas and the degradation of deltas enhances the vulnerability to flooding leading to adverse impacts on human communities.

(V) In-stream sand mining changes water quality. For example, increase in turbidity at the site due to re-suspension of sediment and sedimentation from stock piling and dumping of excess mining material and pollution due to oil spills from machinery are common adverse impacts of mining at the site

(VI) Channel widening due to sand mining contributes to increase in temperature which in turn reduces dissolved oxygen and increase in toxicity due to heavy metals, pesticides and natural toxicants.

(VII) There will be increase in suspended solids at the mining site and downstream due to increase in riverbed and bank erosion from mining. This will increase the cost of water treatment in the downstream. This has been happening in Yamuna where upstream sand mining is contributing to high suspended solids in waters. Water quality changes due to mining may also result in the alteration in the distribution and availability of habitats which in turn affect aquatic flora and fauna.

B. Ecological Impacts

(I) Sand mining destroys spawning grounds of local fish populations leading to reduction in fish catch, replaces lentic species by lotic species and displaces native habitat specific species by generalists and invasive species, reduction in abundance of many game fishing species, extinction of local fish populations due to channel alteration by flood plains mining. Mining also decreases fish diversity.

(II) Sand mining has negative impacts on invertebrates, which play significant role in self-purification system of rivers. For example, enhanced turbidity will impact the macroinvertebrates. Low water levels due to incision have adverse impacts in mussels.

(III) Sand mining has also negative impacts on vegetation in riparian zones.

C. Social Impacts

Sand mining has adverse social impacts, besides physical and ecological impacts.

(I) Groundwater depletion, loss of land, depletion of fisheries, reduction in ground water quality and damage to infrastructure such as bridges, all of which have indirect impacts on the communities.

(II) Incision due to instream mining is a threat to support structures such as bridges and weirs. Upstream sand mining led to the replacement of bridges involving loss of several million dollars in California. In fact service lines like under cables and gas pipe lines have been exposed, and with decrease in river levels, the irrigational channel and pump sets rendered useless. All these impacts results in loss of several millions of rupees.

(III) An increase in distribution of flood waters with reduced sediment load and channel incision due to sand mining and land subsidence associated with the extraction of ground water contribute to reduction in the base level of the river which in turn also resulting in lowering of the surrounding water table leading to threatening water availability for local people and agriculture.

(IV) Sand mining also impacts land use and loss of land. Sand extraction leads to deep pools in flood plains leading to reduction in land availability for agriculture.

(V) Sand mining increased intrusion of salt water, which led to decrease in drinking water quality and salinization of agricultural lands. Vectors that carry infectious pathogens may become abundant in stagnant water filled pits due to sand mining.

Conclusions

To sum up, indiscriminate and rampant sand mining in rivers lead to reduction in water availability, change in the water quality, loss of self-purification system through loss of biodiversity, permanent changes in physical features of river morphology, hydraulics that lead to ecological disasters during extreme events, degradation of deltas and intrusion of salt water. We need to regulate and even prevent sand mining to save our river systems.

- ----------End of Write up ----------

2. Note Received from Dr. Sumant Kumar, Scientist C, NIH, Roorkee

Impact of Sand Mining on River Hydrology including SW and GW interaction

Rivers played a major role in development of human civilization. Many rivers of the world are being drastically altered beyond their self-resilience capacity due to accelerated developmental activities. Sand mining is one of the human intervention, which threatens the riverine ecosystem. The degree of sand mining impact (on-site and off-site) depends on geologic and geomorphic features. Continued and indiscriminate mining may cause changes in the physical characteristic of river in addition to disturbances to flora and fauna of riverine ecosystem. Keeping in view of the above facts, my views as discussed in the meeting also are listed below:

- Primary and secondary data (quantity of sand, lowering of river bed, shifting of river bank etc.) may be generated or collected.
- Impact on hydraulic structures such as dams, weirs and other important structures such as Intake well for drinking water supply should be studied.
- Assessment of saturated water present in mined sand should be quantified.
- Depth of mining may be regulated region-wise based on geological, geo-morphological, groundwater level and physical characteristics of river.
- Assessment of groundwater flow to/from river will depends to aquifer and river characteristic and hence it varies site to site.
- Water quality (suspended particles, turbidity, oil and grease etc.) of SW and GW in sand mined area may be assessed.
- Control measures such as bank stabilization should be evaluated.
- Remote sensing data may be used for morphological and other analysis of rivers.
- An integrated environmental assessment, management and monitoring program should be part of sand extraction processes.

3. Initial note on estimating ecological damage from illegal sand mining

(Prof. K. S. Kavikumar)

A draft framework for assessing the value of ecological damage due to illegal sand mining:

- First, in any given geographic area the extent of 'illegal' mining needs to be established. This can be done by making rapid assessment of extent of sand mining being carried out and netting out the area for which environmental clearance has been given (even in the mines that received environmental clearance, there could be violations and the same should be included in the 'illegal' mining area)

- For simplicity three main components can be considered for ecological damage assessment – material cost component, eco-restoration cost component, and NPV of foregone ecosystem services.
- The following time line could serve as basis for assessing these costs:

T1: Time when 'illegal' sand mining is recognized (ignoring the unauthorized sand mining being carried out prior to T1)
T2: Completion of restoration work; between the period T1 and T2 ecological restoration work is undertaken in and around the riverbed as suggested by the subject experts.
T3: The restoration work 'yields' ecosystem services (i.e., restoration of ecosystem services following the restoration work undertaken). In other words, beyond T3 the ecosystem provides all the services that it used to provide before the unauthorized sand mining has affected such services.
While it would be easy to establish T1 and T2, it is not easy to arrive at T3 in an objective manner and needs to be fixed based on inputs from the subject experts.

- Material Costs: The material costs could include the auction value of the seized mined material and any fines imposed on the 'illegal' mining activities. This cost will be in T1 year prices estimated at time T1.
In practice, the market values of the mined material can be taken for the cost estimation.

35

- Eco-restoration costs: This consists of the costs of suggested restoration activities in and around the mining area. It is expected that the restoration work would stretch over the period T1 and T2. The eco-restoration costs would be the present value (at T1) of the expected restoration expenses over the years T1 to T2.
  Standard restoration activities could be identified (including say, construction of retaining wall, plantation along river bank etc.) and cost estimations can be made based on normative values.

- Present Value of Foregone Ecosystem Services: This component is perhaps the most difficult one as it requires assessment of value of ecosystem services that would have been obtained in the absence of 'illegal' mining. One may have to source such information from the literature and after required value addition, use the per hectare value in a manner similar to what has been done in case of forest land. Once annual per hectare value is identified, the foregone value per year can be estimated by multiplying it with the extent of 'illegal' mining area. The present value calculation can then be carried out over the period T1 and T3.

- For the purpose of present value calculations (in case of the cost components involving eco-restoration and foregone ecosystem services), choice must be made for the relevant discount rate.

Annexure - III

Inputs about existing legal provisions regarding illegal mining

(MoEF&CC & CPCB)

Compensation as per Statutory Provisions

Hon'ble Supreme Court in its Judgement dated-02.08.2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause Vs. Union of India with Writ Petition (Civil) No. 194 of 2014, mentioned the provisions regarding mining activity under Mines and Minerals (Development and Regulation) Act, 1957 (or the MMDR Act), the Mineral Concession Rules, 1960 (or the MCR) and the Mineral Conservation and Development Rules, 1988 (or the MCDR).

Para 125-129 of the said Judgement defined the expression **Illegal Mining** as mining operations undertaken by any person in any area without holding a mining lease and any other mining operation conducted in violations of terms of the mining scheme, the mining plan and the mining lease as well as the statutes such as the Environment (Protection)Act, 1986, the Forest (Conservation) Act, 1980, the Water (Prevention and Control of Pollution) Act,1974 and the Air (Prevention and Control of Pollution) Act, 1981 and Wildlife Protection Act, 1972.

Para 150 of the said Judgement is related to applicability of Section 21(5) of MMDR Act when any person raises, without any lawful authority, any mineral from any land and, authority of the State Government to recover the price thereof as compensation. Accordingly, the extraction of mineral from permitted mining lease area over and above what is permissible under the mining plan or the environmental clearance is to be taken as extraction without lawful authority and attracts the provisions of Section 21(1) and Section 21(5) of MMDR Act.

In view of provisions under Section 21(1) and Section 21(5) of MMDR Act, the computation of cost of material illegal extracted will be as per applicable methodology and rules in MMDR Act.

Therefore, compensation can be classified in following two categories

I. Compensation for Illegal Mining shall be subjected to provision of section 21(1) and section 21(5) of MMDR Act, 1957, as amended from time to time, and cost associated for restoration of damages incurred due to such mining to any physical structures, flood plains and cost assessed for the services lost for the period to restore the damages.

37

II. Compensation for Non-Complying Mining shall be subjected to the recovery of revenue loss due to excess production over and above permitted capacity or area or depth under any applicable statutory provisions and cost associated for restoration of any damages incurred due to such mining to any physical structures, flood plains and cost assessed for the services lost for the period to restore the damages.

Illegal and Non-complying Mining

1. Illegal Mining means extraction of minerals or associated mining activities carried out, without any lawful authority, from land or river bed or both, or from prohibited area. Lawful authority includes mining permission from competent authority including permission or clearance under applicable statutory laws/rules (i.e. MMDR Act, Water (P&CP) Act, Air(P&CP) Act, E(P)Act, FC Act, WLPA etc.

2. **Non-complying** mining means extraction of minerals or associated mining activities carried out, with due permission of lawful authority, from land or river bed or both, or from prohibited or regulated area, but in contravention of stipulated conditions for undertaking such activities.

Sustainable Sand Mining Management Guidelines 2016

To deal with issues of legal sand mining, Ministry of Environment, Forest and Climate Change, Government of India have issued Sustainable Sand Mining Management Guidelines 2016. These guidelines were prepared after consultation with States and other stakeholders with an objective to ensure sustainable sand mining and environment friendly management practices in order to restore and maintain ecology of river and other sand sources. Emphasis has been given on use of information technology and services for scientific monitoring and transportation of mined out material.

Relief and Compensation under NGT Act 2010

The National Green Tribunal Act 2010 provides for filing of Application by a victim of pollution for grant of relief or compensation and other environmental damage before the Tribunal, or for restitution of the property damaged, or for restitution of the environment of the area, and empowers the Tribunal to pass order - to provide such relief or compensation, or for restitution of the property damaged, or for restitution of environment of the area.

38

Annexure - IV

Inputs/suggestions for detailed assessment of damages

(MoEF&CC)

There is no comprehensive or guiding rationale available for assessing environmental damage or for evaluation in quantifiable terms. Considering the diversified geographical, morphological, temporal and spatial variation in flow-regime of riverine system across Indian sub-continent, it is difficult to work out any one reasonable rationale for calculating NPV. It is essential to create such database by undertaking detail studies by experts on major riverine system across its stretch with significant variation.

A committee may be deputed consisting of domain experts viz. river morphology, biodiversity, agriculture, pollution control, irrigation / public works department, mining and local administration along with the Mine lease holders to assess the damage and quantifying the requisite variables for assessing the NPV values.

A baseline data assessment of the indicative attributes of the ecology which are having significant impacts and can be considered as an indicator, shall be collected as part of Environmental Impact Assessment study and submitted to the regulatory authority while seeking grant of environmental clearances. This will create database for assessing the damages as well as the loss in services. Such information will also facilitate the Regulatory authority to assess and impose appropriate conditions highlighting the risk associated to damages incurred due to non-compliance of the imposed conditions. This will extend the monitoring agencies to directly impose the environmental compensation in case the non-compliance is observed.

For area, where baseline data is not available including "illegal" mining, it is proposed that the values of the nearest legal mines or its baseline data shall be considered for defining the unavailable data and all calculation shall be based on the scientific primary data of the nearest assessed values.

Damages may be assessed as and when specific information on the ecological variables becomes available to the state. Each specific river basin will have its own set of most relevant variables and methodology to be considered for calculation of the NPV for ecological damages.

Table No. 05: Indicative Damages	
S.No.	**Damage type**
1	Ingress in Flood Plain (non-mining zone)
2	Flood Plain damage
3	Diversion of River flow or change in river morphology
4	Damages to agriculture land
5	Damages to public property (Roads/Bridges/embankment/ghats/etc.) or water intake point
6	Ingress in habitat of species of significant importance or damage to river vegetation

Pre-requisite for damage assessment

To evaluate the damage assessment caused due to mining in river, it is desirable to have pre-requisite information. A checklist needs to be prepared on important points in light of the comments provided by subject experts which are provided as annexures to this report for availability and facilitation of information to person involved for damage assessment in case of illegal mining in river. The checklist for requisite information should be prepared at every district level in respective state where riverbed mining is permitted. The checklist have to be prepared within one year of time period for existing mines and to be considered mandatory before auction of new mining leases.

In addition to checklist, the following information is necessary:

- District Survey Report and Audit Report
- Provision of Public Liability Insurance in Mine Lease Agreement
- Scheduled Market Rate of sand / gravel
- Flora and Fauna Inventory (Yearly basis)
- Inventory on River structures and their locations

Report of the damage assessment team shall be, but not limited to, the format suggested. Additional information which is observed as relevant by the domain expert members of the assessment team shall be appropriately reported and acted upon in due consideration of the basic objective of deriving a scientific rational for assessment of ecological of infrastructural damage arising due to the mining activity. Standard operating practice correct assessment of damage by the expert committee constituted by concerned authority, for the purpose is delivered below, which cane be modified based of site specific condition, and any deviation shall be recorded in the report.

40

Standard Operating Procedure

This Standard Operating Procedure (SOP) is applicable for damage assessment due to illegal mining and have to be undertaken in addition to related provisions in MMDR Act.

Step 1:	The assessment team should collect the information and documents prescribed in Pre-Requisite section.
Step 2:	The assessment team should verify the applicability / validity of statutes under EPA-1986, Air and Water Act, MMDR 1957, State Mines and Mineral Rules, etc.
Step 3:	Field visit should be conducted for identification of mining lease area (in hectare) and boundary pillar constructed to indicate the same.
Step 4:	With the help of GPS instrument, the team should assess the area where any extraction or mining have been carried out on day of visit and calculate the mined out area in hectare.
Step 5:	If available, the team may avail the use of latest satellite images for calculating the total mined out area.
Step 6:	The team should verify the Ground / Surface Level (in meter above MSL) of atleast 04 highest points in or around the area where mining has been done. The Ground / surface level will then be computed based on averaging of 04 highest points verified by the team.
Step 7:	With the help of Depth Measurement kit or any depth measuring instruments, the depth should be measured for atleast 04 points in mined out area. For computing the depth, averaging of value obtained at 04 points should be done.
Step 8:	Verification of compliance conditions of Environmental Clearance and Consent to operate, mining methodology under Mining Plan
Step 9:	Identification of vulnerable impacts observed on the field and non-compliance of conditions of Environmental Clearance and Consent to Operate.
Step 10:	Field Survey for identification, monitoring and verification of ecological species based on the information available and documents mentioned in Pre-requisite section.
Step 11:	Preparation of inventory of machinery used / observed on the field as per format in Checklist.
Step 12:	Preparation of inventory of hydraulic structures observed on the field as per format in Checklist.
Step 13:	Water sampling for assessment of water quality including physical and biological parameters.
Step 14:	Computation of amount of cost of damage in term of mined out mineral as per format.
Step 15:	Identification of restoration plan and computation of cost of restoration plan.

41

Damage Assessment Report Format			
Mining Lease	Individual / Cluster		
Total Mine Lease Area			
Area permitted for Mining (excluding safety bench marks)			
Permitted depth	------- meter		
Mining Area Description -	Riverbed / Floodplain / Combine Area		
Applicable Mining Method	Mechanised / Semi-mechanised / Manual		
Quantity available for mining			
Mineral available for mining			
Bulk Density of Mineral			
Replenishment Rate (Yearly basis)			
Ground Level	Point 01 -	Point 02 -	
	Point 03 -	Point 04 -	
	Average = ---------- meter above MSL		
Ground water Level	Point 01 -	Point 02 -	
	Point 03 -	Point 04 -	
	Average = ---------- meter above MSL		
Riverbed Depth	Point 01 -	Point 02 -	
	Point 03 -	Point 04 -	
	Average = ---------- meter above MSL		
River channel Width	-------meter		
River water Temperature (Avg.)	------- ° C		
River Flow Velocity	Jan. -	Feb. -	Mar. -
	Apr. -	May. -	Jun. -
	Jul. -	Aug. -	Sept. -
	Oct. -	Nov. -	Dec. -
Machinery Observed	Machinery	Capacity	Total Number
	JCB		
	Tractor-Trolley		
	Truck		
	Dumper		
	Any Other		
Hydraulic Structures	Type	Distance from mined out area	Total Number
	Remarks		

42

ANNEXURE-V

Item Nos.01 to 04, 06 to 15 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 360/2015
WITH
Original Application No. 366/2015
(M.A.No. 02/2019)
WITH
Original Application No. 368/2015
(M.A.No. 16/2019)
WITH
Original Application No. 173/2018
(Earlier O.A. No. 89/2017 (EZ)
(I.A. No. 76/2019)
WITH
Original Application No. 874/2018
WITH
Original Application No. 44/2016
WITH
Original Application No. 517/2015
WITH
Original Application No. 550/2015
WITH
Original Application No. 530/2016
WITH
Original Application No. 272/2016
WITH
Original Application No. 481/2016
WITH
Original Application No. 540/2015
WITH
Original Application No. 90/2016
WITH
Execution Application No. 40/2017
IN
O.A. No. 517/2015

National Green Tribunal Bar Association	Applicant(s)
Versus	
Virender Singh (State of Gujarat)	Respondent(s)
WITH	
National Green Tribunal Bar Association	Applicant(s)
Versus	
Dr.SarvabhoumBagali (State of Karnataka)	Respondent(s)
WITH	
National Green Tribunal Bar Association	Applicant(s)

43

Versus

Dr.Sarvabhoum Bagali (State of Maharashtra) Respondent(s)

WITH

Sudarsan Das Applicant(s)

Versus

State of West Bengal &Ors.
(State of West Bengal and Odisha) Respondent(s)

WITH

News item published in "The Tribune " Authored by Arun Sharma Titled "Mounds of sand on Sutlej banks, mining mafia digs in"

WITH

Mushtakeem Applicant(s)

Versus

MoEF& CC &Ors. Respondent(s)

WITH

Sandeep Kumar Applicant(s)

Versus

Ministry of Environment, Forests and
Climate Change &Ors. Respondent(s)

WITH

Virender Kumar Applicant(s)

Versus

Ministry of Environment, Forests and
Climate Change &Ors. Respondent(s)

WITH

Sandeep Kumar Applicant(s)

Versus

Ministry of Environment, Forests and
Climate Change &Ors. Respondent(s)

WITH

M/s Ganga Yamuna Mining Co. Applicant(s)

Versus

State of Haryana&Ors. Respondent(s)

WITH

Joginder Singh Applicant(s)

Versus

Ministry of Environment, Forests &Ors. Respondent(s)

WITH

Ved Pal Singh Applicant(s)

Versus

Ministry of Environment, Forests &Ors. Respondent(s)

44

WITH

Chander Mohan Uppal — Applicant(s)

Versus

State of U.P. &Ors. — Respondent(s)

WITH

Sandeep Kumar — Applicant(s)

Versus

Ministry of Environment, Forests and Climate Change &Ors. — Respondent(s)

Date of hearing: 05.04.2019

CORAM:HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE K. RAMAKRISHNAN, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

For Applicant(s): Mr. Raj Panjwani, Sr. Advocate, Mr. Aagney Sai, Advocate
Mr. Sravan Kumar, Advocate
Mr. Rahul Choudhary, Ms. Meera Gopal, Mr. Sharan Balakrishna, Advocates.

For Respondent (s): Ms. Puja Singh, Advocate for the State of Gujarat
Mr. Devraj Ashok, Advocate for State of Karnataka
Mr. Soumyajit Pani, Advocate for State of Odisha
Mr. Raja Chatterjee, Advocate for State of West Bengal
Mr. Ankit Verma, Advocate for State of U.P
Mr. Divya Prakash Pande, Advocate
Mr. Shlok Chandra, Mr. Ritesh Kumar Sharma, Advocates
Mr. Sany Antony, Advocate
Mr. Ankur Mittal, Mr. Abhay Gupta, Advocate
Mr. Rahul Khurana, Advocate, Mrs. Madhri Gupta, Mr. Sanjay Sabbarwa, Mining Officer

ORDER

1. The common question for consideration in this group of matters is the steps required to be taken for environment protection from unregulated sand mining in the States of Gujarat, Karnataka, Maharashtra, West Bengal, Odisha, Punjab, Haryana and Uttar Pradesh. The issue is common even with regard to States who are not party to these proceedings.

45

Background

2. The Hon'ble Supreme Court, vide judgment in *Deepak Kumar Vs State of Haryana &Ors. (2012) 4 SCC 629*, directed that leases of minor minerals, including their renewal, even for an area of less than 5 hectares (ha) be granted only after environmental clearance from the Ministry of Environment and Forest and Climate Change (MoEF & CC). This direction was held to be necessary in view of degradation of environment on account of illegal and unrestricted upstream, in stream and flood plain sand mining activities. Under the existing guidelines, no environmental clearance was required for minor leases of less than 5 hectare area. The result was that there was no regulation of such mining which resulted in environmental degradation. Even bigger cluster was split up in less than 5 ha units to avoid law.

