

Request for consideration of project in upcoming 29th EAC Meeting agenda to be scheduled in March, 2018 for Environment Clearance of River Bed Mining Project of Bajri, Area 159.27 ha with production capacity 0.538 million TPA at Tehsil : Atru, District: Baran (Rajasthan) of Shri Manoj Jain

kushagra jain <kushagrajain194@yahoo.com>
Reply-To: kushagra jain <kushagrajain194@yahoo.com>
To: "s.kumar1958@gov.in" <s.kumar1958@gov.in>
Cc: "rb.lal@nic.in" <rb.lal@nic.in>, "amit.vashishtha@nic.in" <amit.vashishtha@nic.in>

- Ref:**
1. MoEFCC letter No. J-11015/428/2013-IA.II (M) dated 02.01.2017
 2. MoM of 5th EAC held on 25th-26th April, 2016
 3. ADS Reply submitted to MoEFCC on 17.11.2017
 4. Request mail dated 09.02.2018

Sir,

With reference to the aforesaid subject and reference matter; we would like to bring in to your kind notice that aforesaid mining project was considered (for EC) in 5th Meeting of the reconstituted EAC (Non - Coal Mining), held on 25th-26th April, 2016 & as per Minutes of Meeting displayed on MOEFCC website, project was recommended for Environment Clearance. Copy of MoM is enclosed herewith as **Annexure I**.

Thereafter, Letter was issued by MoEFCC vide letter dated 02.01.2017 (Copy enclosed as **Annexure II**) stating that **"Project Proponent shall first conduct a scientific replenishment study and submit the report before the EAC for further consideration of amount of production for mining of sand/bajri on yearly basis"**. Replenishment study report has been prepared by Department of Geology, University of Delhi and copy of Same was submitted to MoEFCC on 17.11.2017. Copy of receipt enclosed herewith as **Annexure III**. Therefore, we would like to humbly request you kindly consider our project in upcoming 29th EAC meeting agenda to be scheduled in Month of March, 2018.

Thanking you with regards,

Yours faithfully,

Manoj Jain.

Lessee

On Friday, February 9, 2018 12:55 PM, kushagra jain <kushagrajain194@yahoo.com> wrote:

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Thanking you with regards,

Yours faithfully,

Mnaoj Jain.

Lessee

On Friday, November 17, 2017 5:01 PM, kushagra jain <kushagrajain194@yahoo.com> wrote:

**Subject: Reg ADS Reply submission of ADS sought on 02.01.2017 for River Bed Mining Project of Bajri, Area 159.27 ha with production ca
Tehsil : Atru, District: Baran (Rajasthan) of Shri Manoj Jain**

To,

The Director (IA Division)
Ministry of Environment, Forest & Climate Change
Govt. of India, Indira Paryavaran Bhavan,
Jorbag Road, Aliganj,
New Delhi – 110 003

Subject- River Bed Mining Project of Bajri, Area 159.27 ha with production capacity 0.538 million TPA at Villages Kunjed, Mayta, Bichhals, Manyagan, Patna, Kawa Aaton, & Mothpur, Tehsil : Atru, District: Baran (Rajasthan) of **Shri Manoj Jain. – Environmental Clearance reg.**

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In this connection, we would like to request you kindly grant us the Environmental Clearance at the earliest.

Thanking you with regards,

Yours faithfully,
Mnaoj Jain.

Lessee

4 attachments



ADS Reply subm receipt.jpg
370K

 **1_MoM of 5th EAC Meeting.pdf**
1640K

 **2_ADS Letter.PDF**
395K

 **ADS Reply_Manoj Jain.pdf**
3320K

Shri Manoj Kumar Jain S/o Shri Nemi Chand Jain

Ref. No.:

Date: 17.11.2017

To,

The Director (IA Division)
Ministry of Environment, Forest & Climate Change
Govt. of India, Indira Paryavaran Bhavan,
Jorbag Road, Aliganj,
New Delhi – 110 003

Subject- River Bed Mining Project of Bajri, Area 159.27 ha with production capacity 0.538 million TPA at Villages Kunjed, Mayta, Bichhals, Manyagan, Patna, Kawai Lolahedi, Atru, Piplod, Degni Jagir, Aaton, & Mothpur, Tehsil : Atru, District: Baran (Rajasthan) **of Shri Manoj Jain. – Environmental Clearance reg.**

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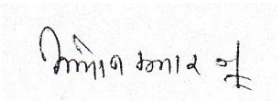
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Lessee

**GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE
(IMPACT ASSESSMENT DIVISION)
NON-COAL MINING SECTOR**

SUMMARY RECORD OF 5th MEETING OF THE RECONSTITUTED COMMITTEE OF THE EXPERT APPRAISAL COMMITTEE FOR ENVIRONMENTAL APPRAISAL OF MINING PROJECTS CONSTITUTED UNDER EIA NOTIFICATION, 2006.