3. The Hon'ble Supreme Court observed that absence of regulation of such mining was not justified as it was threat to bio-diversity, could destroy riverine vegetation, cause erosion, pollute water sources, badly affecting riparian ecology, damaging ecosystem of rivers, safety of bridges, weakening of riverbeds, destruction of natural habitats of organisms living on the riverbeds, affects fish breeding and migration, spell disaster for the conservation bird species, increase saline water in the rivers.

4. The Hon'ble Supreme Court observed that such mining has direct impact on the physical habitat characteristics of the rivers such as bed elevation, substrate composition and stability, in-stream

roughness elements, depth, velocity, turbidity, sediment transport, stream discharge and temperature. Increase in demand of sand has placed immense pressure in the supply of sand resource and mining activities were going on illegally as well as legally without requisite restrictions. Lack of proper planning and sand management disturbs marine ecosystem and upset the ability of natural marine processes to replenish the sand.

5. The Hon'ble Supreme Court noted that core group was constituted by the MoEF&CC to examine the impact of minor minerals on riverbeds and ground waters. A draft report was prepared recommending mandatory preparation of mining plan on the pattern of mining plans for major minerals. Further recommendations are reclamation and rehabilitation of abandoned mines, proportion of hydro geo-logical balance for minerals below ground water table limiting depth of mining to 3 meter and identification on locations where mining should be permitted was required. There is need for identifying safety zones in the proximity of intendments. Thus, strict regulatory parameters were required for regulating mining of minor minerals. It was noted that in-stream mining lowers the stream bottom of rivers which may lead to bank erosion. Depletion of sand in the stream bed causes deepening of rivers which may result in destruction of aquatic and riparian habitats. It has impact on stream's physical habitat characteristics.

6. The grievance before the Tribunal is that the river bed mining was taking place at several locations in violation of judgment of the Hon'ble Supreme Court either without any valid lease or under leases

given without following the strict regulatory regime in terms of judgment of the Hon'ble Supreme Court or in violation of lease conditions.

Proceedings before NGT

7. This Tribunal passed several orders in the present matter since 05.08.2013[1] to check illegal sand mining from the riverbeds without environmental clearance or in violation of terms of environmental clearance. The State of Uttar Pradesh was directed to frame a policy to check illegal sand mining. MoEF&CC was also directed to prepare comprehensive guideline on the subject. The Tribunal considered regulatory regime applicable in some of the States in the light of the judgment of the Hon'ble Supreme Court in *Deepak Kumar* (supra), including in the States of Uttar Pradesh, Haryana, Madhya Pradesh, Maharashtra, Karnataka, Gujarat, West Bengal and Odisha. The MoEF&CC issued Sustainable Sand Mining Guidelines 2016, vide notification dated 15.01.2016. Thereafter, further directions were issued by the Tribunal in the light of report of the High-powered Committee[2].

8. Despite this, the menace of illegal sand mining in India continues unabated. As per reports, the sand business in India employs over 35 million people and is valued at well over $126 billion per annum. In the year 2015-2016, there were over 19,000 cases of illegal minor minerals including sand in the country.[3] In Uttarakhand, a 115 years old bridge collapsed due to overloaded sand trucks. In Maharashtra,

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[1] In O.A. No 38/2015
[2] Order dated 08.08.2018 in Gurpreet Singh Bagga Vs. Ministry of Environment, Forest and Climate Change, E.A. No. 17/2016
[3] http://www.legalserviceindia.com/legal/article-73-why-is-illegal-sand-mining-harmful-.html

26,628 cases of illegal sand mining were recorded in the year 2017. The State of Maharashtra has the highest number of cases of non-compliance of Sustainable Sand Mining Management Guidelines, 2016. The State of Kerala suffered hugely in 2004 Tsunami and 2018 floods which several report explain were aggravated by illegal sand extraction.[4] The issue of illegal sand mining is also rampant in the states of Goa[5], Bihar[6], Tamil Nadu[7], Uttarakhand[8], Telangana[9], Jammu and Kashmir[10] amidst others.

9. Natural resources are 'public goods' and the Doctrine of Equality must guide the State in determining the actual mechanism for distribution of natural resources. It takes into account the rights and obligations of the State vis-a-vis its people and the demands that the people be granted equitable access to natural resources and they are adequately compensated for the transfer of these resources for public domain and regulation of rights and obligations of the State vis-à-vis private parties seeking to acquire the resources which demands that the procedure adopted and distribution is just and transparent.

10. Public Trust Doctrine primarily rests on the principle that certain resources like air, sea, water and forest have great importance to public as a whole and it is wholly unjustified to make them a subject of private ownership. The public trust doctrine enjoins upon the Governments to protect the resources for enjoyment of general public

[4] https://sandrp.in/2019/03/01/sand-mining-2018-is-it-a-national-menace/
[5] https://timesofindia.indiatimes.com/city/goa/govt-is-ignoring-illegal-sand-mining/articleshow/67908428.cms
[6] https://www.firstpost.com/india/illegal-sand-mining-part-3-bihar-govts-attempted-crackdown-has-sent-prices-soaring-officials-face-axe-as-rivers-in-ruin-6008351.html
[7] https://en.wikipedia.org/wiki/Sand_mining_in_Tamil_Nadu
[8] https://sandrp.in/tag/uttarakhand-sand-mining/
[9] https://sandrp.in/2019/02/26/sand-mining-2018-telangana-and-andhra-pradesh/
[10] https://greaterkashmir.com/article/news.aspx?story_id=309365&catid=2&mid=53&AspxAutoDetectCookieSupport=1

49

rather than to permit the use for private ownership of commercial purposes.[11]

11. When the State holds a resource that is freely available for the use of public, it provides for a high degree of judicial scrutiny on any action of the State in dealing with the subject in a prudent manner. It is the duty of the State to provide complete protection to the natural resources as a trustee of the public at large. Moreover, a policy to give free sand must be justified as a welfare measure but even this consideration cannot justify unregulated and unscientific mining unmindful of impact on environment. If in the course of mining, damage is caused, cost of the same must be recovered from such violators. In any case, the authorities cannot avoid their duty under the environmental law to prevent and restore the damage which is an inalienable duty of the State.

Sudarsan Das v. State of West Bengal

Vide order dated 04.09.2018 in *O.A No. 173/2018, Sudarsan Das v. State of West Bengal & Ors,* the Tribunal considered the issue of unchecked mechanised sand mining on the banks of river Subarnarekha by use of suction pumps, earth movers and netting in an area falling under Jaleshwar Tehsil, Balasore District, Odisha on the Odisha – West Bengal Boarder area and neighbouring district of West Medinapur in the State of West Bengal. The mining was being done by a method whereby ground water is allowed to seep into excavation of 40 to 50 feet beneath the river and collected in sumps and pumped away for disposal. No environmental clearance had been

[11]Natural Resources Allocation in RE: Special Reference No. 1/2012, (2012)10 SCC1, para 77-78,89-92

50

taken nor consent taken from the Pollution Control Board. This was impacting the ecology of the river including its channel geometry, bed elevation, substratum composition and stability, instream roughness of the bed, flow velocity, discharge capacity, sediment transpiration capacity, turbidity, temperature, etc. Such indiscriminate mining was the cause of the river Subarnarekha changing its course every year and made susceptible to flooding during every monsoon, threatening the safety of the villages situated along the river bank due to the banks being severely eroded in villages Rajnagar, Mankia, Kanrpur, Totapada, Beherasahi and Praharajpur. The authorities confirmed that illegal mining was taking place at large scale without any Environmental Clearance under the Environment (Protection) Act, 1986 or Consent under the Water (Prevention and Control of Pollution) Act, 1974 or the Air (Prevention and Control of Pollution) Act, 1981. Sustainable Sand Mining and Management Guidelines, 2016 were also not being followed. There was adverse impact on the ecology. No Management Plan was prepared for replenishment of preventive steps. Safeguards suggested in the report of High-powered Committee in September, 2016[12] were also not been adopted.

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[12] The report suggest follows:

"i) Project Proponent must ensure that the security features of Transport Permission viz. (a) Printed on Indian Bank Association (IBA) approved Magnetic Ink Character Recognition Code (MICR) paper; (c) Unique Barcode; (d) Unique Quick Response Code (QR); (e) Fugitive Ink Background; (f) Invisible Ink Mark; (g) Void Pantograph; (h) Watermark.

ii) Project Proponent must ensure that the CCTV camera, Personal Computer (PC), Internet Connection, Power Back up, access control of mine lease site; and arrangement for weight or approximation of weight of mined out mineral on basis of volume of the trailer of vehicle used at mine lease site are available.

iii) Project Proponent must ensure the Scanning of Transport Permit or Receipt and uploading on Server.

iv) The State Mines and Geology Department should print the Transport Permits/Receipt with security features enumerated at Paragraph (i) above and issue them to the mine lease holder through the District Collector. Once these Transport Permits or Receipts are issued, they would be uploaded on the server against that mine lease area. Each receipt should be preferably with pre-fixed quantity, so the total quantity gets determined for the receipts issued. When the Transport Permit or Receipt barcode gets scanned and invoice is generated,

the particular barcode gets used and its validity time is recorded on the server. So all the details of transporting of mined out material can be captured on the server and the Transport Permit or Receipt cannot be reused.

v) The staff deployed for the purpose of checking of vehicles carrying mined mineral should be in a position to check the validity of Transport Permit or Receipt by scanning them using website, Android Application and SMS.

vi) In case the Vehicle breakdown, the validity of Transport Permit or Receipt shall be extended by sending SMS by driver in specific format to report breakdown of vehicle. The server will register this information and register the breakdown. The State can also establish a call centre, which can register breakdowns of such vehicles and extend the validity period. The subsequent restart of the vehicle also should be similarly reported to the server/call centre.

vii) The route of vehicle from source to destination should be tracked through the system using check points, Radio-frequency identification (RFID) Tags, and Global Positioning System (GPS) tracking.

viii) The system shall enable the Authorities to develop periodic report on different parameters like daily lifting report, vehicle log/history, lifting against allocation, and total lifting. The system can be used to generate auto mails/SMS. This will enable the District Collector/Magistrate to get all the relevant details and will enable the authority to block the scanning facility of any site found to be indulged in irregularity. Whenever any authority intercepts any vehicle transporting illegal sand, it shall get registered on the server and shall be mandatory for the officer to fill in the report on action taken. Every intercepted vehicle should be tracked."

Considerations required to be kept in mind for sustainable sand mining are:

a. Parts of the river reach that experience deposition or aggradation shall be identified first. The Lease holder/ Environmental Clearance holder may be allowed to extract the sand and gravel deposit in these locations to manage aggradation problem.

b. The distance between sites for sand and gravel mining shall depend on the replenishment rate of the river. Sediment rating curve for the potential sites shall be developed and checked against the extracted volumes of sand and gravel.

c. Sand and gravel may be extracted across the entire active channel during the dry season.

d. Abandoned stream channels on terrace and inactive floodplains be preferred rather than active channels and their deltas and flood plains. Stream should not be diverted to form inactive channel.

e. Layers of sand and gravel which could be removed from the riverbed shall depend on the width of the river and replenishment rate of the river.

f. Sand and gravel shall not be allowed to be extracted where erosion may occur, such as at the concave bank.

g. Segments of braided river system should be used preferably falling within the lateral migration area of the river regime that enhances the feasibility of sediment replenishment.

h. Sand and gravel shall not be extracted within 200 to 500 meter from any crucial hydraulic structure such as pumping station, water intakes, and bridges. The exact distance should be ascertained by the local authorities based on local situation. The cross-section survey should cover a minimum distance of 1.0 km upstream and 1.0 km downstream of the potential reach for extraction. The sediment sampling should include the bed material and bed material load before, during and after extraction period. Develop a sediment rating curve at the upstream end of the potential reach using the surveyed cross- section. Using the historical or gauged flow rating curve, determine the suitable period of high flow that can replenish the extracted volume. Calculate the extraction volume based on the sediment rating curve and high flow period after determining the allowable mining depth.

i. Sand and gravel could be extracted from the downstream of the sand bar at river bends. Retaining the upstream one to two thirds of the bar and riparian vegetation is accepted as a method to promote channel stability.

j. Flood discharge capacity of the river could be maintained in areas where there are significant flood hazard to existing structures or infrastructure. Sand and gravel mining may be allowed to maintain the natural flow capacity based on surveyed cross- section history.

k. Alternatively, off-channel or floodplain extraction is recommended to allow rivers to replenish the quantity taken out during mining.

l. The Piedmont Zone (Bhabhar area) particularly in the Himalayan foothills, where riverbed material is mined, this sandy-gravelly track constitutes excellent conduits and holds the greater potential for ground water recharge. Mining in such areas should be preferred in locations selected away from the channel bank stretches.

m. Mining depth should be restricted to 3 meter and distance from the bank should be 3 meter or 10 percent of the river width whichever less.

n. The borrow area should preferably be located on the river side of the proposed embankment, because they get silted up in course of time. For low embankment less than 6 m in height, borrow area should not be selected within 25 m from the toe/heel of the embankment. In case of higher embankment the distance should not be less than 50 m. In order to obviate development of flow parallel to embankment, cross bars of width eight times the depth of borrow pits spaced 50 to 60 meters centre-to-centre should be left in the borrow pits.

o. Demarcation of mining area with pillars and geo-referencing should be done prior to start of mining."

12. The Management Plan as per the guidelines is to require system of replenishment as well as preventive steps during the sand mining. Replenishment and reclamation of riverine sand are the integral part. Guidelines also deal with the issue of depth of mining and strict regulatory regime. The management of mining clusters should have a separate approach. Management of sand deposited after the floods should be treated as separate for mining. Monitoring system proposed includes safeguards during transport as well as checking of condition of mining.

13. The Tribunal noted that Ministry of Mines and Indian Bureau of Mines (IBM) had developed Mines Surveillance System (MSS), with assistance from Bhaskaracharya Institute for space applications and Geoinformatics (BISAG), Gandhinagar and Ministry of Electronics and Information Technology (MEITY). The Mining Surveillance System (MSS) is a satellite-based monitoring system which aims to establish a regime of responsive mineral administration by curbing instances of illegal mining activity through automatic remote sensing detection technology.

14. In view of above, the Tribunal directed[13] the MoEF&CC to revise its guidelines as in-spite of the guidelines already issued, the monitoring mechanism was not working effectively. The directions of this Tribunal are:

> "*i. Mining Surveillance System discussed in para 23 above be finalized in consultation with ISRO Hyderabad.*

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13 Vide order dated 04.09.2018 inOriginal Application No. 173 of 2018 (Earlier O.A. No. 89/2017) (EZ) in the matter of Sudarsan Das Vs. State of West Bengal &Ors.

ii *Safeguards suggested in Sustainable Sand Mining Guidelines published by the MoEF&CC in the year 2016.*

iii *Suggestions in the High-Powered Committee Report.*

iv *Requirement of demarcation of boundaries being published in respect of different leases in public domain.*

v. *Need to issue SOP laying down mechanism to evaluate loss to the ecology and to recover the cost of restoration of such damage from the legal or illegal miners. Such evaluation must include cost of mining material as well as cost of ecological restoration and net present value of future eco system services forgone.*

vi. *Need to set up a dedicated institutional mechanism for effective monitoring of sand and gravel mining which may also take care of mining done without any Environmental Clearance as well as mining done in violation of Environmental Clearance conditions.*

vii. *The Mining Department may make a provision for keeping apart atleast 25% of the value of mined material for restoration of the area affected by the mining and also for compensating the inhabitants affected by the mining.*

viii. *One of the conditions of every lease of mine or minerals would be that there will be independent environmental audit atleast once in a year by reputed third party entity and report of such audit be placed in public domain.*

ix *In the course of such environmental audit, a three member committee of the local inhabitants will also be associated. Composition of three members committee may preferably include ex-servicemen, former teacher and former civil servant. The Committee will be nominated by the District Magistrate."*

54

15. Such steps were to be worked out within two months and circulated to all States. The mechanism is to provide for a report of implementation from the concerned States every quarter. The matter needs to be reviewed after every six months by the MoEF & CC. The direction with regard to setting up of 'dedicated institutional mechanism' for monitoring of conditions of Environmental Clearance as granted under EIA Notification, 2006 in respect of sand and gravel mining as directed in para (vi) is for an All-Encompassing Body to monitor the conditions of Environmental Clearance with respect to all development projects. Report of the steps taken by MOEF&CC was to be furnished to this Tribunal by email at filing.ngt@gmail.com on or before 31.12.2018.

16. The Tribunal also issued directions to the State of West Bengal and Odisha to take steps as follows:

"

i. *The State of West Bengal and Odisha may demarcate the boundaries for regulating grant of sand mining lease within three months from today. No mining lease of minor minerals may be given in the area in question till demarcation is complete. All existing mining operations in those areas shall remain suspended till demarcation work is completed and attains finality. To carry out the demarcation, the Chief Secretaries of the two States may constitute a team of three suitable officers each within two weeks. The said teams may hold their first meeting within one month.*

ii. *The States of West Bengal and Odisha must ensure that mining in all sand mining blocks is undertaken strictly in accordance with the provisions of EIA Notification, 2006, MoEF*

55

Notification dated 15th January, 2016 and the Sustainable Sand Mining Management Guidelines, 2016. They must also ensure that no sand mining is permitted without due compliance of Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 as well as regulations governing clearances by the Central Ground Water Authority. The District Administration must be held accountable for any failure.

iii. *District Magistrates and Superintendents of Police, Balasore district in Odisha and Paschim Medinapur, West Bengal, respectively, shall seize all sump pumps, other machinery, tools, vehicles, etc. used for carrying out illegal sand mining.*

iv. *Apart from instituting appropriate criminal proceedings against those carrying out illegal mining, exemplary penalty shall be imposed against them by the concerned District Magistrates within three months from today to cover the cost of restoration of environment and to compensate the victims.*

v. *The Chief Secretaries of the two States shall also get prepared jointly a detailed restoration plan for river Subarnarekha and its riverbeds for which a Committee of experts shall be constituted from independent institutions, i.e., the CPCB, Indian School of Mines, Dhanbad and the respective State Pollution Control Boards as members. Such constitution may take place within one month.*

vi. *The Expert Committee shall carry out detailed study and submit the restoration plan, as far as may be practicable, within three months after its constitution.*

vii. *The Committee shall also get the assessment done through Indian Council of Forestry Research and Education, Dehradun of the ecological damage on account of illegal mining by incorporating the following components: a) Cost of riverbed material. b) Cost of ecological restoration. c) Net present value of the future ecosystem services foregone.*

viii. *The above steps may be facilitated by the Regional Office of the CPCB as nodal officer, by coordinating with the Chief Secretaries of the two States.*

ix. *The damage suffered by the inhabitants caused by the illegal mining may also be assessed by the above Committee, which shall form a separate component of the Restoration Plan for river Subarnarekha as per direction No. (v) above. Cost of restoration plan shall be recovered as environmental compensation from the illegal miners, to be identified by the District Magistrate. The component of the compensation in respect of damages suffered by the inhabitants may be credited with District Legal Services Authority. The District Legal Services Authority may disburse the same to the victims of illegal mining, after proper identification."*

17. An oversight Committee was formed headed by Justice R.K. Merathia, former Judge of Jharkhand High Court to oversee the execution of above directions which was to function for six months.

Consideration in Today's Proceedings

Sand Minning in the State of West Bengal and Odisha

18. The matter has been listed today to consider the report from the MoEF & CC which was to be furnished by 31.12.2018 in terms of

57

para 28 in *Sudarshan Das* (supra) and report of the oversight Committee which was to be furnished within three months in respect of steps taken by the State of West Bengal and Odisha in terms of direction of this Tribunal.

19. We may note that vide order dated 16.01.2019 in *O.A. No. 606/2018*, titled *Compliance of Municipal Solid Waste Management Rules, 2016*, the Tribunal flagged the issue of sand mining as one of the issues required to be monitored by the Chief Secretaries of the concerned States and to be reported to the Tribunal on personal appearance of Chief Secretaries before the Tribunal.

20. In pursuance of the said direction, Chief Secretaries of Odisha and West Bengal furnished their respective reports on 26.03.2019 and 02.04.2019. Learned counsels for the State of West Bengal and Odisha have relied upon the said reports during the hearing of present cases. The reports were not found to be satisfactory as per orders of the Tribunal dated 26.03.2019 and 02.04.2019 respectively and further directions were issued.

21. Question for consideration is further directions in the matter. We will consider this aspect after noticing developments in connected cases.

Sand Mining in the State of Gujarat

22. Following the above order in Sudarsan Das (*supra*), the issue of illegal sand mining in the State of Gujarat was dealt with in *O.A. No. 360/2015, National Green Tribunal Bar Association v. Virender Singh (State of Gujarat)*. The Tribunal passed several orders from time to time since 28.11.2016 and finally considered the report of the State

of Gujarat vide order dated 13.07.2018 to the effect that persons engaged in illegal mining were identified and proceeded against. The Tribunal directed the State of Gujarat to take further preventive and remedial steps and observed that compounding fee to be recovered should be fixed having regard not only to the cost of mined material but also the cost of restoration of the environment and cost of ecological services lost forever and should be separately accounted for, for restoration of the environment. Again, vide order dated 17.09.2018, the Tribunal considered the policy of the State of Gujarat but found that preventive and remedial steps proposed were not sufficient. Damage caused to the environment was not fully taken into account. It was required to include Net Present Value (NPV) of future ecosystem services foregone forever. It was also observed that the preventive steps should also include demarcation and publication of boundaries in different leases and the same may be placed in the public domain. The Tribunal also referred to other orders on the subject being orders dated 05.09.2018, 10.09.2018 and 13.09.2018 in *Original Application No. 44/2016- Mushtakeem Vs. MoEF & CC & Ors., Original Application No. 304/2015- Jai singh & Anr. Vs. Union of India & Ors.* and *Original Application No. 186/2016 - Satendra Pandey Vs. Ministry of Environment, Forest & Climate Change & Anr.* The application was disposed of but the action taken report was required to be furnished. Accordingly, the matters have been put up today for consideration of the action taken report.

23. We may also note that vide order dated 04.01.2019 in *Original ApplicationNo.110(THC)/2012, Threat to life arising out of coal mining in south Garo Hills district v. State of Meghalaya & and Ors.*, the

59

issue of compensation and seizure of vehicles in the context of illegal rat hole mining in the State of Meghalaya was considered. On the subject of compensation to be recovered for damage to the environment, it was observed:

> *"31. Paying capacity and the amount which may act as deterrent to prevent further damage is also well recognised. Net Present Value of the ecological services foregone and cost of damage to environment and pristine ecology,the cost of illegal mined material, and the cost of mitigation and restoration are also relevant factors. The Committee may go into these aspects to determine the final figure.*
>
> *32. We are satisfied that having regard to the totality of factual situation emerging from the record, damages required to be recovered are not, prima facie, less than Rs. 100 Crores. Accordingly, by way of an interim measure, we require the State of Meghalaya to deposit Rs. 100 crores within two months with the CPCB in this regard."*

On the subject of vehicles, it was observed:

> *" 36. The Committee may also consider the following:-*
>
> > *Any cranes and trucks found to be involved in illegal mining or transportation which have not yet been seized may also be seized. The seized vehicles or equipments be released by the concerned District Magistrates only after recovering damages to the extent of 50% of the showroom 17 price of the vehicles or equipments. The said amount may also be credited to the restoration fund."*

24. We have perused the report filed by the State of Gujarat vide email dated 17.12.2018 to the effect that environment compensation scale has been enhanced which now can be between 21% to 41% value of the illegally mined material and if such value is found to be less than the cost of the damage to the environment, the matter is to be referred to the State Pollution Control Board. The above

compensation is in addition to the penalties under the Rules. However, the scale of penalty has not been specified.

25. Accordingly, further directions are required which may apply not only to the State of Gujarat but also other States. We may consider this aspect after taking note of developments in other States.

Sand Mining in the State of Karnataka

26. *O.A. No. 366/2015 (M.A. No. 02/2019), National Green Tribunal Bar Association v. Dr. Sarvabhoum Bagali (State of Karnataka) and O.A. No. 368/2015 (M.A. No. 16/2019), National Green Tribunal Bar Association v. Dr. Sarvabhoum Bagali (State of Maharashtra)* relate to the issue of sand mining in the State of Karnataka and Maharashtra. Vide order dated 25.09.2018, the matter was considered in the light of observations in *O.A No. 173/2018 (Earlier O.A. No. 89/2017 (EZ) (I.A. No. 76/2019), Sudarsan Das Vs. State of West Bengal &Ors and Original Application No. 186/2016, Satendra Pandey v. Ministry of Environment, Forest & Climate Change &Anr.* The States of Karnataka and Maharashtra were required to take steps as per the directions in the above matters, to the extent applicable and file an affidavit.

27. Accordingly, an affidavit has been filed on 06.03.2019 by the state of Karnataka stating that there was no sand *mafia* in the State of Karnataka and only there are exceptional instances. It is further submitted:

> *"I submit that all necessary steps are taken by Government of Karnataka and compliance report is submitted in this case, separately. If this Hon'ble Tribunal opines to establish any "Monitoring*

Mechanism", we welcome it. However, any suggestions or directions may kindly be issued to Government of Karnataka to (1) evaluate loss to the ecology (2) to recover cost of restoration from illegal miners (3) to monitor mining (4) to make provision for restoration (5) for compensation to the inhabitants and (6) for audit etc., the Government of Karnataka will obey the directions of this Hon'ble Court."

28. Our attention has been drawn to a news article published in Bangalore Mirror dated 24.12.2018 appearing under the title "Karnataka: Sand mafia under scanner after lorry runs over official"[14] and an article published in Decan Herald dated 17.09.2018 under the title "Karnataka is a leading State that witnesses the devastating effects of sand mining"[15] to the effect that fourteen million metric tonnes of sand unaccounted for the State of Karnataka is as follows:

> *"The state government is receiving approximately Rs 150 crore as royalty from legitimate sand mining blocks every year. As per estimates, the state government is losing around Rs 200 crore per year due to illegal sand mining. Here is a ballpark estimation to find out the consumption of sand in the state. According to cement manufacturing companies' data, around 18 million metric tonnes of cement is sold in the state every year. The cement-sand mix ratio is either 1:4 or 1:6 (four or six bags of sand per cement bag). Even if 1:4 ratio is taken, a whopping 70 million metric tonnes of sand is approximately used in the state every year. The official data from the Department*

[14] https://bangaloremirror.indiatimes.com/bangalore/others/karnataka-sand-mafia-under-scanner-after-lorry-runs-over-official/articleshow/67221261.cms
[15] https://www.deccanherald.com/exclusives/illegal-sand-mining-wrecking.html

of Mines and Geology shows that from the blocks permitted by it, a total quantity of 30 million metric tonnes of sand (from all types of blocks - river sand, patta land, blocks allocated to government departments, and manufactured sand) is produced in the state. As per this, there is a difference of around 40 million metric tonnes of sand in comparison to the cement sold in the state."

29. We may consider further directions after noting facts of other states.

Sand Mining in the State of Maharashtra

30. In the case of Maharashtra, an affidavit has been filed by the State of Maharashtra on 20.2.2019 to the effect that the State Government is in the process of framing Sand Mining Policy for which a Committee has been constituted.

31. Our attention has also been drawn to an article published in The Hindustan Times dated 27.01.2019 under the title "Maharashtra registers most cases of illegal mining between 2013-17"[16] inter alia stating as follows:

"Maharashtra recorded 1,39,706 illegal mining cases between 2013 and 2017, the highest number in the country, revealed data submitted by the Union environment ministry before the Rajya Sabha on January 3.

However, the state had one of the lowest number of prosecutions in such cases. The state filed 712 first information reports (FIR) and one court case, while seizing around 1,39,000 vehicles used in illegal

[16] https://www.hindustantimes.com/india-news/maharashtra-registers-most-cases-of-illegal-mining-between-2013-17/story-2j69aqmsygzCcTBBB8emtN.html

63

mining operations and collecting Rs 267 crores as fines from offender.

India recorded 4,16,410 cases during the same time, which means Maharashtra accounts for 33.5% of all cases in the country. Uttar Pradesh recorded 36,054 illegal mining cases, Madhya Pradesh 46,193, Karnataka 33,390, and Goa had 3 cases. The information was submitted in response to a query on the environmental impact of illegal mining."

32. In view of above, further directions are required to be considered for the State of Maharashtra.

Sand Mining in the State of Punjab

33. Vide order dated 13.11.2018 in *O.A. No. 874/2018 News item published in "The Tribune " Authored by Arun Sharma Titled "Mounds of sand on Sutlej banks, mining mafia digs in"*, a report was sought on the allegation of large scale illegal mining on the bank of River Satluj in District Ropar in the light of directions vide order dated 04.09.2018 in Sudershan Das (supra) and other orders. Accordingly, a report has been received vide email dated 25.02.2019 confirming that illegal mining had taken place. The observations in the inspection report are as follows:

> *"1. No mining operation was observed during visit of the Committee at the mining sites located in the riverbed.*
> *2. The mining of minor minerals in the riverbed has taken place more than permitted depth of 3 meters, as specified in point no. 4(i) of Form – L appended to the Punjab Minor Mineral Rules, 2013, which is a violation of sustainable mining practice.*

3. *The specified boundaries or demarcation of mine lease area was not demarcated as required for checking illegal mining, substantiates the fact of illegal or unauthorized excavation of minerals.*
4. *From the existing natural level adjoining to the mining site, it we noticed that mining has been carried out in an unscientifically manner as:*
   a) *The mining of minor mineral has been done beyond the permitted depth.*
   b) *No strip of 7.5 m width of the lease boundary as seen left as per provisions of the Metalliferous Mines Regulations, 1961 in compliance to condition imposed in the Mining Plan approved by the State Geologist, Punjab, a serious violation for safety of banks.*
   c) *The contractor has not maintained slope height not exceeding 45 degree from the horizontal width along the boundaries of mining site in compliance to condition no. 12 of the letter vide which mining plan was approved, negligence towards slope stability.*
   d) *The contractor was not providing bench along the boundary of the mining site having height not exceeding 1.5 m and is width should not be less than the height as per condition no. 13 of the letter vide which mining plan was approve.*

1. *From the conditions of the area along the riverbed in revenue estate of village Baihara and Swarha, it seems that the mining has been carried out at the different locations in an unscientific way.*
2. *During the inspection, the impressions of heavy vehicles movement were observed. Also, it was found that road for movement of vehicle were in very bad shape as these roads have not been*

65

stabilized or metalled with any of construction material and no plantation was observed along the roads.

3. *The development of water sumps as well as erosion of banks due to unscientific mining within the riverbed are threat to river ecological system and make it prone to flooding conditions during full flow. Also, it may cause the course of river to change rapidly and meandering to a great extent.*
4. *No check post was observed during the visit along the routes leading to mining lease area.*
5. *As per stipulation of environmental clearance, the contractor is required to maintain safety and stability of river banks i.e. 3 m or 10% of the width of the river, whichever is more will be left intact as no mining zone. Since no embankment of the riverbed was noticed and there was no demarcation of the mining site, as such, compliance of the above stipulation of the Environmental Clearance could not be verified.*
6. *The contractor has neither done any plantation along with the lease boundary of mining site in compliance to the condition imposed in the approval letter of the Mining plan.*
7. *The stone crusher units nearby the riverbed were observed by the committee. The stone crusher units were observed to be non-operational during visit of the committee, but stock piling of crushed material is indicative of their operation. The heavy machineries like JCB, pokland machines, dumper etc. were observed around the river, which may have been use for illegal mining in the area. Hence, the possession of these types of machines and working of stone crusher units need to be regulated. This issue needs to be monitored by the State."*

34. The Committee further observed.

"The suggestions of the joint committee visit on 20.12.2018 in the report filed in OA no. 767 of 2018 titled as Dinesh Kumar Chadha versus State of Punjab & Others were as follows :

- *The mining activity within the riverbed should not be permitted without the preparation of Comprehensive Mining plan/ District Survey report as required in Sustainable Sand Mining Management Guidelines, 2016 issued by the MoEF by the State of Punjab with replenishment/ scientific study by an institute of national importance and prior recommendations of MoEF & CC.*

- *The State of Punjab may be asked to develop mechanism to stop the illegal extraction and transportation of riverbed material. The mechanism must include the environmental compensation for violators and vehicles used for the purpose to be seized along with prosecution of owners of such vehicles. Including cancellation of registration certificate of such vehicles.*

- *The District Administration may consider establishing the check post barrier at suitable site to check vehicles carrying the riverbed material and to maintain strict vigil over overloading vehicles involved.*

- *The Detailed Survey of river eco system comprising of identification of river stretches affected by unscientific mining should be carried out for preservation and exclusion of stretches from any type of extraction process or mining activity. In addition the auction of identified stretches may not*

be considered without approved annual replenishment report.

- *The restoration plan of river ecosystem in mine lease area should be enforced for minimizing the impacts of unscientific mining and to improve the riparian habitat. The State of Punjab can be asked to execute the restoration plan within time bound manner.*

- *The demarcation of auctioned mine lease area should be done urgently with pillars/fencing along with geo-referencing to protect the river ecosystem and to avoid bed degradation.*

- *The raw material to be imported, processed, dispatched and balance stock shall be regulated strictly as per the policy guidelines for registration and working of stone crushers in the State of Punjab issued by the Department of Industries and Commerce vide notification dated 19.03.2015.*

- *As regards to initiating action against the erring officials, the Heads of the concerned Departments should identify the erring officials who allowed to take place illegal mining and initiate action against these officials, after conducting detailed investigations.*

The same physical conditions have been noticed during the recent visit on 20.2.2019 at the mining sites located in the revenue estate of village Baihara and Swarha, as such, the suggestions may be considered by the court alongwith the followings:

- *The District Survey Report for the mining site in the area in order to identify depositions / aggradations stretches of the riverbed material should be prepared.*
- *Declaration of safety zones around infrastructures like National Highway, Bridge, Railway line etc. must be ensured for protection as per provisions of the Punjab Minor Minerals Rules, 2013.*
- *Replenishment report including time of replenishment for the mining area to be undertaken by the concerned Authorities for permitting mining.*
- *Strict vigilance to be implemented to ensure no illegal mining / transportation in the bed of river.*

As regards to facts noted regarding mining beneath the bridge on Sri Anandpur Sahib-Garshankar road, besides above, it is suggested as under:

(i) The Deptt. of Mining is required to ensure the compliance of stipulations of para 4 of Form 'L' appended to the Punjab Mining Minerals Rules, 2013 as regards to no mining area within a distance of 500m upstream /downstream of any high level bridge and 250m upstream / downstream of other bridges.

(ii) The Mining department jointly with Deptt. of Irrigation is required to rejuvenate the area near and beneath the above mentioned bridge so as to ensure safety of the same and these departments are required to take necessary safeguards for further safety of the said bridge."

35. In view of above, directions are called for to the State of Punjab to deal with the issue of sand mining.

Sand mining in the State of Uttar Pradesh and Haryana

36. O.A. No. 44/2016, Mushtakeem v. MoEF&CC & Ors., involved illegal mining in Uttar Pradesh and Haryana on riverbeds of Yamuna. The matter was disposed of vide order dated 05.09.2018, following directions dated 04.09.2018 in Sudershan Das (supra). In terms of order dated 05.09.2018, no report has been received from the State of Uttar Pradesh. Thus further directions are necessary. A report has been received from Additional Chief Secretary, Haryana vide email dated 05.04.2019 to the effect that the State of Haryana was following the guidelines and will implement revised Sustainable Sand Mining Guidelines issued by the Ministry of Environment, Forest and Climate Change (MoEF&CC) in terms of the order dated 04.09.2018, in *O.A No. 173/2018 (Earlier O.A. No. 89/2017 (EZ) (I.A. No. 76/2019), Sudarsan Das Vs. State of West Bengal & Ors.*

37. In view of the above, further directions are called for to the State of Uttar Pradesh and Haryana to deal with the issue of sand mining.

Sand Mining in the State of Madhya Pradesh

38. Though no case of the State of Madhya Pradesh is listed today, we have taken note of the problem sand mining in the State in O.A. No. 456/2018 Nityanand Mishra v. State of M.P. & Ors., which is pending before this Tribunal and sought report from Committee vide order dated 31.07.2018. Accordingly, a report is submitted & the same is on record of the said case. Extract from the report is as follows:

"Sand mining is directly affecting basking and nesting

habitats of species in SGS. Mining of sand from the riverbed and river banks will negatively alter the river morphology, will increase sedimentation and turbidity and also disrupt the lateral connectivity within the river. Studies have already shown condition of Son River to be at a critical level with severely compromised river flows. Sand mining will only result in compounding what is an already sub-optimal riverine habitat. Any further degradation of this habitat will potentially make Son River uninhabitable for some of the most threatened fauna in the country. The data from offence registers of SGS as depicted in table 1 does indicate that there has been an increase in the number of cases with respect to the illegal sand mining in the sanctuary area. The information is about cases that were caught and processed by the Forest Department. ***There are many cases that go unnoticed due to inadequate patrolling as everyone informs that one truck generates illegal revenue of Rs. 12,000 and per night 1000 trucks generate illegal revenue of Rs. 1,20,00,000."***

39. In view of above, further directions are necessary for the State of Madhya Pradesh to deal with the issue of sand mining.

Sand Mining in the State of Andhra Pradesh

40. We may also note that in the case of *Anumolu Gandhi V. State of Andhra Pradesh in Original Application No. 935/2018,* illegal sand mining causing damage to Krishna river in Vijayawada, Godavari river and their tributaries in the State of Andhra Pradesh and absence of remedial steps was considered. The Tribunal vide order dated 04.04.2019 directed the Chief Secretary of the State of Andhra Pradesh to forthwith prohibit all unregulated sand mining without following the procedure prescribed under the law in the judgment of the Hon'ble Supreme Court in Deepak Kumar v. State of Haryana. The Tribunal further directed Chief Secretary of the State to evolve a mechanism to assess and recover the cost of sand mining already incurred in the last three years and initiate

steps to recover compensation to meet the cost of restoration of environment. The Tribunal constituted a Committee comprising CPCB, MoEF&CC, National Institute of Mines, Dhanbad, IIT Roorkee and Madras School of Economics to undertake environment damage assessment within three months and furnish a report to this Tribunal by e-mail at ngt.filing@gmail.com.

41. In this light, further directions are called for to the State of Rajasthan and Andhra Pradesh to deal with the issue of sand mining.

Sand Mining in the State of Rajasthan and Himachal Pradesh

42. The problem of illegal sand mining contrary to the directions of the Hon'ble Supreme Court in Deepak Kumar vs. State of Haryana (supra) in the States of Rajasthan, Himachal Pradesh, Karnataka, Madhya Pradesh and Punjab was also considered by this Tribunal in Himmat Singh Shekhawat vs. State of Rajasthan & Ors. (O.A. No. 797/2018) vide order dated 15.03.2019. the Tribunal founds the reports submitted by the States to be unsatisfactory and accordingly directed furnishing of fresh action taken reports. The matter was directed to be listed on 11.07.2019. The said matter may now be listed on 23.07.2019 along with the present batch of matters.

Sand Mining in Bihar

43. This Tribunal vide its order dated 24.08.2018 in Amarshakti v. State of Bihar & Ors. O.A. No. 596/2018 dealt with the issue of illegal sand mining during monsoon in the rivers Son and Ganga at Koelbar and Patna in Bihar. The Tribunal directed the

Secretary, mines and minerals, Bihar to constitute a team comprising of officers of Mines and Minerals Department and District Magistrate and S.P. Patna to look into the allegations and report compliance to the Tribunal. Report dated 12.10.2018 was received from the Government of Bihar stated that 122 prosecutions were initiated and 297 persons arrested. 32 boats and 287 trucks were seized in District Saran. Action was also taken in District Bhojpur at Ara and District Vaishali at Hajipur. The Tribunal directed the Secretary, Government of Bihar to monitor the matter from time to time and continue to enforce the law.

Sand Mining in Uttarakhand

44. The issue of illegal sand mining in the State of Uttarakhand was also considered by this Tribunal vide its order dated 27.11.2018 in Anand Gopal Singh Bist v. State of Uttarakhand O.A. No. 751/2018 wherein, this Tribunal directed the District Magistrate Nanital and Principal Chief Conservator of Forest, Dehradun to jointly look into the matter. The Tribunal vide its order dated 14.02.2019 directed that the monitoring may continue and the Collector may ensure that Revenue Department performs its duty in accordance with law.

Sand Mining in other States

45. Illegal sand mining in violation of Sustainable Sand Mining Guidelines, 2016 has also been reported widely in the States of

Jammu and Kashmir[17], Goa[18], Kerala[19], Telangana[20] and Tamil and Nadu[21].

46. General directions may be necessary even for Bihar, Uttarakhand, Jammu and Kashmir, Goa, Kerala, Telangana and Tamil Nadu which may also apply to any other States facing the issue of illegal sand mining.

Issues

47. Main issues are:

(a) Revision of Sustainable Sand Mining Guidelines, 2016 by the MoEF&CC in the light of directions of this Tribunal vide order dated 04.09.2018 in Sudarsan Das (supra).

(b) Compliance of Sustainable Sand Mining Guidelines, 2016 as may be revised by MoEF&CC as above.

(c) Effective monitoring mechanism for preventive and remedial measures as directed in orders of this Tribunal, including surveillance system and recovery of compensation.

(d) Directions in individual cases listed today.

(e) Scale of compensation

48. We may now deal with the issues involved and directions required.

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[17] https://greaterkashmir.com/article/news.aspx?story_id=309365&catid=2&mid=53&AspxAutoDetectCookieSupport=1

18 https://timesofindia.indiatimes.com/city/goa/govt-is-ignoring-illegal-sand-mining/articleshow/67908428.cms

[19] Order dated 29.03.2019 in News Item Published In "Indian Express" Authored by Vishnu Verma in O.A. No. 76/2019

[20] https://sandrp.in/2019/02/26/sand-mining-2018-telangana-and-andhra-pradesh/

[21] https://en.wikipedia.org/wiki/Sand_mining_in_Tamil_Nadu

Re (i): Revision of Sustainable Sand Mining Guidelines, 2016 by the MoEF&CC in the light of directions of this Tribunal vide order dated 04.09.2018 in Sudarsan Das (supra).

49. As noted in para 12 to 15 above, need for revision of Sustainable Sand Mining Guidelines, 2016 has been discussed by the Tribunal in order dated 04.09.2018. Further discussion is unnecessary. The 2016 Guidelines need revision in the light of report of High Powered Committee in September 2016, failure of Monitoring mechanism followed by State Boards, SEIIAs, DEIAAs and MSS system developed by Ministry of Mines & IBN with the assistance of BISAG and MAITY and other observations quoted in paras 12 to 15 above. Since no report has been received from MoEF&CC as per report dated 04.09.2018, the MoEF&CC may now take necessary steps in the matter in terms of order dated 04.09.2018 in *Sudersan Das* (supra) latest by June 30, 2019 and file compliance report by 15.07.2019.