The **Fifth meeting** of the Reconstituted Expert Appraisal Committee for Environmental Appraisal of Mining Projects (Non-Coal) of the Ministry of Environment, Forest and Climate Change was held during **April 25-26, 2016**. The list of participants is annexed.

After welcoming the Committee Members, discussion on each of the Agenda Items was taken up ad-seriatim.

Item No. 1:

(1.1). Circulation of the Minutes of the 1st EAC Meeting

The Minutes of the 4th Meeting of EAC held during March 21-22, 2016 were circulated.

Item No. 2:

Day 1: 25TH APRIL, 2016 (MONDAY)

(2.1). J-11015/392/2012-IA.II(M) Limestone Mine with production capacity 4.0 MTPA of M/s UltraTech Cement Ltd at Villages Moharenga, Math, Murra and Kharora, Tehsil Tilda, District Raipur, Chhattisgarh (689.048 ha)

M/s. UltraTech Cement Ltd. (UTCL) has proposed a new Limestone Mine (M.L. Area: 689.048 ha) with Production Capacity of 4.0 MTPA Limestone at Villages: Moharenga, Math, Murra and Kharora, Tehsil- Tilda, District - Raipur (Chhattisgarh). The Latitude and Longitude of the site falls between - 21°23'44.299" N to 21°25' 57.367" N and 81°52' 09.521" E to 81°54' 05.610" E respectively. Study area falls within the Survey of India Toposheet No. 64 G/14 & 64 G/15. UTCL has proposed limestone production of 4.0 MTPA and waste of 1.63 MTPA with total ROM of 5.63 MTPA.

(2.24). Mining of Bajri (Minor Mineral) with Production Capacity 0.538 million TPA (ROM) by Lessee Shri Manoj Kumar Jain, located at Villages– Kunjed, Mayta, Bichhals, Manyagan, Patna, Kawai Lolahedi, Atru, Piplod, Degni Jagir, Aaton, & Mothpur, Tehsil- Atru; District: Baran, Rajasthan (MLA: 159.27 ha) (Consultant: J.M. EnviroNet Pvt. Ltd.)-Consideration of Environmental Clearance

The proposal of Lessee Shri Manoj Kumar Jain is for Mining of Bajri (Minor Mineral) with Production Capacity 0.538 million TPA (ROM). The mine lease area is located at village (s)- Kunjed, Mayta, Bichhals, Manyagan, Patna, Kawai Lolahedi, Atru, Piplod, Degni Jagir, Aaton, & Mothpur, Tehsil- Atru; District: Baran (Rajasthan) in the area of 159.27 ha. The mine lease area lies on the Parwati, Parwan, Lhasi River bed & nallah. The Latitude and longitude of the mine lease area are 24°45'5.37"N to 24°59'33.24"N and 76°29'45.47"E to 76°44'56.13"E respectively. Study area lies on Survey of India toposheet numbers 54 C/12, 54 C/16, 54 D/5, 54 D/6, 54 D/9, 54 D/10, 54 D/13 & 54 D/14. The Project is located in Seismic zone-II.

The proposal for ToR was considered by the Expert Appraisal Committee in its 14th Meeting held on 22nd November, 2013 to determine the Terms of Reference (TOR) for undertaking detailed EIA study. The ToR was issued by MoEFCC vide letter No. J-11015/428/2013-IA.II (M) dated 29th January, 2014 & amendment in ToR dated 30th July, 2015. The Proponent submitted the EIA/EMP Report online to the Ministry for seeking environmental clearance after conducting Public Hearing.