Re (ii): Compliance of Sustainable Sand Mining Guidelines, 2016 as may be revised by MoEF&CC as above.

50. As noted earlier in paras 17, 23, 27, 31 and 35, States of West Bengal, Odisha, Gujarat, Karnataka, Maharashtra, Punjab, Haryana and Uttar Pradesh are required to follow SSMG, 2016 as may be revised by MoEF&CC and even other States where illegal sand mining is taking place. All such States may take steps in terms of orders dated 04.09.2018 in *Sudarsan Das v. State of West Bengal & ors*, 05.09.2018 in *Mushtakeem v. MoEF&CC & Ors.*, 13.09.2018 in *Satendra Pandey v. MoEF&CC* & Ors. and 16.01.2019 titled Compliance of Municipal Solid Waste

Management Rules, 2016. The Chief Secretaries may monitor and furnish reports as earlier directed on the subject of sand mining.

Re (iii): Effective monitoring mechanism for preventive and remedial measures as directed in orders of this Tribunal, including surveillance system and recovery of compensation.

51. We have found in the discussion above, particularly in paras 8 to 11, 20, 21, 23, 29, 32, 33, 36, 39, 41 and 43 with regard to factual position in various States that monitoring mechanism-preventive and remedial measures is not effective and illegal sand mining is continuing. The same needs to be reviewed in the light of above discussion. The States may review monitoring mechanism in terms of several directions of the Tribunal and guidelines of MoEF&CC. As regards monetory compensation, the same has to be not only equal to cost of mined material and penalty to evade royalty but also to meet cost of restoration and NPV of eco services fore gone forever. Seizure of vehicles or other equipment may be dealt with as per rules and directions in *Threat to life arising out of coal mining in South Garo Hills district* (supra).

Re (iv): Directions in Individual Cases Listed Today. For the discussion and observation hereinabove, case is made out for issuing directions following discussion on the subject.

52. In *Sudarsan Das (supra)* one of the directions was that the Chief Secretaries of West Bengal and Odisha will prepare a restoration plan in consultation with the Central Pollution Control Board (CPCB), Indian School of Mines, Dhanbad and the Respective State Pollution Control Boards (SPCBs). We are informed that Indian School of Mines, Dhanbad declined to comply with the

order. This may call for remedial action against defiance by the said institution. Order of this Tribunal is a decree of the Court and can be executed in the manner provided under Section 51 CPC by ordering civil imprisonment or adopting other norms. Violation of order of this Tribunal is also a criminal offence punishable by imprisonment and fine. The Head of the Department concerned is liable to be proceeded against. Thus, the Director Indian School of Mines, Dhanbad will have to be required to appear in person to explain why action be not taken for violation of order of this Tribunal. The State of West Bengal, Orissa, Punjab and Gujarat need to send further action taken reports by 30.06.2019.

53. The State of Uttar Pradesh has not complied with the order dated 05.09.2018. This must not be done by way of last opportunity till 30.06.2019, failing which coercive measures will be adopted. Responsibility for compliance will be of the Chief Secretary.

54. In O.A. No. 173/2018, in view of the fact that term of the oversight Committee headed by Justice Ramesh Kumar Merathia, former Judge, High Court of Jharkhand was six months which period is over, the said Committee may now conclude its proceedings and furnish its final report with findings and recommendations on or before April 30, 2019. Further directions in the matter may be considered on the next date.

Re (v): Scale of Compensation

77

55. We have held that the scale of compensation proposed by the State of Gujarat does not fully comply with the 'Polluter Pays' principle which envisages that polluter is required to pay for complete restoration of the environment. This principle has been articulated further by the Hon'ble Supreme Court of India in *T.N. Godavarman Thirumulpad vs Union Of India & Ors, (2006) 1 SCC 1* in the context of forests. In this matter, the Hon'ble Supreme Court appointed a committee of experts and following directions were given:

i. To identify and define parameters (scientific, biometric and social) on the basis of which each of the categories of values of forest land should be estimated.

ii. To formulate a practical methodology applicable to different biogeographical zones of India for estimation of the values in monetary terms in respect of each of the above categories of forest values.

iii. To illustratively apply this methodology to obtain actual numerical values for different forest types for each biogeographical zone in the country.

iv. To determine on the basis of established principles of public finance, who should pay the costs of restoration and /or compensation with respect to each category of values of forests.

v. Which projects deserve to be exempted from payment of NPV.

56. Similar criteria may have to be taken into account for arriving at an approximate scale of compensation. The compensation is to

58. We sum up our directions as follows:

a) MoEF&CC may now take necessary steps in the matter in terms of order dated 04.09.2018 in *Sudersan Das* (supra) latest by June 30, 2019 and file compliance report by 15.07.2019, as already directed.

b) The States of West Bengal, Gujarat, Karnataka, Maharashtra, Punjab, Uttar Pradesh, Haryana, Madhya Pradesh, Andhra Pradesh, Bihar, Uttarakhand, Jammu and Kashmir, Goa, Kerala, Telangana and Tamil Nadu and Himachal Pradesh may take steps in terms of orders dated 04.09.2018 in *Sudarsan Das v. State of West Bengal & ors,* 05.09.2018 in, 13.9.2018 in *Mushtakeem v. MoEF&CC & Ors.* and 16.01.2019 in Compliance of Municipal Solid Waste Management Rules, 2016. The Chief Secretaries may monitor and furnish reports as earlier directed.

(c) The States of West Bengal, Gujarat, Karnataka, Maharashtra, Punjab, Uttar Pradesh, Haryana, Madhya Pradesh, Andhra Pradesh, Bihar, Uttarakhand, Jammu and Kashmir, Goa, Kerala, Telangana and Tamil Nadu and Himachal Pradesh may review monitoring mechanism in terms of directions of the Tribunal and guidelines of MoEF&CC.

(d) The Director Indian School of Mines, Dhanbad may appear in person on 26.07.2019 to explain why action be not taken for violation of order of this Tribunal.

(e) The State of West Bengal, Gujarat, Karnataka, Maharashtra, Punjab, Uttar Pradesh, Haryana, Madhya Pradesh, Andhra Pradesh, Bihar, Uttarakhand, Jammu and Kashmir, Goa,

79

include not only the full value of the illegally mined material but also cost of restoration of environment as well as cost of ecological services foregone forever. It should be deterrent so as not to render such illegal activity profitable. In *Sudarsan Das Vs. State of West Bengal & Ors.* (Supra), it was held that full value of the material, the cost of restoration and the NPV should form part of the compensation to be recovered. There has also to be action against the polluters and the erring officers. The vehicles or any other equipment used for illegal mining are required to be confiscated and to be released only on payment of atleast 50% of the showroom value as laid down in *Original Application No.110(THC)/2012, Threat to life arising out of coal mining in South Garo Hills District v. State of Meghalaya& Ors.* This scale can then apply for all States, as far as possible.

57. We consider it necessary to constitute a Committee comprising representatives of the MoEF&CC, Central Pollution Control Board (CPCB), Indian Institute of Forest Management, Bhopal, Institute of Economic Growth Delhi and Madras School of Economics to prepare a scale of compensation, after including the above components which can then be adopted in whole of the country. The report may be furnished within three months to the Tribunal by email at ngt.filing@gmail.com. The nodal agency for compliance and coordination will be CPCB. The Committee may also take professional service of an expert/ institution in the matter if it so desires.

Conclusions

Kerala, Telangana and Tamil Nadu and Himachal Pradesh may send further action taken reports by 30.06.2019.

(f) The Committee in terms of para 59 above may furnish its report within three months to the Tribunal by email at ngt.filing@gmail.com

59. A copy of this order be sent to MoEF&CC, Central Pollution Control Board (CPCB), Indian Institute of Forest Management, Bhopal, Institute of Economic Growth, Delhi and Madras School of Economics, Chennai by email.

List the matter for further consideration on 26.07.2019.

Adarsh Kumar Goel, CP

K. Ramakrishnan, JM

Dr. Nagin Nanda, EM

April 05, 2019
Original Application No. 360/2015
With other connected matters
AS

Annexure - VI

Item Nos. 01 to 15 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 360/2015
With
Original Application No. 366/2015
(M.A. No. 02/2019 & M.A. No. 251/2019)
With
Original Application No. 368/2015
(M.A. No. 16/2019 & M.A. No. 170/2019 M.A. No. 213/2019)
With
Original Application No. 173/2018
(Earlier O.A. No. 89/2017 (EZ)
(I.A. No. 76/2019 & I.A. No. [illegible]/2019)
With
Original Application No. 874/2018
With
Original Application No. 44/2016
With
Original Application No. 517/2015
With
Original Application No. 550/2015
With
Original Application No. 530/2016
With
Original Application No. 272/2016
With
Original Application No. 481/2016
With
Original Application No. 540/2015
With
Original Application No. 90/2016
With
Execution Application No. [illegible]/2017
IN
O.A. No. 517/2015
With
Original Application No. 671/2017

National Green Tribunal Bar Association — Applicant(s)

Versus

Virender Singh (State of Gujarat) — Respondent(s)

WITH

National Green Tribunal Bar Association — Applicant(s)

Versus

82

Dr.Sarvabhoum Bagali
(State of Karnataka) Respondent(s)

WITH

Sudarsan Das Applicant(s)

Versus

State of West Bengal & Ors. Respondent(s)

With

News item published in "The Tribune " Authored by Arun Sharma
Titled "Mounds of sand on Sutlej banks, mining mafia digs in"

With

Mushtakeem Applicant(s)

Versus

MoEF & CC & Ors. Respondent(s)

With

Sandeep Kumar Applicant(s)

Versus

Ministry of Environment, Forests and
Climate Change & Ors. Respondent(s)

With

Virender Kumar Applicant(s)

Versus

Ministry of Environment, Forests and
Climate Change & Ors. Respondent(s)

With

Sandeep Kumar Applicant(s)

Versus

Ministry of Environment, Forests and
Climate Change & Ors. Respondent(s)

With
M/s Ganga Yamuna Mining Co. Applicant(s)

Versus

83

State of Haryana & Ors. Respondent(s)

With

Joginder Singh Applicant(s)

Versus

Ministry of Environment & Forest & Ors. Respondent(s)

With

Ved Pal Singh Applicant(s)

Versus

Ministry of Environment & Forest & Ors. Respondent(s)

With

Chander Mohan Uppal Applicant(s)

Versus

State of U.P. & Ors. Respondent(s)

With

Sandeep Kumar Applicant(s)

Versus

Ministry of Environment, Forest and Climate Change & Ors. Respondent(s)

With

Himmat Singh Shekhawat Applicant(s)

Versus

State of Rajasthan & Ors. Respondent(s)

Date of hearing: 08.01.2020

CORAM: **HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON**
HON'BLE MR. JUSTICE S.P WANGDI, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER
HON'BLE MR. SIDDHANTA DAS, EXPERT MEMBER

For Applicant(s): Mr. Raj Panjwani, Senior Advocate and Mr. Rahul Choudhary, Advocate
Mr. Aageny Sail, Advocate

For Respondent(s): Mr. Vikas Mahajan, Additional Advocate General For State of HP
Mr. Attin Shankar Rastogi, Advocate, Mr. Ravi Prasad, Additional Secretary and Mr. Sundeep Kumar, for MoEF&CC
Ms. Vipra Bhardwaj, Advocate for CPCB
Ms. Rukmani Bobde, Advocate for State of MP
Ms. Madhumita Bhattacharjee, Advocate for State of West Bengal
Mr. Darpan KM, Advocate for State of Karnataka
Mr. Ankit Verma, Advocate for State of UP
Mr. Rahul Khurana, Advocate for State of Haryana
Mr. Rakesh Kumar, Additional Director Mines, Govt. of Rajasthan
Mr. Shlok Chandra, Advocate for MoEF&CC

ORDER

1. Common question for consideration in this group of matters is the steps required to be taken for environment protection from unregulated sand mining in the States of Gujarat, Karnataka, Maharashtra, West Bengal, Odisha, Punjab, Haryana and Uttar Pradesh. The issue is common even with regard to States who are not party to these proceedings.

2. Vide order dated 04.09.2018 in *O.A. No. 173/2018*, the issue of illegal sand mining on the banks of river Swaran Rekha on Orissa – West Bengal Border was considered in the light of material on record and it was found that illegal sand mining was going on without requisite safeguards and in violation of Sustainable Sand Mining and Management Guidelines, 2016. Further, High Powered Committee constituted under the orders of this Tribunal headed by Secretary, MoEF&CC gave a report in September 2016 suggesting further safeguards. The said report was accepted by this Tribunal and it was directed that the said suggestions were required to be incorporated in the Notification dated 15.01.2016 by which Sustainable Sand Mining and Management Guidelines, 2016 were notified.

85 4

Monitoring mechanism was also required to be straightened. Final directions to the MoEF&CC in the said order are quoted below for ready reference:

> *"25. In view of above discussion, we are of the view that since the subject of mining is also required to be regulated for protection of environment and it is to take care of this requirement, MoEF&CC has issued directions from time to time under Section 3 and 5 of the Environment (Protection) Act, 1986. The MoEF&CC needs to revise its directions keeping in mind the following:*
>
> *i. Mining Surveillance System discussed in para 23 above be finalized in consultation with ISRO Hyderabad.*
> *ii. Safeguards suggested in Sustainable Sand Mining Guidelines published by the MoEF&CC in the year 2016.*
> *iii. Suggestions in the High Power Committee Report.*
> *iv. Requirement of demarcation of boundaries being published in respect of different leases in public domain.*
> *v. Need to issue SOP laying down mechanism to evaluate loss to the ecology and to recover the cost of restoration of such damage from the legal or illegal miners. Such evaluation must include cost of mining material as well as cost of ecological restoration and net present value of future eco system services forgone.*
> *vi. Need to set up a dedicated institutional mechanism for effective monitoring of sand and gravel mining which may also take care of mining done without any Environmental Clearance as well as mining done in violation of Environmental Clearance conditions.*
> *vii. The Mining Department may make a provision for keeping apart atleast 25% of the value of mined material for restoration of the area affected by the mining and also for compensating the inhabitants affected by the mining.*
> *viii. One of the conditions of every lease of mine or minerals would be that there will be independent environmental audit atleast once in a year by reputed third party entity and report of such audit be placed in public domain.*
> *ix. In the course of such environmental audit, a three member committee of the local inhabitants will also be associated. Composition of three members committee may preferably include ex-servicemen, former teacher and former civil servant. The Committee will be nominated by the District Magistrate.*
>
> *26. Such steps may be worked out within two months and circulated to all States. The Mechanism may provide for a report of implementation from the concerned States every*

quarter. The matter may be reviewed after every six months by the MoEF&CC.

27. The direction with regard to setting up of dedicated institutional mechanism for monitoring of conditions of Environmental Clearance as granted under EIA Notification, 2006 in respect of sand and gravel mining as directed in para (vi) may be an Over-Encompassing Body to monitor the conditions of Environmental Clearance with respect to all development projects.

28. A copy of this order be sent to MoEF&CC by e-mail. Report of the steps taken by MOEF&CC may be furnished to this Tribunal by email at filing.ngt@gmail.com on or before 31.12.2018."

3. Vide order dated 13.09.2018 in *O.A. No. 186/2016, Satyender Pandey Vs. MoEF*, the Tribunal found that Notifications dated 15.01.2016, 20.01.2016 and 01.07.2016 to the extent procedure of environment impact assessment was diluted in violation of judgment of the Hon'ble Supreme Court in *Deepak Kumar Vs. State of Haryana & Ors.: (2012) 4 SCC 629* and also of this Tribunal in O.A. No. 123/2014 dated 13.01.2015 to be unsustainable. This same were also violative of Sustainable Sand Mining and Management Guidelines, 2016 to the extent of dispensing with the public hearing and the same was required to be revised. The direction of this of this Tribunal is quoted below for ready reference:

"25. The MoEF&CC shall, therefore, take appropriate steps to revise the procedure laid down in the impugned Notification dated 15th January, 2016 in terms of the above directions and observations so that it is conformity with the letter and spirit of the directions passed by the Hon'ble Supreme Court in Deepak Kumar (supra)."

The above directions remains to be implemented and on 16.12.2019 in E.A. No. 55/2018, further direction has been issued to ensure compliance failing which coercive measures may be initiated. Matter is listed on 31.01.2020.

87

4. The matter was comprehensively considered again on 05.04.2019 with reference to the following specific issues and directions were issued:-

> *"(a) Revision of Sustainable Sand Mining Guidelines, 2016 by the MoEF&CC in the light of directions of this Tribunal vide order dated 04.09.2018 in Sudarsan Das (supra).*
> *(b) Compliance of Sustainable Sand Mining Guidelines, 2016 as may be revised by MoEF&CC as above.*
> *(c) Effective monitoring mechanism for preventive and remedial measures as directed in orders of this Tribunal, including surveillance system and recovery of compensation.*
> *(d) Directions in individual cases listed today.*
> *(e) Scale of compensation."*

5. The matter was thereafter considered on 26.03.2019. With regard to non-compliance of order dated 04.09.2018 in *O.A. No. 173/2018*, it was observed:-

> *"None appeared for the MoEF&CC during hearing but while dictating the order, learned counsel for MoEF&CC suddenly appeared and only casual explanation furnished is that MoEF&CC has approached the Hon'ble Supreme Court. While seeking of reasonable time for compliance on the ground that the matter was pending in higher Court may stand on different footing, there is no justification for unreasonable delay for more than 9 months on the part of the MoEF&CC. Learned counsel for the applicant submitted that in absence of any stay, order of this Tribunal may be enforced by coercive measures. We find merit in the submission but before doing so, we give an opportunity for compliance of the directions and direct Additional Secretary concerned of MoEF&CC to remain present in person with the compliance report and an explanation as to why action be not taken against the person responsible for the default."*

6. The Additional Secretary, MoEF&CC is present in person and his only explanation is that the work involved is intricate and time consuming. We find absolutely no merit in the explanation. It is difficult to understand as to why a competent

team of officers in the Government cannot complete the exercise directed by the Tribunal to safeguard the interest of environment based mainly on High Powered Committee of the Ministry itself, if there is a will to work. The order of this Tribunal, in substance, merely requires incorporation of further safeguards based on High Powered Committee report and observations of this Tribunal into the Sustainable Sand Mining and Management Guidelines, 2016 The attempt appears to be to avoid carrying out the order of this Tribunal for reasons difficult to fathom. Such attitude does not augur well for effective rule of law.

7. As already noted, order dated 13.09.2018 in *O.A. No. 186/2016, Satyendra Pandey, supra* remains uncomplied by the MoEF&CC even though a period of more than one year has passed causing serious prejudice to the environment in continued violation of directions of the Hon'ble Supreme Court and this Tribunal. This is resulted in uncalled for confusion in the mind of statutory authorities dealing with the subject on the ground resulting in illegal mining and avoidable damage to the environment which needs to be urgently safeguarded. MoEF&CC as a responsible body should have taken necessary steps which are not at all difficult to restore effective impact assessment and safeguards in terms of observations of this Tribunal. This does not involve any long or complicated procedure. We do not see any difficulty in officers of MoEF&CC in understanding the issue or executing the orders of this Tribunal, if there is will to do so. We hope that the said order will now be positively complied before the next date, failing

89 ~

which this Tribunal will have no other option except for taking coercive action against the erring officers of the MoEF&CC. As already noted sufficient opportunity has already been given in the last more than one year and there has been total failure so far.

8. Every order of this Tribunal, subject to further order of a Constitutional Court, is a binding decree. Rule of law requires its strict compliance. Any violation thereof is a criminal offence under the National Green Tribunal Act, 2010. In the present case, either there is no intention to comply or no competence which is wholly undesirable situation. Only course left with this Tribunal in the circumstances is coercive measures as per law. We do hope that the same will now be positively complied with before the next dated. The Additional Secretary may remain present on the next date.

9. Other issue is the report of CPCB on the subject of fixing the amount of environmental compensation. Though the report has been furnished but it has deficiencies which have been pointed out during the hearing. The same may be rectified positively before the next date. The reports of the States about compliance will be considered on the next date.

List again on 31.01.2020.

Adarsh Kumar Goel, CP

S.P Wangdi, JM

Dr. Nagin Nanda, EM

Siddhanta Das, EM

January 08, 2020
O.A. No. 360/2015 and other connected matters
A

91

Annexure- V

Item Nos. 02 to 20 Court No. 1

BEFORE THE NATIONAL GREEN TRIBUNAL
PRINCIPAL BENCH, NEW DELHI

Original Application No. 360/2015

(With report dated 15.01.2021)

National Green Tribunal Bar Association Applicant

Versus

Virender Singh (State of Gujarat) Respondent

With

Original Application No. 366/2015

National Green Tribunal Bar Association Applicant

Versus

Dr. Sarvabhoum Bagali (State of Karnataka) Respondent

With

Original Application No. 368/2015

National Green Tribunal Bar Association Applicant

Versus

Dr. Sarvabhoum Bagali (State of Karnataka) Respondent

With

Original Application No. 173/2018
(Earlier O.A. No. 89/2017 (EZ)

Sudarsan Das Applicant

Versus

State of West Bengal & Ors. Respondent(s)

With

Original Application No. 874/2018

In Re: News item published in "The Tribune " Authored by Arun Sharma Titled "Mounds of sand on Sutlej banks, mining mafia digs in"

With

Original Application No. 44/2016

Mushtakeem Applicant

Versus

MoEF & CC & Ors. Respondent(s)

With

Original Application No. 517/2015

Sandeep Kumar Applicant

Versus

Ministry of Environment, Forests and
Climate Change & Ors. Respondent(s)

With

Original Application No. 550/2015

Virender Kumar Applicant

Versus

Ministry of Environment, Forests and
Climate Change & Ors. Respondent(s)

With

Original Application No. 530/2016

Sandeep Kumar Applicant

Versus

Ministry of Environment, Forests and
Climate Change & Ors. Respondent(s)

With

Original Application No. 272/2016

M/s Ganga Yamuna Mining Co. Applicant

Versus

State of Haryana & Ors. Respondent(s)

With

Original Application No. 481/2016

Joginder Singh Applicant

Versus

Ministry of Environment & Forest Respondent

With

Original Application No. 540/2015

Ved Pal Singh Applicant

Versus

Ministry of Environment and Forests & Ors. Respondent(s)

With

Original Application No. 90/2016

Chander Mohan Uppal Applicant

Versus

State of U.P. & Ors. Respondent(s)

With

Execution Application No. 40/2017
IN
O.A. No. 517/2015

Sandeep Kumar Applicant

Versus

Ministry of Environment, Forests and
Climate Change & Ors. Respondent(s)

With

Original Application No. 671/2017
(Earlier O.A.No.123/2014)

Himmat Singh Shekhawat Applicant

Versus

State of Rajasthan & Ors. Respondent(s)

With

Original Application No. 726/2018

Rupesh Pethe Applicant

Versus

State of M.P. & Ors. Respondent(s)

With

Original Application No. 456/2018
(Earlier O.A. No. 146/2014 (CZ)

Nityanand Mishra Applicant

Versus

State of M.P. & Ors. Respondent(s)

With

Original Application No. 1086/2018
(Earlier O.A.No.140/2014)

Nanga Ram Dangi Applicant

Versus

Secretary, Department of Environment &
Forests & Ors. Respondent(s)

With

Original Application No. 575/2019

Yaduraj Singh Jat Applicant

Versus

State of Rajasthan Respondent

Date of hearing: 26.02.2021

CORAM: HON'BLE MR. JUSTICE ADARSH KUMAR GOEL, CHAIRPERSON
HON'BLE MR. JUSTICE SHEO KUMAR SINGH, JUDICIAL MEMBER
HON'BLE DR. NAGIN NANDA, EXPERT MEMBER

Applicant:	Ms. Katyayni, Advocate in OA 1086/2018
Amicus Curiae:	Mr. Raj Panjwani, Senior Advocate with Mr. Aagney Sail, Advocate
Respondent(s):	Mr. Divya Prakash Pande, Advocate. for CPCB & MoEF & CC Mr. Raj Kumar, Advocate for CPCB in OA 726/2018 Ms. Soni Singh, Advocate for CPCB in OA 456/2018 Mr. Attin Shankar Rastogi, Mr. Balendu Shekhar & Mr. Shlok Chandra, Advocates for MoEF & CC Mr. Ankit Verma, Advocate for State of UP Mr. Rahul Khurana, Advocate for State of Haryana Mr. Darpan KM, Advocate for State of Karnataka Ms. Madhumita Bhattacharjee, Advocate. for State of West Bengal Mr. Vikas Mahajan, AAG for State of HP Mr. Maulik Nanavati, Advocate for State of Gujarat Ms. Soumya Priyadarshinee, Advocate for State of MP Ms. Sakshi Popli, Advocate for DPCC

ORDER

1. The issue for consideration in this group of matters relates to updation of enforcement and monitoring mechanism to control and regulate illegal sand mining (including riverbed sand mining) in the light of directions in the judgments of the Hon'ble Supreme Court, including in *Deepak Kumar v. State of Haryana & Ors.: (2012) 4 SCC 629* and *Goa Foundation v. Union of India & Ors.* (2014) 6 SCC 590 and orders of this Tribunal.

2. Some of the matters have been pending for about seven years while others have been tagged to the pending matters later, from time to time, in view of common question. We need not refer to the individual facts and all the earlier order. It will suffice to refer to some of the significant orders passed from time to time given in a tabular form as follows:

Sl. No.	Party name	Date of orders	Particulars
1.	OA No. 173/2018 Sudarsan Das v. State of West Bengal & Ors.	04.09.2018	Inter alia directing revision of monitoring mechanism by the MoEF&CC.
2.	OA No. 44/2016 Mushtakeem v. MoEF&CC & Ors.	05.09.2018	
3.	OA No. 186 of 2016 Satendra Pandey Vs. Ministry of Environment, Forest & Climate Change & Anr	13.09.2018	Inter alia disapproving dispensing with requirement of public hearing and requiring evaluation by DEIAA.
4.	OA 606/2018, Compliance of Municipal Solid Waste Management Rules, 2016	16.01.2019	Requiring the Chief Secretaries to monitor the subject of unregulated and unscientific sand mining
5.	O.A. No. 360/2015, National Green Tribunal Bar Association v. Virender Singh (State of Gujarat)	05.04.2019	Inter alia consideration of scale of compensation and revised monitoring mechanism
6.	OA No. 44/2016 Mushtakeem v. MoEF&CC & Ors.	19.02.2020	Inter alia modifying the mechanism for release of vehicles
7.	OA No. 360/2015 National Green Tribunal Bar Association v. Virender Singh (State of Gujarat)	17.08.2020	Inter alia considering the scale of compensation proposed by the CPCB
8.	O.A. No. 40/2020, Pawan Kumar v. State of Bihar & Ors.	14.10.2020	Inter alia engagement of experts from NABT/QCCI for preparation of DSR/ replenishment study
9.	O.A. No. 726 of 2018 Rupesh Pethe v. State of M.P. & Ors.,	04.11.2020	

3. We may now refer to the developments which have taken place during pendency of the matters and then proceed to decide the surviving issues, as further discussed in para 24:

a. enforcement of SSMG-2016 and EMGSM-2020,

b. compensation regime,

c. procedure for seizure and release of vehicles,

d. periodic interaction among the stakeholders as discussed in later part of the judgment,

e. designing and reviewing monitoring mechanism from time to time including grievance redressal.

'Sustainable Sand Mining and Management Guidelines, 2016' (SSMG-2016) and "Enforcement and Monitoring Guidelines for Sand Mining, 2020" (EMGSM-2020)

4. In the course of proceedings, the Ministry of Environment, Forest and Climate Change (MoEF&CC) issued 'Sustainable Sand Mining and Management Guidelines, 2016' (SSMG-2016) under the provisions of the Environment (Protection) Act, 1986 (EP Act, 1986) on 15.01.2016. Further, in the light of the September 2016 report of the High-Powered Committee (constituted by the Tribunal), headed by the Secretary, MoEF&CC and suggestions as noted in order dated 04.09.2018 in *OA 173/2018, Sudarsan Das v. State of West Bengal & Ors.*, the Tribunal directed revision of the guidelines.[1] Accordingly, the MoEF&CC has issued "Enforcement

[1] Para 25 of the said order is as follows:

"25. In view of above discussion, we are of the view that since the subject of mining is also required to be regulated for protection of environment and it is to take care of this requirement, MoEF&CC has issued directions from time to time under Section 3 and 5 of the Environment (Protection) Act, 1986. The MoEF&CC needs to revise its directions keeping in mind the following:

i. Mining Surveillance System discussed in para 23 above be finalized in consultation with ISRO Hyderabad.
ii. Safeguards suggested in Sustainable Sand Mining Guidelines published by the MoEF&CC in the year 2016.
iii. Suggestions in the High Power Committee Report.
iv. Requirement of demarcation of boundaries being published in respect of different leases in public domain.
v. Need to issue SOP laying down mechanism to evaluate loss to the ecology and to recover the cost of restoration of such damage from the legal or illegal miners. Such evaluation must include cost of mining material as well as cost of ecological restoration and net present value of future eco system services forgone.
vi. Need to set up a dedicated institutional mechanism for effective monitoring of sand and gravel mining which may also take care of mining done without any Environmental Clearance as well as mining done in violation of Environmental Clearance conditions.
vii. The Mining Department may make a provision for keeping apart atleast 25% of the value of mined material for restoration of the area affected by the mining and also for compensating the inhabitants affected by the mining.
viii. One of the conditions of every lease of mine or minerals would be that there will be independent environmental audit atleast once in a year by reputed third party entity and report of such audit be placed in public domain.
ix. In the course of such environmental audit, a three-member committee of the local inhabitants will also be associated. Composition of three members committee may

and Monitoring Guidelines for Sand Mining, 2020" (EMGSM 2020), uploaded on the website on 27.01.2020 and communicated to all the States. Salient features thereof will be noted later.

Issue of EC procedure being handled by SEIAA instead of DEIAA, after public hearing and other necessary steps, procedure for revision of DSR preparation and enforcement mechanism in States, including compensation regime and seizure and release of vehicles

5. Vide order dated 13.09.2018 in *O.A. No. 186/2016, Satyender Pandey Vs. MoEF*, further direction was issued against dispensing with the requirement of public hearing and evaluation by SEIAA in terms of the judgment of the Hon'ble Supreme Court in *Deepak Kumar, supra* thereby the guidelines/notification dated 15.01.2016 dispensing with such requirement was held to be hit by the judgment of the Hon'ble Supreme Court in *Deepak Kumar, supra* and thus not enforceable.

6. On 05.04.2019, the Tribunal conducted comprehensive review of the matter and noted following issues required consideration. Directions were issued with reference to the said issues:

> ***"(a) Revision of Sustainable Sand Mining Guidelines, 2016 by the MoEF&CC in the light of directions of this Tribunal vide order dated 04.09.2018 in Sudarsan Das (supra).***
> ***(b) Compliance of Sustainable Sand Mining Guidelines, 2016 as may be revised by MoEF&CC as above.***
> ***(c) Effective monitoring mechanism for preventive and remedial measures as directed in orders of this Tribunal, including surveillance system and recovery of compensation.***
> ***(d) Directions in individual cases listed today.***
> ***(e) Scale of compensation."***

7. Considering the extent of illegality in the process, apart from directing revision of the Guidelines as above, the Tribunal directed the

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preferably include ex-servicemen, former teacher and former civil servant. The Committee will be nominated by the District Magistrate."

States[2] to review their monitoring mechanism in the light of observations of this Tribunal in earlier orders, including orders dated 04.09.2018 in *Sudarsan Das v. State of West Bengal & Ors*, 05.09.2018 in *Mushtakeem v. MoEF&CC & Ors.* and 16.01.2019 in OA 606/2018, *Compliance of Municipal Solid Waste Management Rules, 2016*. **Though direction was issued to the States who were parties before the Tribunal, the directions are of general nature applicable to sand mining in all the State /UTs**. The Tribunal also considered compliance reports from different States after finding that the response of the State was not satisfactory.

Seizure and Release of vehicles involved in illegal mining

8. Another issue bearing on the enforcement mechanism is the action against the vehicles used in illegal sand mining. Seizure of such vehicles is required and release of seized vehicles lightly defeats the purpose of the coercive measures. Since the vehicles are in a way weapon of offence, the same cannot be dealt with in the manner disputed property is dealt with under section 451 Cr.PC. by releasing the same in favour of the ostensible owner by taking an entrustment/indemnity bond/*sapurdginama.* In Sujit Kumar Rana, (2004) 4 SCC 129 and order dated 26.03.2019 in Cr. A. 524/2019, State of Madhya Pradesh v. Uday Singh, it was held that special procedure for seizure and release of such vehicles prevails over the procedure under Section 451 Cr.P.C. This Tribunal earlier directed, in the case of illegal mining in Meghalaya that such vehicles should be released only on the payment of 50% of the showroom value. The same was affirmed by the Hon'ble Supreme Court in *2019 (8) SCC 177*. Similar order was passed by the Tribunal on 10.01.2019 in O.A. No. 670/2018, *Atul*

[2] The States of West Bengal, Gujarat, Karnataka, Maharashtra, Punjab, Uttar Pradesh, Haryana, Madhya Pradesh, Andhra Pradesh, Bihar, Uttarakhand, Jammu and Kashmir, Goa, Kerala, Telangana and Tamil Nadu and Himachal Pradesh

Chouhan v. State of U.P., which stands affirmed by the Hon'ble Supreme Court vide order dated 07.05.2019 in C.A. No. 1590/2019. **Thus, the procedure under Cr.P.C. for release of vehicles on *superdari* without stringent conditions would not apply in respect of action taken for enforcement of Sustainable Guidelines issued under the Environment (Protection) Act, 1986 (EP Act) and for enforcement of orders of this Tribunal under Section 15 of the National Green Tribunal Act, 2010 (NGT Act).** However, having regard to the difficulty expressed by the State that requirement to pay 50% of the showroom value of the vehicle was resulting in vehicles not being released at all, the earlier order was modified on 19.02.2020 to the effect that following scale of amount be recovered for release of the seized vehicles:-

Sr. No.	***Category of Vehicle***	***Penalty Amount***
1	*Vehicles/Equipments/Excavators with showroom value more than Rs. 25 lacs and less than 5 years old.*	*Rs. 4 lacs*
2	*Vehicles/Equipments/Excavators with showroom value more than Rs. 25 lacs and more than 5 years but less than 10 years old.*	*Rs. 3 lacs*
3	*For the remaining Vehicles older than 10 years/Equipments/ Excavators which are otherwise legally permissible to be operated and not covered by Serial No. 1 and 2.*	*Rs. 2 lacs*
Note – I:	*On repetition of the offence by the same vehicle/ equipment, Order dated 05.04.2019 will be applicable.*	
Note – II:	*The option of release may be available for a period of one month from the date of seizure and thereafter, the vehicles may be confiscated and auctioned.*	

9. Following further directions were issued :-

> *"6.* ***The State may issue an appropriate Office Order/Rule to the above effect and publish the same. Needless to say that any private contract between a financer and a debtor cannot affect the States' sovereign power to protect the environment and take incidental coercive measure for enforcement of rule of law. Lien of the State will override any private interest. The above compensation regime will be over and above any existing Rules or provisions. The amount collected may be***

remitted to the State PCBs/PCCs for being utilized for restoration of the environment.

7. The above course of action will be permissible to all the States at their option."

Scale of compensation for violations on polluter pays principle

10. Vide order dated 17.08.2020, the Tribunal considered the CPCB report dated 30.01.2020, in pursuance of earlier orders on scale of compensation to be recovered for violation of norms for mining on polluter pays principle and the matter was deferred for further consideration of such scale and further orders in the light of the EMGSM 2020. **On the issue of scale of compensation for violations, the Tribunal held that the same has to be calculated having regard to the polluter pays principle and not mere loss of royalty. This requires taking into account value of the illegally mined material and cost of restoration of the environment.** CPCB did the exercise by constituting an expert Committee. The Tribunal considered the report as follows:-

"8. The Committee considered two approaches:

(I) Approach 1: Direct Compensation based on the market value of extraction, adjusted for ecological damages.

(II) Approach 2: Computing a Simplified NPV for ecological damages.

9. In the first approach, the criteria adopted is:

- *Exceedance Factor (EF).*
- *Risk Factor (RF).*
- *Deterrence Factor (DF).*

10. Approach 1 is demonstrated by Table 1 as follows:

"

Table No. 01: Approach 1				
Permitted Quantity (in MT or m^3)	***Total Extraction (in MT or m^3)***	***Excess Extraction (in MT or m^3)***	***Exceedance in Extraction:***	***Compensation Charge (in Rs.)***
X	*Y*	*Z = Y-X*	*Z/ X*	*D * (1+RF + DF)* *Where D = Z x Market Value-of-the-material-per-MT-or-m^3*

				DF = 0.3 if Z/X = 0.11 to 0.40 DF = 0.6 if Z/X = 0.41 to 0.70 DF = 1 if Z/X >= 0.71	
				RF = 0.25, 0.50. 0.75, 1.00 (as per table 2)	”

11. Approach 2 is demonstrated by following formula:

“Till such time as data and information for a comprehensive NPV is worked out in a site specific manner to account for all (or atleast the major) ecological damages, a simplified NPV, proxied on the market value of the illegally extracted amount may be computed. In this case the NPV approach would imply that ***the total benefits from the activity of sand mining (as represented by the market value of the extracted amount) be deducted from the total ecological costs*** *imposed by the activity. In the absence of data on benefits and costs separately, we recommend a modification of the formula as shown below:*

Total Benefits(B) = Market Value of illegal extraction : D (refer Table 1)

*Total Ecological Costs = Market Value Adjusted for risk factor: D * RF (refer Table1).*

*For present purposes, it is assumed that the Benefits would accrue only in the first year (in which the extraction of the illegally mined material takes place), while the ecological costs would continue to be felt over a period of time. NPV is to be calculated for a period of 5 years on the net value, Σ (**C-B**), at a discount rate ranging from 8**%-5%**, varying in inverse with the risk factor. Thus, where the highest risk factor (say 1) is applicable, the discount rate applicable would be the lowest (say 5% in this case).”*

12. Final recommendation is as follows:

“Thus, it is recommended that the annual net present value (NPV) of the amount arrived at after taking the difference between the costs and the benefits through the use of the above approach, maybe calculated for a period of 5 years at a discount rate of 5% for mining which is in a severe ecological damage risk zone. The rationale for levying this NPV is based on expert opinion that reversal and/or restoration of the ecological damages is usually not possible within a short period of time and rarely is it feasible to achieve 100% restoration, even if the sand deposition in the river basin is restored through flooding in subsequent years. The negative externalities of the mining activity are therefore to be accounted for in this manner. Ideally, the worth of all such damages, including costs of those which can be restored should be charged. ***However, till data on site-specific assessments becomes available, this approach may be***

adopted in the interim. *In situations where the risk categorization charged. However, till data on site-specific assessments becomes available, this approach may be adopted in the interim. In situations where the risk categorisation is unavailable or pending calculation, the following Discount Rates may be considered:*

Severity	*Mild*	*Moderate*	*Significant*	*Severe*
Risk Level	***1***	*2*	*3*	*4*
Risk Factor	*0.25*	*0.50*	*0.75*	*1.0*
Discount	*8%*	*7%*	*6%*	*5%*

"

11. Annexure-A appended to the report gives the calculation as follows:

"Compensation Charge (Scenario II - explicit accounting of NPV)

Market Value of Illegally Mined Material (D) *5000*400 = 2000000/-*

Annual Value of Foregone Ecological Values *D*RF = 2000000/-*

- **Present Value** of Foregone **Ecological Values (@ 5% discount rate and over 5 years)**

PV **=** $\sum_{t=1}^{5} \frac{(D+RT)}{(1+r)t}$

= $\sum \frac{(2000000)}{(1+0.05)^1} + \frac{(2000000)}{(1+0.05)^2} + \frac{(2000000)}{(1+0.05)^3} + \frac{(2000000)}{(1+0.05)^4} + \frac{2000000)}{(1+0.05)^5}$

= Rs. 86,58,953/-

- *Net Present Value (after netting out market value of illegally mined material) - i.e., Total Compensation to be levied*

= *NPV=PV-D*
= *Rs. 66,58,953/-*

Compensation Charge in above case:

Approach 1 (no explicit accounting of NPV)	***Approach 2 (explicit accounting of NPV)***
D*(1+RF+DF)	***@ 5% discount rate and over 5 years***
Rs. 46,00,000/-	*Rs. 66,58,953/-*

"

12. The Tribunal directed undertaking of scenario analysis, as suggested on behalf of the applicant and to furnish a further report accordingly. Further report dated 12.10.2020 has been filed by the CPCB reiterating its earlier report. **We propose to approve approach-2 in the report.** Apart from the above, a report dated 15.01.2021 has been filed by

the Oversight Committee for the State of UP[3] to which reference will be made later.

Procedure for DSR/EC

13. Vide order dated 14.10.2020 in *O.A. No. 40/2020*, *Pawan Kumar v. State of Bihar & Ors.*, the issue of preparation of District Survey Report (DSR) by Experts was considered. Vide Notification dated 25.07.2018 issued by the MoEF&CC, under Section 3(2)(v) of the EP Act, 1986 amending EIA Notification dated 14.09.2006, procedure for preparation of DSR for sand mining/riverbed mining was laid down. **The DSR is crucial as it contains Environment Management plan, including the replenishment study and other safeguards and is the basis to consider the environment impact of mining based on which decision to grant the Environmental Clearance is taken**. The Tribunal held that for such crucial exercise, the **Experts should be out of those accredited by the National Accreditation Board of Education and Training/ Quality Control Council of India (NABT/QCCI) in terms of O.M. of MoEF&CC dated 16.03.2010**. Verification by the District Magistrate and evaluation by the SEAC was also necessary. Accordingly, following directions were issued in relation to a matter arising from the State of Bihar:-

> *"(ii) As the DEIAA is not functioning as a consequence of the decision of the Tribunal in Satendra Pandey (supra),* ***the DSR shall be prepared through a consultant(s) accredited by the National Accreditation Board of Education and Training/ Quality Control Council of India in terms of O.M. of MoEF&CC dated 16.03.2010.***
>
> *(iii)* ***The DSR so prepared shall be submitted to the District Magistrate who shall verify the DSR only in respect of the relevant facts pertaining to the physical and geographical features of the district which shall be distinct from the scientific findings based on the parameters prescribed in the SSMMG-2016. After such verification, the District Magistrate shall forward the DSR for examination and evaluation by the State Expert Appraisal Committee (SEAC) having regarding to the fact***

[3] constituted by this Tribunal to oversee compliance of environmental issues, on suggestions of the State Government.

that the SEIAA comprises of technical/scientific experts. The SEAC after appraisal of the report shall forward it to the SEIAA for consideration and approval if it meets all scientific/technical requirements.