The mine lease area is 159.27 ha which is as per khasra numbers issued by DMG, Rajasthan in Parwati, Parwan, Lhasi River bed & nallah. The Letter of Intent (LOI) over an area of 159.27 ha was granted by the Govt. of Rajasthan, vide letter No Anikha/ Jai/3(5)/ Bajri/P-2/2013/61 dated 24.01.2013. The Mining Plan has been approved by Director, Mines and Geology, Govt. of Rajasthan; vide letter no.SME/Kota/CC/MP/15/1912 dated 23.04.2015.

Mining will be by Opencast Manual cum Semi-Mechanized method. Excavation will be carried out up to a maximum depth of 3 meters from surface of deposit and not less than one meter above the water level of the River Channel whichever is reached earlier. The site elevation is 269 m – 285 m AMSL. Mining will be done leaving a safety distance from the banks. Mining will be done only during day time and completely stopped in monsoon season. No mining will be done in the zone of 45 m on either side of the structure/bridge. There will be construction of ramps,

temporary rest shelters during operational phase and these will be removed at the time of mine closure. The total water requirement is 30 KLD including water demand for domestic purpose, dust suppression and plantation development which will be met by purchasing from local villagers.

Mining will be done leaving safety barrier No benches will be made, Up to 70% width of riverbed will be utilized for mining. No mining within 45m on either side of existing culverts. About 42% of excavated area will be replenished naturally due to sediment inflow from catchment area. Mineral will be transported through road. Traffic Survey Analysis reported that 224 trucks trips will be used for transportation of minerals and LOS value will be 'A' as per IRC Standard. Road will be repaired regularly and maintained in good condition. A supervisor will be appointed to regulate the traffic movement near site. Speed breakers and signage will be maintained at the sensitive places.

Project Proponent reported that there is no National Parks/Wildlife Sanctuaries/Biosphere Reserves/Wildlife Corridors/Tiger/Elephant Reserves are located within the 10 km study area of the mine lease. No forest land is involved in Mining lease area. State Forest Department, vide letter no F.C.A/U.V.S/2015-16/13546, dated 30.11.2015 has confirmed that there is no forest land along with authenticated list of Flora & fauna. One schedule-I species namely *Pavo cristatus* (Peafowl) recorded in study area. Conservation Plan has been prepared which is under approval with CWLW. State Government of Rajasthan vide letter no. SME/Baran/CC/ML No 37/2012/2015/3562 dated 11.09.2015 has confirmed that the lease area does not fall in Aravali range.

The baseline data was generated for the period during December 2014 to February 2015. The analytical results of samples of air and water collected were within permissible limits. The Committee deliberated the baseline data collected by Project Proponent. Project proponent reported that there is no R&R Plan is applicable for this project as the mine lease area lies entirely on the river bed and there is no establishment on the site.

Public hearing for project was held on 11.12.2015 at 3:30 PM at Atal Sewa Kendra, Village- Kunjed, Tehsil Atru, District Baran (Rajasthan). Public hearing was presided by Shri Naresh Malav, RAS, Additional District Collector Baran. The representative of Regional Officer, Rajasthan State Pollution Control Board, Kotawas also present. The issues raised during the Public Hearing were also considered and discussed during the meeting.

which inter-alia about Village development, Green Belt Development and transportation. Action plan with budgetary allocation has been given against Points raised in Public hearing.

Project Proponent has conducted the replenishment study of Sand and using various methods and reported that the annual deposition rate will be about 42% of the annual abstraction rate. The Committee noted that the replenishment rate is less than the excavation of mineral accordingly; the Committee is of the view that Project Proponent shall decrease / stop the mining of Bajri, in case the replenishment is lower than the approved rate of production, till the replenishment is completed.

The Capital cost of the Project is Rs 25 Lakhs. An amount of Rs. 3.0 Lakhs has been earmarked towards Environmental Protection Measures and Rs. 1.5 Lakhs per annum towards recurring expenses. Rs. 6.0 Lakhs have been earmarked towards CSR activities. In accordance to Hon'ble Supreme Court of India's orders dated 25.11.2013, 24.02.2014 and 27.03.2014 (in civil Appeal no. 9703-9706 of 2013) production of 1,50,000 Tonnes of Bajri has been made during October, 2015 to March, 2016.