(iv) ***While preparing the DSR, the MoEF&CC Accredited Agency/Consultant shall scrupulously follow the procedure and the parameters laid down under the SSMMG-2016 and EMGSM-2020 read in sync with each other****."*

14. Considering the above, vide order dated 04.11.2020 in O.A. No. 726 of 2018, *Rupesh Pethe v. State of M.P. & Ors.,* the Tribunal directed that the above direction ought to be followed pan India, as follows:-

> *"5.* ***The above direction may be followed by the State of MP also for the sake of uniformity.*** *Further information required to be furnished is about the extent of illegal mining, extent of action taken, including the compensation recovered, vehicles seized and other coercive measures and impact of such action. The State of M.P. may compile relevant directions on the subject including the binding order of any Courts or Tribunal. This exercise may be undertaken jointly by the Secretary Geology and Mining, Member Secretary State PCB and Member Secretary SEIAA. In light of above, the State may further revise its policy and exercise. Let further compliance status be furnished before the next date by e-mail at judicial-ngt@gov.in preferably in the form of searchable PDF/ OCR Support PDF and not in the form of Image PDF.*
>
> *6.* ***We are of the view that the above directions need to be followed by all other States where the issue of mining is relevant.***
>
> *7. A copy of this order be forwarded to the Chief Secretaries of all the States and UTs by e-mail for compliance."*

Adverse impact of unscientific/unregulated Sand Mining

15. It is undisputed that there is huge degradation of environment on account of unregulated sand mining remains which is otherwise lucrative activity. It poses threat to bio-diversity, could destroy riverine vegetation, cause erosion, pollute water sources, badly affecting riparian ecology, damaging ecosystem of rivers, safety of bridges, weakening of riverbeds, destruction of natural habitats of organisms living on the riverbeds, affects fish breeding and migration, spell disaster for the conservation bird

species, increase saline water in the rivers. It has direct impact on the physical habitat characteristics of the rivers such as bed elevation, substrate composition and stability, in-stream roughness elements, depth, velocity, turbidity, sediment transport, stream discharge and temperature. Increase in demand of sand has placed immense pressure in the supply of sand resource and mining activities were going on illegally as well as legally without requisite restrictions. Lack of proper planning and sand management disturbs marine ecosystem and upset the ability of natural marine processes to replenish the sand. The Hon'ble Supreme Court (in Deepak Kumar, supra) noted that core group was constituted by the MoEF&CC to examine the impact of minor minerals on riverbeds and ground waters. A draft report was prepared recommending mandatory preparation of mining plan on the pattern of mining plans for major minerals. Further recommendations are reclamation and rehabilitation of abandoned mines, proportion of hydro geo-logical balance for minerals below ground water table limiting depth of mining to 3 meter and identification on locations where mining should be permitted was required. There is need for identifying safety zones in the proximity of intendments. Thus, strict regulatory parameters were required for regulating mining of minor minerals. It was noted that in-stream mining lowers the stream bottom of rivers which may lead to bank erosion. Depletion of sand in the stream bed causes deepening of rivers which may result in destruction of aquatic and riparian habitats. It has impact on stream's physical habitat characteristics.

16. *In State (NCT of Delhi) v. Sanjay, (2014) 9 SCC 772*, at page 790, it was observed :

> ***"32.*** *The policy and object of the Mines and Minerals Act and Rules have a long history and are the result of an increasing awareness of*

the compelling need to restore the serious ecological imbalance and to stop the damages being caused to the nature. The Court cannot lose sight of the fact that ***adverse and destructive environmental impact of sand mining has been discussed in the UNEP Global Environmental Alert Service Report. As per the contents of the Report, lack of proper scientific methodology for river sand mining has led to indiscriminate sand mining, while weak governance and corruption have led to widespread illegal mining. While referring to the proposition in India, it was stated that sand trading is a lucrative business, and there is evidence of illegal trading such as the case of the influential mafias in our country.***

33. The mining of aggregates in rivers has led to severe damage to rivers, including pollution and changes in levels of pH. Removing sediment from rivers causes the river to cut its channel through the bed of the valley floor, or channel incision, both upstream and downstream of the extraction site. This leads to coarsening of bed material and lateral channel instability. It can change the riverbed itself. The removal of more than 12 million tonnes of sand a year from Vembanad Lake catchment in India has led to the lowering of the riverbed by 7 to 15 cm a year. Incision can also cause the alluvial aquifer to drain to a lower level, resulting in a loss of aquifer storage. It can also increase flood frequency and intensity by reducing flood regulation capacity. However, lowering the water table is most threatening to water supply exacerbating drought occurrence and severity as tributaries of major rivers dry up when sand mining reaches certain thresholds. Illegal sand mining also causes erosion. Damming and mining have reduced sediment delivery from rivers to many coastal areas, leading to accelerated beach erosion.

34. The Report also dealt with the astonishing impact of sand mining on the economy. It states that tourism may be affected through beach erosion. Fishing, both traditional and commercial, can be affected through destruction of benthic fauna. Agriculture could be affected through loss of agricultural land from river erosion and the lowering of the water table. The insurance sector is affected through exacerbation of the impact of extreme events such as floods, droughts and storm surges through decreased protection of beach fronts. The erosion of coastal areas and beaches affects houses and infrastructure. A decrease in bed load or channel shortening can cause downstream erosion including bank erosion and the undercutting or undermining of engineering structures such as bridges, side protection walls and structures for water supply.

35. Sand is often removed from beaches to build hotels, roads and other tourism-related infrastructure. In some locations, continued construction is likely to lead to an unsustainable situation and destruction of the main natural attraction for visitors—beaches themselves. Mining from, within or near a riverbed has a direct impact on the stream's physical characteristics, such as channel geometry, bed elevation, substratum composition and stability, instream roughness of the bed, flow velocity, discharge capacity, sediment transportation capacity, turbidity, temperature, etc. Alteration or

modification of the above attributes may cause hazardous impact on ecological equilibrium of riverine regime. This may also cause adverse impact on instream biota and riparian habitats. This disturbance may also cause changes in channel configuration and flow paths

…..Today, demand for sand and gravel continues to increase. Mining operators, instead of working in conjunction with cognizant resource agencies to ensure that sand mining is conducted in a responsible manner, are engaged in full-time profiteering. Excessive in-stream sand and gravel mining from riverbeds and like resources causes the degradation of rivers. In-stream mining lowers the stream bottom, which leads to bank erosion. Depletion of sand in the stream-bed and along coastal areas causes the deepening of rivers and estuaries and enlargement of river mouths and coastal inlets. It also leads to saline water intrusion from the nearby sea. The effect of mining is compounded by the effect of sea level rise. Any volume of sand exported from stream-beds and coastal areas is a loss to the system. Excessive in-stream sand mining is a threat to bridges, river banks and nearby structures. Sand mining also affects the adjoining groundwater system and the uses that local people make of the river. Further, according to researches, in-stream sand mining results in the destruction of aquatic and riparian habitat through wholesale changes in the channel morphology. The ill effects include bed degradation, bed coarsening, lowered water tables near the stream-bed and channel instability. These physical impacts cause degradation of riparian and aquatic biota and may lead to the undermining of bridges and other structures. Continued extraction of sand from riverbeds may also cause the entire stream-bed to degrade to the depth of excavation."

Need for regulation under the Water, Air and EP Acts by PCBs, apart from the Mining authorities under the Mining law

17. Again, in Goa Foundation, supra (prs 74-76) it was observed that **mining was required to be regulated not only by the Mining department but also by the PCBs under the Water and Air Act and by the MoEF under the EP Act. It is made clear that the environment laws override other laws and any provision to the contrary in the Mines Act will not stay in the way of enforcing the environment norms. In this regard reference may also be made to report of the Ministry of Mines entitled "Sand Mining Framework" which will not stand in the way of modified mechanism in accordance with this order.**

Salient features of the EMGSM-2020

18. We may note the salient features of the EMGSM-2020, which are supplemental to existing SSMG-2016 and seek to provide effective enforcement and monitoring from the stage of identification of source to its dispatch and end use which requires involvement of all stakeholders viz. Central Government, State Government, Leaseholders/Mine Owners, Distributors, Dealers, Transporters and Consumers (bulk & retail)**.** EMGSM refer to the judgment of the Hon'ble Supreme Court in *Deepak Kumar Vs. State of Haryana & Ors. (2012) 4 SCC 629* making EC mandatory irrespective of the area of mining lease, followed by monitoring in terms of the Environment Management Plan, using IT and IT enabled services. **Monitoring has to be with reference to quantity of mined material, transportation with a view to promote environmental protection, limit negative physiological, hydrogeological and social impacts underpinning sustainable economic growth.** Observations in the order of this Tribunal dated 04.09.2018 in O.A. 173/2018 in Sudarsan Das vs. State of West Bengal & Ors. has also been referred to as follows:

> *"There can be no two views that an effective institutional monitoring mechanism is required not only at the stage when Environmental Clearance is granted but also at subsequent stages".*
> *"The guidelines focus on the preparation of District Survey Report and the Management Plan" …*
> *We are of the view that all the safeguards which are suggested in sustainable sand mining guidelines as well as notification dated 15.01.2016 ought to be scrupulously followed." …*
> *It is a known fact that in spite of the above-suggested guidelines being in existence, on the ground level, illegal mining is still going on. The existing mechanism has not been successful and effective in remedying the situation." …*
> *Since there is an utter failure in the current monitoring mechanism followed by the State Boards, SEIAAs and DEIAAs, it is required to be revised for effective monitoring of sand and gravel mining and a dedicated monitoring mechanism be set up."*

Further reference has been made to the directions in the order dated 05.04.2019 requiring the 17 States, which were party before the Tribunal

viz. West Bengal, Gujarat, Karnataka, Maharashtra, Punjab, Uttar Pradesh, Haryana, Madhya Pradesh, Andhra Pradesh, Bihar, Uttarakhand, Jammu and Kashmir, Goa, Kerala, Telangana and Tamil Nadu and Himachal Pradesh, to follow the revised Guidelines and to review their respective monitoring mechanism. It is then stated that with the object of regulating the mining, the sources of sand and steps required are mentioned which provide for District Survey Report (DSR), Mining Plan, replenishment study, consideration of environment impact while granting EC, laying down conditions for EC, monitoring of transportation to the end user to ensure that only legally mined material is transported. There is need to balance between deposition and extraction of sand as per replenishment study, maintaining surveillance, using Unmanned Artificial Vehicles (UAVs)/Drone for reserves estimation, quantity estimation, land use monitoring. Details about all these aspects have been mentioned in the said Guidelines. With regard to post EC monitoring, there is a provision for environment audit, monitoring of sale and purchase by developing online portal and laying down the levels of monitoring i.e. Level 1- Reach/ Stockyard level monitoring, Level 2 - Transportation monitoring, Level 3 - End consumer monitoring/ bulk consumer, Level 4 - Indirect monitoring. Reference has then been made to the High-Powered Committee incorporating safeguards to be adopted by the project proponents. There is also provision for assessment of compensation for the ecological damage by the State/ PCB/ any other Authority. Inter District and Inter State boundaries are separately dealt with. The uniform monitoring mechanism stipulates:

" 9.4. ***Monitoring Mechanism***

xxx ……xxx……xxx……

1. *All precaution shall be taken to ensure that the water stream flows unhindered and process of Natural river meandering doesn't get affected due to mining activity.*

2. *River mining from outside shall not affect rivers, no mining shall be permitted in an area up to a width of 100 meters from the active edge of embankments or distance prescribed by the Irrigation department.*

3. *The mining from the area outside river bed shall be permitted subject to the condition that a safety margin of two meters (2 m) shall be maintained above the groundwater table while undertaking mining and no mining operation shall be permissible below this level unless specific permission is obtained from the Competent Authority. Further, the mining should not exceed nine-meter (9 m) at any point in time.*

4. *Survey shall be carried out for identifying the stretches having habitation of freshwater turtles or turtle nesting zones. Similarly, stretches shall be identified for other species of significant importance to the river ecosystem. Such stretch with adequate buffer distance shall be declared as no-mining zone and no mining shall be permitted. The regulatory authority as defined for granting Environmental Clearance, while considering the application of issuance of ToR and/or EC for the adjacent block (to non-mining zone) of mining shall take due precaution and impose requisite conditions to safeguard the interest of such species of importance.*

5. *District administration shall provide detailed information on its website about the sand mines in its district for public information, with an objective to extend all information in public domain so that the citizens are aware of the mining activities and can also report to the district administration on any deviation observed. Appropriate feedback and its redressal mechanism shall also be made operational. The details shall include, but not limited to, lease area, geo-coordinates of lease area and mineable area, transport routes, permitted capacity, regulatory conditions for operation including mining, environmental and social commitments etc.*

6. *A website needs to be maintain to track the movement of centralised sand mining and a Centralised server system should be made to manage the data related to sand mining across India.*

7. *The mineral concession holders shall maintain electronic weighbridges at the appropriate location identified by the district mining officer, in order to ensure that all mined minerals from that particular mine are accounted for before the material is dispatched from the mine. The weighing bridge shall have the provision of CCTV camera and all dispatch from the mine shall be accounted for.*

8. *The mineral movement shall be monitored and controlled through the use of transit permit with security features like printing on IBA approved MICR papers, Unique bar/QR, fugitive ink background, invisible ink mark, void pantographs and watermarks papers or through use of RFID tagged transit permits and IT /IT-enabled services. Such monitoring system shall be created and made operationalised by State Mining department and district level mining officer shall be responsible for ensuring that all legal and operational mines are connected and providing the requisite information on the system. Regular check and associated report shall be submitted to DLTF and uploaded on the website.*

9. ***State Government shall constitute a District Level Task Force (DLTF) under the Chairmanship of Deputy Commissioner/District Magistrate/Collector with Superintendents of Police and other related senior functionaries (District Forest Officer, District transport officer, Regional officer- SPCBs, Senior Officer of Irrigation Department, District Mining Officer) with one/two independent member nominated by the Commissioner concerned. The independent member shall be retired government officials/teacher or ex-serviceman or ex-judiciary member.***

The DLTF shall keep regular watch over the mining activities and movement of minerals in the district. The DLTF shall have its regular meeting, preferably every month to reconcile the information from the mining activity, and other observations made during the month and take appropriate corrective and remedial action, which may include a recommendation for revoking mining lease or environmental clearance. The DLTF may constitute an independent committee of the expert to assess the environmental or ecological damage caused due to illegal mining and recommend recovery of environmental compensation from the miner's concern. The recommendation may also include action under the provision of E(P) Act, 1986.

10. *The area not identified for mining due to restriction or otherwise are also to be monitored on a regular basis by the DLTF. Any observations of mining activity from the restricted area shall be reported and corrective measures shall be initiated on an urgent basis by the DLTF.*

11. *The dispatch routes shall be defined in the Environmental Clearance and shall be avoided through densely habituated area and the increase in the number of vehicle movement on the road shall be in agreement with the IRC guidelines / carrying capacity of the road. The alternate and dedicated route shall be explored and preferred for movement of mining to avoid inconvenience to the local habitat. The mining production capacity, by volume/weight, shall be governed by total permissible dispatch calculated based on*

the carrying capacity of dispatch link roads and accordingly, the production should be regulated.

12. *The movement of minerals shall be reconciled with the data collected from the mines and various Naka/check posts. Other measures may also include a general survey of the potential mineable area in the district which has not been leased/auctioned or permitted for mining due to regulatory or other reasons.*

13. *The location and number of check post requirement shall be reviewed by DLTF on a regular basis so that appropriate changes in location/number could be made as per the requirement. Such review shall be carried out on a regular basis for the district on inter-state boundary or district providing multiple passages between two districts of different states.*

14. The district administration shall compile the information from their district of the permitted and legal mined out minerals and other details and share such information and intelligence with the officials of the adjoining district (Inter or/and Intra State) for reconciliation. The information shall include the area of operation, permissible quantity, mined out minerals (production) the permitted route etc., and other observations, especially where the mine lease boundary is congruent with the district boundary. Such coordination meeting shall be held on a quarterly basis, alternatively in two district headquarters or any other site in two districts decided mutually by the District Magistrate.

15. The mining department shall include submission of an annual environmental audit report as one of the conditions in the mining lease agreement. The annual audit for each river bed mining lease shall be carried out and the audit report shall be uploaded on the website of district administration. The audit shall be carried out by an independent team of 3 members nominated by District Collector/Magistrate/Commissioner comprising of Ex-Serviceman, Ex-Government officials of repute, Professor or Person having experience of mining/environment. The guidelines and method of the audit shall reflect adequately the monitor-able parameters and output and reflect the compliance status with respect to the conditions imposed by the regulatory authorities including conditions of Environmental clearance.

16. *The in-situ and ex-situ environmental mitigative measures stipulated as EMP, CER, CSR and other environmental and safety conditions in mines including the welfare of labours shall properly reflect in the audit report.*

9.5 Suggestive additional requirements are

i. The requirement at the Mine Lease Site:

a. Small Size Plot (Up to 5 hectares): Android Based Smart Phone.
b. Large Size Plots (More than 5 hectares): CCTV camera, Personal Computer (PC), Internet Connection, Power Back up.
c. Access control of mine lease site.
d. Arrangement for weight or approximation of the weight of mined out mineral on the basis of the volume of the trailer of vehicle used.

ii. Scanning of Transport Permit or Receipt and Uploading on Server:

a. Website: Scanning of receipt on mining site can be done through barcode scanner and computer using the software;
b. Android Application: Scanning on mining site can be done using Android Application using a smartphone. It will require internet availability on SIM card;
c. SMS: Transport Permit or Receipt shall be uploaded on the server even by sending SMS through mobile. Once Transport Permit or Receipt get uploaded, a unique invoice code gets generated with its validity period.

iii. Proposed working of the system:

The State Mining Department should print the Transport Permit or Receipt with security features and issue them to the mining leaseholder through the District Collector. Once these Transport Permits or Receipts are issued, they would be uploaded on the server against that mine lease area. Each receipt should be preferable with pre-fixed quantity, so the total quantity gets determined for the receipts issued. When the Transport Permit or Receipt barcode gets scanned and invoice is generated, that particular barcode gets used and its validity time is recorded on the server. So all the details of transporting of mined out material can be captured on the server and the Transport Permit or Receipt cannot be reused.

iv. Checking On Route:

The staff deployed for the purpose of checking of vehicles carrying mined mineral should be in a position to check the validity of Transport Permit or Receipt by scanning them using the website, Android Application and SMS.

v. Breakdown of Vehicle:

In case the vehicle break-down, the validity of Transport Permit or Receipt shall be extended by sending SMS by the driver in specific format to report the breakdown of the vehicle. The server will register this information and register the breakdown. The State can also establish a call center, which can register breakdowns of such vehicles and extend

the validity period. The subsequent restart of the vehicle also should be similarly reported to the server or call center.

vi. Tracking of Vehicles:

The route of the vehicle from source to destination can be tracked through the system using checkpoints, RFID Tags, and GPS tracking.

vii. Alerts or Report Generation and Action Review:

The system will enable the authorities to develop a periodic report on different parameters like daily lifting report, vehicle log or history, lifting against allocation, and total lifting. The system can be used to generate auto mails or SMS. This will enable the District Collector or District Magistrate to get all the relevant details and shall enable the authority to block the scanning facility of any site found to be indulged in irregularity. Whenever any authority intercepts any vehicle transporting illegal sand, it shall get registered on the server and shall be mandatory for the officer to fill in the report on action taken. Every intercepted vehicle shall be tracked.

The monitoring of mined out mineral, environmental clearance conditions and enforcement of Environment Management Plan will be ensured by the regulatory authority and the State Pollution Control Board or Committee. The monitoring arrangements envisaged above shall be put in place. The monitoring of enforcement of environmental clearance conditions shall be done by the Central Pollution Control Board, Ministry of Environment, Forest and Climate Change and the agency nominated by the Ministry for the purpose.

Some of the State has followed the SSMMG-2016 and has also improvised or customized on the provisions given therein, and are successfully in operation. Salient provision adopted at different stages of sand mining in the state of Tamil Nadu is given as ***Annexure VIII.***

9.6 Actions against illegal excavation and transport

Solapur district administration in Maharashtra had adopted a multi-pronged strategy to penalize the persons involved in illegal excavation and transport which resulted in a significant increase in revenue earned by the state. Following rules and procedures as mentioned in these guidelines will add to the costs of PP. Those involved in illegal activities are not required to bear these costs and this will make their supply in the market cheaper (though illegal). This will put the players running their business by following rules and procedures laid down by the government to disadvantage as far as the selling price is considered. Therefore, it is necessary to come down heavily on those involved in illegal excavation/transport, so that there is no incentive for players to abide by the rules.

The following action may be taken to achieve this deterrence against illegal business:

1. *The action should be taken under all legal options available simultaneously. Thus, after identifying the case of illegal excavation, storage and/or transport of minor minerals (including sand), fine should be levied as per the land revenue laws/code(s) of the state. In addition, FIR should be lodged in the police station under relevant sections of law including sec 379 IPC. In addition, action under the Motor Vehicle Act, 1989 and relevant rules should initiate to cancel/suspend the driving license of the driver and permit of the vehicle. Further, action should be initiated under provisions in the Income Tax Act, 1961 for unaccounted income and under the Central Goods and Services Act, 2017 for nonpayment of GST. (Earlier this was done under the state act pertaining to Value Added Tax/Sales Tax). Habitual offenders should also be taken up under local state laws for externment and/or preventive action. It is clarified that as per law, it is possible to take all actions under various laws simultaneously for one offence. What is prohibited in law is an action under the same law for the same act more than once.*

2. *The action should be taken against all persons responsible. Often, there is a tendency to penalize only the drivers of the vehicles. The mafia of illegal mining and transport is much bigger and drivers are only one part of the system. It is necessary to identify all those involved in the offence. It is usually not possible to reach the place of excavation without creating a motorable pathway up to the same through land which may be private land. Such role of such landowners needs to be looked into for each offence and proceeded against simultaneously. Further, the role of vehicle owners needs to be probed. Role of the person who allowed his land to be used for illegal excavation and storage should also be examined. Lastly, the person who purchases such sand should also be probed. The legal proceedings stated above needs to be initiated against all of these together. An attempt should be made to fix the financial responsibility in joint and several ways so that recovery is easier.*

3. *There may be discretion available in law about the extent of the penalty to be levied. If such discretion is very wide, then it is advisable that guidelines may be laid down to reduce such discretion in law for levying penalties. For example, in Maharashtra, Land Revenue Code, fine of any amount of penalty up to thrice the value of the sand can be levied. Solapur district administration had instructed Tahsildars and SDMs not to use discretion and levy the fine of three times the value. Availability of discretion makes junior level functionaries susceptible to pressures and it may also lead to corrupt practices.*

4. *It is emphasized that actions, as stated above, are most important to ensure that the IT-based system works. If these exemplary actions are not taken against everyone, it shall create a strong disincentive to those involved in legal excavation and transportation. For IT-based (or any other) legal system to work, it is necessary to ensure that illegal system stops working altogether."*

19. Several formats have been suggested in the Annexures, apart from salient provisions in the State of Tamil Nadu before execution of the mining lease and after execution of such lease including **judicious mined closure plan, reclamation, removal of sheds and maintaining of record for future reference.**

Compliance Status in States – Context of UP

20. We now refer to the Oversight Committee report dated 15.01.2021 for the State of UP with regard to status of compliance of Sustainable Guidelines as follows:-

"

S. No.	***Directions by Hon'ble NGT***	***Compliance Status (Yes/No)***	***Compliance Status***
1.	*Status of the progress in ensuring issues related to illegal sand mining in the State of Uttar Pradesh*	***Partially Complied***	*For effective control of illegal mining and transportation of minerals, a seven-member District level Task Force has been constituted under the chairmanship of District Magistrate vide Govt. Order no. 616/86-2018-371/2005 dated 20.03.2018.* *Under the Integrated Mines Surveillance System (IMSS), all the mine areas have been geo fenced. PTZ cameras at the mines have been installed. Weigh Bridges fitted with cameras have been installed at all mines and have been integrated with the Control Centre at Head Quarters. At present, there are 36000 registered vehicles and 310 Weigh Bridges have been established.*
2.	*Demarcation of boundaries for regulating grant of sand mining lease*	***Partially Complied***	*Rule-23 of the Uttar Pradesh Sub-Divisional (Avoidance) Rules, 1963 as amended, provides for the advertisement of an area with Geo-coordinates and Rule-17 mentions the Geo- coordinates of all boundaries of the area sanctioned. These are being followed by all the District Magistrates.*

3.	*Environmental Compensation imposed on leasing of minor minerals in any area to cover the restoration cost of environment and to compensate the victims*	***Partially Complied***	*There is provision for execution of mining lease deed only after demarcation under rule-17 of the Mining lease Approval Rules, 1963.*
4.	*Status of the constitution of a team to carry out demarcation by the Chief Secretary*	***Partially Complied***	*Under Rule-17 of the Uttar Pradesh Sub-Divisional (Avoidance) Rules, 1963, there is a provision for survey/demarcation of the area by an authorized officer/employee of the Directorate of Geology and Mining. A separate team is not justified at the level of Chief Secretary*
5.	*Mining in all blocks is undertaken as per provisions of EIA Notification, 2006; MOEF Notification dated 15.1.2016 and the Sustainable Sand Mining Management Guidelines, 2016*	***Partially Complied***	*i. Rule 34(4) of Rules-1963 contains the provision for obtaining Environmental Clearance before commencement of mining in the sequence of notification dated 14.09.2006 and the notification as amended from time to time.* *ii. According to the Sustainable Sand Mining Management Guidelines, 2016 issued by MOEF&CC, mining work is restricted from the riverbed during the monsoon season. Thus, mining work is restricted in the month of July, August and September in the State.*
6.	*No sand mining is permitted without due compliance of the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981 as well as regulations governing clearances by the Central Ground Water Authority*	***Partially Complied***	*Rule- 41(J)(1) of the 1963 Rules envisages that no mining operations in the leveled river bed shall be carried out beyond the depth of 3 meters or water level whichever is less/lower. The conditions mentioned in the Environmental Cleanliness Certificate issued by the State Level Environmental Impact Authority (SEIAA), are being followed.*
7.	*District authorities shall seize all sump pumps, other machinery, tools, vehicles, etc. used for carrying out illegal sand mining.*	***Partially Complied***	*Report awaited*
8.	*Any penalty imposed or not by concerned Department to cover the restoration cost of environment and to compensate the victims.*	***Partially Complied***	*The orders of Hon'ble NGT dated 18.02.2016 in OA No. 184/2013 Gurpreet Singh Baggha vs. MOEF, regarding recovery of penalty/ environmental damage from the concerned lease holders are being complied at district level.*
9.	*Status of a detailed restoration plan for the concerned river and its river beds*	***Partially Complied***	*Mining work is being done on the basis of approved mining scheme by including the restoration plan in the mining plan.*

10	*Status of the assessment done through Indian Council of Forestry Research and Education, Dehradun of the ecological damage on account of illegal mining by incorporating the given components:* *a) Cost of river bed material* *b) Cost of ecological restoration* *c) Net present value of the future ecosystem services.*	***Partially Complied***	*In OA No. 184/2013 Gurpreet Singh Bagga vs. MOEF, the action is being taken by conducting assessment of environmental damage in compliance with Indian Council of Forestry Research and Education, Dehradun.*
11	*Action against the polluters and the erring officers*	***Not Complied***	*Report awaited*
12	*Status of CCTV Cameras installation at mining points to verify the amount of sand extracted*	***Partially Complied***	*Rule-35(2) of Uttar Pradesh Minor Mineral Regulations, 1963 provides that the mining lease holder whose mining lease area is more than 5 hectares, shall constructs checkpost/gate and install 4 CCTV cameras capable of recording at 360° visibility at his own expense for monitoring. Under the supervision of the DMs.*
13	*Status of regular patrolling by the police to inspect the mining operations*	***Partially Complied***	*For effective control over illegal mining and transportation of minerals, a seven-member district level task force has been set up under the chairmanship of DM vide order no. 616/86-2018-371/2005 dated 20.03.2018. Deputy Superintendent of Police level officers of Police department are members of this task force. The mining areas are constantly monitored by this task force.*
14	*Status of daily reports regarding mining to be filed by SHO/ Mining officer to be sent to District Magistrate.*	***Partially Complied***	*According to the information received from the DM, Prayagraj in compliance of the order of Hon'ble NGT passed in OA No. 670/2018 in re: Atul Singh Chauhan vs. MOEF&CC and Ors., regular checking of illegal mining transportation is being done by the Task force constituted at the district level. The District Collector/ Senior Superintendent of Police, Prayagraj are regularly informed.*
15	*Status of vehicles confiscation*	***Partially Complied***	*In compliance of orders of Hon'ble NGT in OA No. 670/2018 in re: Atul Singh Chauhan vs. MOEF&CC and Ors., in district Prayagraj 06 chargesheets were filed in the financial year 2018- 19; 80 chargesheets filed in 2019-20 and in the year 2020-21 till the month of November, 2020, 150 FIRs and 214 cases have been filed in the competent Courts, including the order passed by Hon'ble NGT. Similar instructions have also been issued to the other districts regarding the above.*

16	*Status of EC imposed and realized by the CPCB till date in this regard*	***Partially Complied***	*In compliance of Order dated 05.04.2019 of Hon'ble NGT, Principal Bench in O.A. 360 of 2015 (13 clubbed cases), CPCB in NGT on 06.01.2020 the "Recommendations on Scale of Compensation to deal with the cases of illegal sand mining" were made by the Committee of Experts constituted by Hon'ble NGT. The Committee of Expert recommended two approaches regarding the scale of compensation to deal with the cases of illegal sand mining:* *1. Direct Compensation based on the market value of extraction, adjusted for ecological damages* *2. Computing a Simplified NPV for ecological damages.* *The above referred recommendations were initially taken up by Hon'ble NGT during the hearing on 08.01.2020 wherein Hon'ble NGT expressed prima facie deficiencies in the recommendations and directed for rectification of the deficiencies before the next date. Accordingly, the Committee of Experts reviewed and revised its recommendations, and CPCB filed in NGT on 30.01.2020 the revised "Recommendations on Scale of Compensation to deal with the cases of illegal sand mining" of the Committee of Experts constituted by Hon'ble NGT. The scale of compensation was calculated by adopting two approaches. For details of approach, I & II refer Appendix- VI. It was also suggested by the Hon'ble NGT vide its order dated 17/08/2020 to consider the suggestions of Shri Panjwani which were noted at point no 13 needs to be looked into by the same Committee and thereafter the Scale of Compensation finalized (Refer Appendix- VII).* *In compliance of the Hon'ble NGT direction, the matter was examined by the same expert Committee at CPCB, Delhi & found that more or less the formula suggested by committee and the methodology suggested by Shri Panjwani is similar except some of the factors. The details of same are noted at point no. 3 of the affidavits is submitted before the Hon'ble NGT by CPCB on 12.10.2020. Copy of same is enclosed as Appendix-VIII.*
17	*Status of EC imposed and realized by the UPPCB till date in this regard*	***Partially Complied***	*In compliance of Order dated 08.01.2020 of Hon'ble NGT in O.A. 360 of 2015 are given at Appendix -IX of the report*

18	*Status of setting up of dedicated institutional mechanism for monitoring of conditions of Environmental Clearance as granted under EIA Notification, 2006 in respect of sand and gravel mining.*	***Partially Complied***	*Under the supervision of the DMs in the districts, the conditions of the Environmental Clearance Certificate are complied with by the PCBs/ Departmental officers. A separate institutional mechanism has been established for the same.*
19	*Safeguards based on High Powered Committee report and observations into the Sustainable Sand Mining and Management Guidelines, 2016.*	***Partially Complied***	*MOEF& CC is following the Sustainable Sand Mining Management Guidelines, 2016. (Refer Appendix- X)*
20	*Necessary steps have been taken by District Administration for the effective monitoring mechanisms for preventive and remedial measures including surveillance system for recovery of compensation.*	***Not Complied***	*Action will be taken after necessary amendments in environmental regulations. As per information given by the Mr. A.K. Tiwari, UPPCB on 07.01.2021 that: Comments: In compliance of Hon'ble NGT order dated 17.08.2020 in OA No. 360/2015 and as per provision of 'Enforcement & Monitoring Guidelines for Sand Mining' Jan., 2020 issued by MOEF&CC, Govt. of India, action is to be taken by concerned District Administration. (Refer Appendix- XI)*
21	*Necessary steps have been taken by MOEF & CC to restore effective impact assessment and safeguards; any action taken against the erring officers*	***Not Complied***	*Report awaited*
22	*Status of Chief Secretary filed the report regarding recovery of compensation (i.e. damage to environment)*	***Not Complied***	*Report awaited*

23	*Whether there is any progress towards amendments of the Act/Rules so that the Courts can order for the fine as ordered by Hon'ble NGT.*	***Not Complied***	*As per information given by the Mr. A.K. Tiwari, UPPCB on 07.01.2021 that: Comments: In compliance of Hon'ble Supreme Court Judgement dated the 27.02.2012 in I.A. No. 12-13 in Special Leave Petition (C) No. 19628-19629 of 2009, in the matter of Deepak Kumar etc. Vs. State of Haryana and Others and in compliance of Hon'ble NGT directions dated 04.09.2018 in O.A. No. 173/2018 in the matter of Sudarsan Das Vs. State of West Bengal, MOEF&CC, Govt. of India has issued 'Enforcement & Monitoring Guidelines for Sand Mining' Jan., 2020 which has the following provisions regarding illegal mining:* *"As per the provision of 23 (C) of MMDR Act, the State Government is empowered to make rules for preventing illegal mining, and transportation & storage of illegal minerals. All such mining which qualifies under illegal shall be dealt with in the provision of MMDR Act the concern authorities".* *In the above circumstance the necessary amendments in Mining Regulation/ The Uttar Pradesh SubDivisional (Avoidance) Rules, 1963 is to be initiated by the Mines & Geology Department, Govt. of U.P. (Refer Appendix- XI).*

Additional Information provided by Mines Department

1. ***The Mines Department has established a Command Centre at the Directorate of Geology and Mines at Lucknow from where they operate the Integrated Mines Surveillance System for the entire State. They are using Artificial Intelligence based Software and taking the help of Drones and Cloud Services for monitoring mining activity in the State. Drone Videography has been done in sensitive districts- Fatehpur, Banda, Prayagraj and Saharanpur. Besides the CCTV Cameras, they are using RFID tags to monitor the movement of vehicles.***

2. *They have made a provision in the Rules to blacklist a person for upto 2 years if found guilty of illegal mining/illegal transportation. So far 125 persons/firms have been blacklisted.*

3. *They have amended the Rules to allow storage of minerals beyond 5Km radius from the riverbed. This has been done to prevent illegal mining from river bed under the alibi of storage.*

4. ***They have established a Vehicle Tracking System to check the misuse of Transport Pass and Overloading. To begin with, this system has been introduced in the most sensitive districts of Hamirpur, Banda, Fatehpur, Jalaun and Jhansi.***

5. *New areas have been identified based on survey conducted according to Sustainable Mining Guidelines and they are being included in the DSR.*

6. *Instead of the printed MM-11, online royalty payment has been introduced through E- MM- 11.*

7. *Security features have been introduced in E-MM 11 to check its misuse.*

8. *Transport of minerals even from stores is being regulated through electronic E- forms.*

Observation of the Oversight Committee: *The Committee felt that the compliance of the Mining Department needs to be verified by independent sources. CPCB and UPPCB are being directed by the Committee to jointly verify the compliance. The report would be submitted in three months time.*

VI. RECOMMENDATIONS

1. *There have been a number of complaints regarding illegal mining specially in Districts of Hamirpur, Banda, Fatehpur, Jalaun, Prayagraj, Saharanpur and Jhansi. The Oversight Committee, while enclosing the newspaper cuttings has asked for a status report from the Directorate of Mining, which so far has not been received.* ***Illegal Mining is mining done without a Mining Plan in utter violation of environmental norms and is a grave threat to ecology and environment.*** *The State Government should have a zero tolerance on illegal mining and the Directorate of Mining and District Administration should immediately enquire into all such cases and if found correct take stringent legal action against the guilty.*

2. *Environmental Clearance takes into account all the environmental concerns. Mining plan is the instrument through which it is enforced. However, for mining activity going on illegally, there is neither any EC nor any mining plan. Illegal mining invariably leads to reckless damage to environment. Hence, utmost efforts are required in surveillance, patrolling and enforcement.* ***Electronic surveillance through UAVs/Remote Sensing is a good surveillance option especially in areas where sand mafias are active. Night vision drones could be used for checking mining activity at night. Sensitive spots need to be identified and police presence- both static presence and dynamic patrolling needs to be beefed up there. DMs / SSPs be made directly responsible for checking illegal mining****.*

3. *DSRs need to be prepared very carefully. They should be based on Physical surveys and replenishment studies.* ***Since sand deposition is a dynamic issue, they need to be regularly updated. While awarding lease deeds, important environmental parameters like deposition and replenishment of sand, areas of erosion, distance from infrastructural structures need be considered.***

4. ***In the absence of replenishment studies and physical inspection before award, many times sites are awarded where there is no sand. The lease holder per force indulges in mining adjoining areas, some of which may be environmentally not very suitable. Before award of LOI, physical inspection should be mandatory.***

5. *Areas where only few leases are operative and the rest are not settled/surrendered need to be carefully analyzed.* ***There could be a chance of cartel formation and mining of sand illegally from other vacant mining plots under the garb of the operative lease. (In district Prayagraj, there is only one operative lease out of 51 leases).***

6. ***Storage Godowns should be at least 5 kms away from the river bank. Otherwise, illegal mining can be carried on under the garb of storage by the leaseholder himself.***

7. ***Geo-fencing of sites, their physical demarcation, allotment of geo-coordinates to all the pillars and their constant physical inspection and electronic surveillance is a must to ensure that the mining activity is as per the approved mining plan and no illegal mining, detrimental to environment, is going on.***

8. *There has to be a mechanism to ensure that the* ***actual mining activity conforms to the approved Mining Plan and the approved Environment Management Plan (EMP). Besides the statutory system of Departmental inspections, there has to be a system of annual mandatory Environmental Audit by experts. Environment Department can empanel some experts/expert institutions with standard TORs and Remuneration terms which could be utilized by the Mines Department on a regular basis. This way the District Administrations can access good technical experts with standard conditions in a transparent way without bothering about tedious time-consuming tender formalities.***

9. *There has to be an effective mechanism for restoration of environment in case of its degradation due to mining.* ***A portion of the royalty could be reserved for it as Environment Restoration Fund. The Environment Department can empanel some reputed institutions 21 with standard terms for preparing environmental restoration plans which could be used directly by the Mining Department without the arduous formalities. These plans could be funded by the Environment Fund as mentioned above. Already a number of mineral rich districts like Sonbhadra have a sizeable District Mineral Fund at the disposal of the District Collector. However, since there is no mechanism available at the level of District Collector for preparation of Environment Restoration Plans, this fund is normally used for works other than environmental restoratio****n.*

10. All the mining activity should strictly comply with Provisions of EIA Notification 2006, Sustainable Sand Mining Guidelines, 2016; The Environmental Protection Act, 1986; The Water (Prevention and Control of Pollution) Act, 1974; The Air (Prevention and Control of Pollution) Act, 1981 and Regulations of Central Ground Water Authority.

11. Direction may be issued to the Principal Secretary, Mining to take immediate steps for amendment of rules so that the Courts may order the fine as ordered by the Hon'ble NGT."

Stand of State of MP

21. The State of MP has filed an affidavit on 13.01.2021 that necessary changes have been made in accordance with the directions of this Tribunal dated for procedure for granting EC in accordance with the directions of this Tribunal in the order dated 13.9.2018 in Satendra Pande, by constituting a Committee. Order dated 12.10.2020 was issued by the State of Madhya Pradesh on the subject. There is a proposal to amend the Minor Minerals Rules and also to introduce technology to prevent illegal mining using QR Code for transit passes, pool SMS facility to ascertain validity of electronic passes, google distance matrix to avoid multiple usage of single transit pass, web portal and mobile App to verify validity of electronic transit pass. It is not necessary to refer to the affidavits of other individual States in view of the fact that final and updated directions are now being issued in the light of which all the States/UTs are expected to take further steps in the matter.

Stand of State of Rajasthan

22. In the status report, filed by the State of Rajasthan on 16.10.2020, it is stated that the Chief Secretary Environment Cell has been established. It holds regular meetings with the District Magistrates. Meeting was also held with the Director General of Police (law and order), Secretary Home, Director Mines, all District Collectors, Dy. Conservators of Forest and other concerned officers. Directions have been issued for formation of SITs,

monitoring cases of illegal mining, setting up of special check posts on the routes used for illegal mining, ensuring CCTV surveillance, strict recovery of environmental compensation fee, etc. Directions have issued to District Magistrates to create awareness at Panchayat level. The Chief Secretary proposes proposed to issue comprehensive guidelines. Mining Department has also taken up a project for creating redressal portal and mobile app for reporting illegal mining.

Today's Consideration

23. The extent of challenge posed by illegal sand mining was noted by the Tribunal in the order dated 05.04.2019 in OA 360/2015 as follows:-

> *"8. Despite this, the menace of illegal sand mining in India continues unabated.* ***As per reports, the sand business in India employs over 35 million people and is valued at well over $126 billion per annum. In the year 2015-2016, there were over 19,000 cases of illegal minor minerals including sand in the country.[4] In Uttarakhand, a 115 years old bridge collapsed due to overloaded sand trucks. In Maharashtra, 26,628 cases of illegal sand mining were recorded in the year 2017. The State of Maharashtra has the highest number of cases of non-compliance of Sustainable Sand Mining Management Guidelines, 2016. The State of Kerala suffered hugely in 2004 Tsunami and 2018 floods which several report explain were aggravated by illegal sand extraction.[5] The issue of illegal sand mining is also rampant in the states of Goa[6], Bihar[7], Tamil Nadu[8], Uttarakhand[9], Telangana[10], Jammu and Kashmir[11] amidst others."***

24. In view of resume of above orders and responses, the issue which survives for consideration is enforcement of the 2016 and 2020 guidelines, read with orders dated 19.2.2020, 14.10.2020, 4.11.2020 and observations herein, by evolving appropriate comprehensive monitoring

[4] http://www.legalserviceindia.com/legal/article-73-why-is-illegal-sand-mining-harmful-.html
[5] https://sandrp.in/2019/03/01/sand-mining-2018-is-it-a-national-menace/
[6] https://timesofindia.indiatimes.com/city/goa/govt-is-ignoring-illegal-sand-mining/articleshow/67908428.cms
[7] https://www.firstpost.com/india/illegal-sand-mining-part-3-bihar-govts-attempted-crackdown-has-sent-prices-soaring-officials-face-axe-as-rivers-in-ruin-6008351.html
[8] https://en.wikipedia.org/wiki/Sand_mining_in_Tamil_Nadu
[9] https://sandrp.in/tag/uttarakhand-sand-mining/
[10] https://sandrp.in/2019/02/26/sand-mining-2018-telangana-and-andhra-pradesh/
[11] https://greaterkashmir.com/article/news.aspx?story_id=309365&catid=2&mid=53&AspxAutoDetectCookieSupport=1

mechanism, with designated accountable officers, grievance redressal mechanism, envisaging strict action against violators, including assessment and recovery of compensation for the violations, seizure of vehicles and review at higher levels in the State.

Compensation

25. In the light of discussion in para 12 above, having regard to the totality of the situation, w**e accept the report of the CPCB and direct that the scale of compensation calculated with reference to approach II be adopted by all the States/UTs. T**hough compensation assessment for damage to the environment is a dynamic concept, depending on variables, floor level formula can be worked out to avoid arbitrariness inherent in unguided discretion**. The CPCB may issue an appropriate statutory direction for the facility of monitoring and compliance to the Environment Secretaries of all the States/UTs who may forthwith evolve an appropriate mechanism for assessment and recovery of compensation in all Districts of the State. The recovered compensation may be kept in a separate account and utilized for restoration of environment by preparing an appropriate action plan under the directions of the Environment Secretary with the assistance of such individual/ institutions as may be considered necessary.**

Interaction for Effective enforcement

26. The above discussion shows that the problem has defied solution and unless tackled seriously, damage to the environment will continue. Clear road map is thus required with effective monitoring mechanism. Report of the Oversight Committee for UP and affidavit of the State of MP, the report from Rajasthan and some other States also show that effective

mechanism is lacking. For clarity on all issues, periodic interaction of stake holders, particularly the enforcement authorities is required. This will also facilitate engagement of accredited agencies/experts for preparing DSRs/replenishment studies. In the Central Government, the concerned authorities include Mining Ministry, Environment Ministry, Jalshakti Ministry and CPCB. In States, Departments of Mining, Environment, SEIAA, PCB and District Magistrates.

Enforcement of Monitoring Mechanism and review by the Chief Secretary at State level and Secretary MoEF&CC at National level

27. **We direct all the States/UTs to strictly follow the SSMG-2016 read with EMGSM-2020 reinforced by mechanism for preparation of DSRs (in terms of directions of this Tribunal dated 14.10.2020 in Pawan Kumar, supra and 04.11.2020 in Rupesh Pethe, supra), Environment Management Plans, replenishment studies, mine closure plans, grant of EC (in terms of direction dated 13.09.2018 in Satendra Pandey, supra), assessment and recovery of compensation (as per discussion in Para 25), seizure and release of vehicles involved in illegal mining (in terms of order dated 19.02.2020 in Mushtakeem, supra), other safeguards against violations, grievance redressal, accountability of the designated officers and periodical review at higher levels. As already noted, EMGSM-2020 contemplates extensive use of digital technology, including remote sensing.**

28. **We further direct that periodic inspection be conducted by a five-members Committee, headed and coordinated by the SEIAA and comprising CPCB (wherever it has regional office), State PCB and two expert members of SEAC dealing with the subject. Where CPCB regional office is not available, if MoEF&CC regional office is available, its Regional Officer will be included in the Committee.**

Where neither CPCB nor MoEF&CC regional office exists, Chairman, SEIAA will tie up with the nearest institution of repute such as IIT to nominate an expert for being included in the Committee. Such inspection must be conducted at least thrice for each lease i.e. after expiry of 25% the lease period, then after 50% of the period and finally six months before expiry of the lease period for midway correction and assessment of damage, if any. The reports of such inspections be acted upon and placed on website of the SEIAA. Every lessee, undertaking mining, must have an environment professional to facilitate sustainable mining in terms of the mining plan and environmental norms. This be overseen by the SEIAA. Environment Departments may also develop an appropriate mobile App for receiving and redressing the grievances against the sand mining, including connivance of the authorities and also a mechanism to fix accountability of the concerned officers. Recommendations of the Oversight Committee for the State of UP quoted earlier may be duly taken into account.

The mechanism must provide for review at the level of the Chief Secretary at least once in every quarter, in a meeting with all concerned Departments in the State. The Chief Secretary UP may ensure further action in the light of the report of the Oversight Committee.

Similarly, at National level, such review needs to be conducted atleast once in a year by the Secretary, Environment in coordination with the Secretaries Mining and Jalshakti Ministries the CPCB.

Publication of Annual Reports

29. **We further direct all the States/UTs to publish their annual reports on the subject and such annual reports may be furnished to**

MoEF&CC by 30th April every year giving status till 31st March. First such report as on 31.03.2022 may be filed with the MoEF&CC by all he States/UTs on or before 30.04.2022. The report may also be simultaneously posted on the website of the Environment Department of the States/UTs. Based on such reports, MoEF&CC may consider supplementing its Guidelines from time to time. The MoEF&CC may prepare a consolidated report considering the reports from the States/UTs and publish its own report on the subject, preferably by 31st May every year.

Interaction at National Level

30. **We direct the Secretary MoEF to convene a meeting in coordination with the CPCB and Mining and Jalshakti Ministries of Central Government and such other experts/individuals at National level and representatives of States within three months for inter-action on the subject which may be followed by such meetings being convened by the Chief Secretaries in all States in next three months. Holding of such meetings will provide clarity on enforcement strategies and help protection of environment.**

All the applications are disposed of. Individual issues may be gone into in accordance with the mechanism to be involved as above.

A copy of this order be forwarded to the MoEF&CC, CPCB, Secretaries, Ministries of Jalshakti and Mining, GoI, Chief Secretaries, Environment Secretaries, SEIAA and State PCBs/PCCs and District Magistrates of all the States/UTs by e-mail for compliance.

Adarsh Kumar Goel, CP

S.K. Singh, JM

Dr. Nagin Nanda, EM

February 26, 2021
Original Application No. 360/2015
and other connected matters
DV & A

No. CPCB/IPC-II/NGT-OA(360/2015)/2021/ 2027-2061   11 June, 2021

To,

The Environment Secretary,
(As per list)

Sub.: Direction under Section 5 of The Environment (Protection) Act, 1986 regarding development of mechanism for assessment and recovery of compensation as per Hon'ble NGT order dated-26.02.2021 in O.A. No. 360/2015-reg.

WHEREAS, Hon'ble National Green Tribunal (NGT) by order dated-26.02.2021 (Para 10 to 12 & 25) in O.A. No. 360 of 2015 (and other clubbed applications) has accepted the report of an Expert Committee constituted by NGT order regarding Scale of Environmental Compensation to deal with the cases of illegal sand mining, that was submitted by CPCB to NGT on 30.01.2020, and which was re-iterated in the report submitted by CPCB to NGT on dated-12.10.2020 (available at NGT website at the link*https://greentribunal.gov.in/news-update?title=360+of+2015*);

WHEREAS, Hon'ble NGT by the above mentioned order dated-26.02.2021 (Para 25) has directed that the scale of compensation calculated with reference to Approach II of the Expert Committee report dated-30.01.2020 be adopted by all the States/UTs and that the recovered compensation may be kept in a separate account and utilized for restoration of environment by preparing an appropriate action plan under the directions of the Environment Secretary with the assistance of such individual/ institutions as may be considered necessary;

WHEREAS, by the above mentioned order dated-26.02.2021 (Para 25), Hon'ble NGT has further directed CPCB to issue an appropriate statutory direction to Environment Secretaries of all the States / UTs for the facility of monitoring and compliance of above NGT direction;

AND WHEREAS, Central Government has delegated the power to issue directions under Section 5 of the Environment (Protection) Act, 1986 to CPCB also,

NOW THEREFORE, in compliance of above mentioned direction of NGT and in exercise of powers under Section 5 of the Environment (Protection) Act, 1986, you are hereby directed to evolve an appropriate mechanism for assessment and recovery of compensation in all Districts of the State and for utilization of the recovered compensation for restoration of environment by preparing an appropriate action plan, as per order dated-26.02.2021 of Hon'ble National Green Tribunal (Principal Bench) in OA No. 360/2015.

The action taken report in above reference may be provided to CPCB within one month.

केन्द्रीय प्रदूषण नियंत्रण बोर्ड
निर्गत...N Singh...
दिनांक...14/06/2021

(Naresh Pal Gangwar)
Chairman
o/c

Copy for information to:

1. **The Joint Secretary,** : for information, please
   IA-II Division,
   Ministry of Environment, Forest & Climate Change,
   Indira Paryavaran Bhawan,
   Jor Bagh Road, New Delhi – 110003

2. **The Member Secretary,** : for information, please
   SPCBs/PCCs
   (As per list)

(Prashant Gargava)
Member Secretary

o/c

S.No.	States/UTs	Address	
		Environment Secretary - Office	Member Secretary - Office
1.	Andaman & Nicobar Islands	The Environment Secretary, Department of Environment & Forest, O/o Secretary (G/A), Andaman & Nicobar Administration, Secretariat, Port Blair, ANDAMAN & NICOBAR	The Member Secretary, Andaman & Nicobar Islands Pollution Control Committee, Department of Science & Technology, Dollygunj Van Sadan, P.O. Haddo Port Blair – 744102 ANDAMAN & NICOBAR
2.	Andhra Pradesh	The Environment Secretary, Department of Environment, Forest, Science & technology, 4th Block, 1st Floor, Room No. 268, A.P. Secretariat Office, Velagapudi, ANDHRA PRADESH	The Member Secretary, Andhra Pradesh Pollution Control Board D. No. 33-26-14 D/2, Near Sunrise Hospital, Pushpa Hotel Centre, Chalamalavari Street, Kasturibaipet, Vijayawada – 520 010 ANDHRA PRADESH
3.	Arunachal Pradesh	The Environment Secretary, Department of Environment & Forest, Civil Secretariat, Itanagar – 791 111 ARUNACHAL PRADESH	The Member Secretary, Arunachal Pradesh State Pollution Control Board Govt. of Arunachal Pradesh, Department of Environment & Forests, Paryavaran Bhawan, Yupia Road, Papu Nalah, Naharlagun - 791 110 ARUNACHAL PRADESH
4.	Assam	The Environment Secretary, Department of Environment & Forest, Assam Secretariat, Block 'A', 2nd Floor Dispur, Guwahati – 781 006 ASSAM	The Member Secretary, Pollution Control Board- Assam, Bamunimaidam, Guwahati – 781 021 ASSAM
5.	Bihar	The Environment Secretary, Department of Environment, Forest & Climate Change, Van Vibhag Road, Nehru Nagar, Patliputra Colony, Patna - 800 013 BIHAR	The Member Secretary, Bihar State Pollution Control Board, Parivesh Bhawan, Plot No. NS-B/2, Paliputra Industrial Area, Patliputra, Patna – 800 023 BIHAR
6.	Chandigarh	The Environment Secretary, Department of Environment & Climate Change, MGSIPA Complex, Sector 26, CHANDIGARH – 160 019	The Member Secretary, Chandigarh Pollution Control Committee Paryavaran Bhawan, Ground Floor, Sector-19 B, Madhya Marg, CHANDIGARH – 160 019
7.	Chhattisgarh	The Environment Secretary, Department of Environment, Mahanadi Bhawan, Mantralaya, Mahanadi Bhawan, Atal Nagar, Nava Raipur- 492 001 CHHATTISGARH	The Member Secretary, Chhattisgarh State Environment Conservation Board, Paryavas Bhawan, North Block Sector-19, Atal Nagar, Raipur - 492 002, CHHATTISGARH

8.	Dadra & Nagar Haveli, Daman & Diu	The Environment Secretary, Department of Environment & Forest Secretariat, Daman, Fort Area, Post Office Moti Daman – 396 220 DAMAN & DIU	The Member Secretary, Pollution Control Committee, UTs of Daman, Diu and Dadra & Nagar Haveli Fort Area, Court Compound, Moti Daman - 396 220 DAMAN & DIU
09.	Delhi	The Environment Secretary, Department of Environment, 6th Level, Delhi Secretariat, IP Estate, DELHI – 110 002	The Member Secretary, Delhi Pollution Control Committee, Government of N.C.T. Delhi 4th Floor, ISBT Building, Kashmere Gate, DELHI-110 006
10.	Goa	The Environment Secretary, Department of Environment and Climate Change , 4th Floor Dempo Towers, Patto - Panaji - 403 511. GOA	The Member Secretary, Goa State Pollution Control Board Nr. Pilerne Industrial Estate, Opp. Saligao Seminary, Saligao - Bardez Goa – 403 511 GOA
11.	Gujarat	The Environment Secretary, Forests & Environment Department, Block 14, 8 th floor, Sachivalaya, Gandhinagar - 382 010 GUJARAT	The Member Secretary, Gujarat Pollution Control Board Paryavaran Bhavan, Sector 10-A, Gandhi Nagar 382 010, GUJARAT
12.	Haryana	The Environment Secretary, Department of Environment & Climate Change, Seventh Floor, Main Secretariat, Sector 16, CHANDIGARH – 160 017	The Member Secretary, Haryana State Pollution Control Board C-11, Sector-6, Panchkula- 134109, HARYANA
13.	Himachal Pradesh	The Environment Secretary, Department of Environment, Science & Technology, Paryavaran Bhawan, Near US Club, Shimla – 171 001 HIMACHAL PRADESH	The Member Secretary, Himachal Pradesh State Pollution Control Board Him Parivesh, Phase-III, New Shimla – 171 009 HIMACHAL PRADESH
14.	Jammu & Kashmir	The Environment Secretary, Department of Forest, Environment & Ecology, 4th Floor, Mini Block Secretariat, Jammu, JAMMU & KASHMIR	The Member Secretary, J&K Pollution Control Board, Parivesh Bhawan, Shiekh-ul- Campus, Behind Govt. Silk Factory, Raj Bagh, Srinagar – 190 008 JAMMU & KASHMIR
15.	Jharkhand	The Environment Secretary, Department of Environment, Forest & Climate Change, Nepal House, Doranda, Ranchi – 834 002 JHARKHAND	The Member Secretary, Jharkhand State Pollution Control Board T.A. Bldg., HEC, P. O. Dhurwa, Ranchi - 834 004 JHARKHAND
16.	Karnataka	The Environment Secretary, Forest, Ecology and Environment Department,	The Member Secretary, Karnataka State Pollution Control Board “Parisara Bhavan”, #49,4th & 5th Floor, Church Street, Bangalore 560 001

		Secretariat, 4th Floor, M. S. Building, Bangalore – 560 001 KARNATAKA	KARANATAKA
17.	Kerala	The Environment Secretary, Department of Environment and Climate Change, 4th Floor, K.S.R.T.C Bus Terminal Thampanoor, Thiruvananthapuram – 695 001 KERALA	The Member Secretary, Kerala State Pollution Control Board Head Office, Pattom. P. O Thiruvananthapuram - 695 004 KERALA
18.	Lakshadweep	The Environment Secretary, Department of Environment and Forest, 1st Floor, Paryavaran Bhavan, Kavaratti, LAKSHADWEEP	The Member Secretary, Lakshadweep Pollution Control Committee, Department of Science, Technology & Environment, Kavarati – 682 555, LAKSHADWEEP
19.	Madhya Pradesh	The Environment Secretary, Housing and Environment Department, Paryavaran Parisar, E- 5, Arera Colony, Bhopal – 462 016 MADHYA PRADESH	The Member Secretary, Madhya Pradesh Pollution Control Board Paryavaran Parisar, E-5, Arera Colony Bhopal - 462 016 MADHYA PRADESH
20.	Maharashtra	The Environment Secretary, Environment & Climate Change Department, New Administrative Building, Madam Kama Road, Hutatma Chowak, Mumbai – 400 032 MAHARASHTRA	The Member Secretary, Maharashtra Pollution Control Board, Kalpataru Points, 3rd & 4th Floor, Sion Matunga Scheme Road No.6 Opp. Cine Planet, Sion Circle, Sion (E), Mumbai-400 022 MAHARASHTRA
21.	Manipur	The Environment Secretary, Directorate of Environment and Climate Change, Mini Secretariat Rd, opposite Superitendant of Police, Porompat – 795 010 MANIPUR	The Member Secretary, Manipur Pollution Control Board Lamphalpat, Imphal – 795 004, MANIPUR
22.	Meghalaya	The Environment Secretary, Forest and Environment Department, Secretariat Building, North Range, Forest Colony, Khasi Hills, Shillong – 793 001 MEGHALAYA	The Member Secretary, Meghalaya State Pollution Control Board, “ARDEN”, Lumpyngngad, Shillong – 793 014, MEGHALAYA
23.	Mizoram	The Environment Secretary, Department of Environment, Forest & Climate Change, Tuikhuahtlang, Aizawl, MIZORAM	The Member Secretary, Mizoram Pollution Control Board New Secretariat Complex, Khatla, Aizawl – 796 001, MIZORAM
24.	Nagaland	The Environment Secretary, Department of Environment, Forest & Climate Change,	The Member Secretary, Nagaland Pollution Control Board Signal Point, Dimapur,

		New Secretariat, Kohima, NAGALAND	NAGALAND
25.	Odisha	The Environment Secretary, Forest & Environment Department, Kharavel Bhavan, Bhubaneswar, ODISHA	The Member Secretary, Odisha State Pollution Control Board Paribesh Bhawan, A-118, Nilakantha Nagar Unit VIII Bhubaneswar – 751 012, ODISHA
26.	Puducherry	The Environment Secretary, Department of Science, Technology and Environment, III Floor, PHB Building Anna Nagar, PUDUCHERRY - 605 005	The Member Secretary, Puducherry Pollution Control Committee 'B' Block, Ground Floor, Chief Secretariat, PUDUCHERRY-605 001
27.	Punjab	The Environment Secretary, Department of Science, Technology and Environment, 6th Floor, Punjab Civil Secretariat-2, Sector 9, CHANDIGARH – 160 009	The Member Secretary, Punjab Pollution Control Board Vatavaran Bhawan, Nabha Road Patiala 147 001 PUNJAB
28.	Rajasthan	The Environment Secretary, Department of Environment, 4, Jhalana Institutional Area, Jhalana Doongri, Jaipur – 302 004 RAJASTHAN	The Member Secretary, Rajasthan Pollution Control Board, A-4, Institutional Area, Jalana Dungri, Jaipur 302 004, RAJASTHAN
29.	Sikkim	The Environment Secretary, Forest and Environment Department, Government of Sikkim Forest Secretariat Deorali - 737102 Gangtok, East Sikkim, SIKKIM	The Member Secretary, Sikkim State Pollution Control Board State Land Use & Environment Cell Govt. of Sikkim, Deorali Gangtok – 737 102 SIKKIM
30.	Tamil Nadu	The Environment Secretary, Department of Environment, No. 1, Jeenis Road, Panagal Building, Ground Floor, Saidapet, Chennai – 600 015 TAMIL NADU	The Member Secretary, Tamil Nadu Pollution Control Board 76, Anna Salai, Guindy Industrial Estate, Race View Colony, Guindy, Chennai – 600 032 TAMIL NADU
31.	Telangana	The Environment Secretary, Department of Environment, Forests, Science and Technology, Telangana Secretariat 5th Floor, Burgula Rama Krishna Rao Bhavan, NH 44, Hill Fort, Adarsh Nagar, Hyderabad – 500 063 TELANGANA	The Member Secretary, Telangana State Pollution Control Board Paryavaran Bhawan, A-III, Industrial Estate, Sanathnagar, Hyderabad – 500 018 TELANGANA
32.	Tripura	The Environment Secretary, Department of Science, Technology & Environment,	The Member Secretary, Tripura State Pollution Control Board Parivesh Bhawan, Pandit Nehru Complex

		Vigyan Prajukti O Paribesh Bhawan, P.N. Complex, Gorkhabasti, Agartala – 799 006, West Tripura TRIPURA	P.O. Kunjaban, Gorkhabasti, Agartala – 799 006 TRIPURA
33.	Uttar Pradesh	The Environment Secretary, Environment, Forest and Climate Change Department, Bapu Bhawan Secretariat, Vidhan Sabha, Lucknow – 226 001 UTTAR PRADESH	The Member Secretary, Uttar Pradesh Pollution Control Board IIIrd Floor PICUP Bhavan Vibhuthi Khand, Gomti Nagar, Lucknow – 226 020 UTTAR PRADESH
34.	Uttarakhand	The Environment Secretary, Department of Environment & Forest, 4, Subhash Road, Secretariat, 4th floor, New Building, Dehradun – 248 001 UTTARAKHAND	The Member Secretary, Uttarakhand Environment Protection & Pollution Control Board 29/20, Nemi Road, Dalanwala, Dehradun – 268 001 UTTARAKHAND
35.	West Bengal	The Environment Secretary, Department of Environment, 5th Floor, Pranisampad Bhawan, Block LB-II, Salt Lake, Sector III, Bidhannagar, Kolkata – 700 106 WEST BENGAL	The Member Secretary, West Bengal Pollution Control Board Paribesh Bhavan, 10-A, Block LA, Sector III, Salt Lake City, Kolkata-700 091 WEST BENGAL