The Committee deliberated at length the information submitted by Project Proponent and **recommended the Proposal for Environmental Clearance for Mining of Mining of Bajri (Minor Mineral) with production capacity of 0.538 million TPA (ROM).**

The Committee **recommended additional specific conditions** viz.(i) Excavation will be carried out up to a maximum depth of 3 m from surface of sand deposit and 1 m above from the water level of the River channel whichever is reached earlier; (ii) Project Proponent shall decrease/ stop the mining of Bajri, in case the replenishment is lower than the approved rate of production, till the replenishment is completed. (iii) Project Proponent shall appoint an Occupational Health Specialist for Regular and Periodical medical checkup and once in six months and necessary medical care/preventive measures under taken accordingly. Recommendations of National Institute for Labour for ensuring good occupational environment for mine workers would also be adopted; (iv) Project Proponent shall appoint a Monitoring Committee to monitor the replenishment study, traffic management, levels of production, River Bank erosion and maintenance of Road etc.; (v) Transport of minerals shall be done either by dedicated road or it should be ensured that the trucks/dumpers carrying the mineral should not be allowed to pass through the villages; (vi) 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 Guidelines with respect to complying with traffic congestion and density; (vii) 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; (viii) The pollution due to transportation load on the environment will be effectively controlled & water sprinkling will also be done regularly. Vehicles with PUCC only will be allowed to ply. The mineral transportation shall be carried out through covered trucks only and the vehicles carrying the mineral shall not be overloaded. Project should obtain 'PUC' certificate for all the vehicles from authorized pollution testing centre; Washing of all transport vehicle should be done inside the mining lease; (ix) No mining shall be done within a distance of 7.5 meters from the periphery of agricultural fields, if any; and (x) Permanent pillars has to be constructed to demarcate width of extraction of ROM leaving 25% of River width from the bank with depth of 1.5m below the ground and 1.2 m above the ground to observe its stability.

(2.25). River Bed Mining Project of Bajri with production capacity of 0.749 million TPA by M/s Shri Naresh Gautam S/o Shri Purashottam Gautam, located at revenue Villages of Tehsil – Keshoraypatan, District–Bundi, Rajasthan (141.45 ha)

The Proposal of EC was already appraised by the EAC in an earlier meeting held during March 21-22, 2016.

(2.26). Banera Iron Ore Mine, Crushing & Beneficiation and Palletization Plant by M/s Rashtriya Ispat Nigam Limited (RINL), located at Village–Baran, Sultangarh, Banera, Nanodia, Kajlodia, Kishanpuriya & Lapia, Tehsil-Banera, District-Bhilwara, Rajasthan (MLA: 945.8575ha) (Consultant: MECON Limited)- Consideration of EC

The proposal of M/s Rashtriya Ispat Nigam Limited (RINL) is for opening of a opening of new mine @ 2 million TPA (ROM) along with Crushing & Beneficiation @ 2 million TPA and Palletization Plant @ 0.6 Million TPA in the MLA of 945.8575ha. The mine lease area is located at Village–Baran, Sultangarh, Banera, Nanodia, Kajlodia, Kishanpuriya & Lapia, Tehsil-Banera, District-Bhilwara, Rajasthan. The proposed ML area falls under Survey of India Toposheet Nos. 45 K/11 & 45 K/10 and bounded between 25°28'20.3982" N to 25°31'33.2292" N Latitude and 74° 37' 34.6188" E to 74° 41' 22.9812" E Longitude.

Speed Post

F. No. J-11015/428/2013-IA-II(M)
Government of India
Ministry of Environment, Forest and Climate Change
Impact Assessment Division

Indira Paryavaran Bhavan,
Aliganj, Jor Bagh Road
New Delhi-110 003

Dated: 2nd January, 2017

To,

M/s Manoj Kumar Jain
S/o Shri Nem Chand Jain
Kunjed, Vaya Bapawar,
Tehsil- Atru, District-Baran,
Rajasthan-325207

Sub.: River Bed Mining (Bajri) with production capacity of 0.538 MTPA by M/s Manoj Kumar Jain, located at Revenue Vilages of Tehsil Atru, District Baran, Rajasthan (159.27 ha.) regarding.

Sir,

This has reference to the above mentioned EC proposal for mining of River Sand/Bajri (Minor Mineral) in the State of Rajasthan. The Proposal of EC was earlier appraised before the Expert Appraisal Committee in its meeting held during April 25-26, 2016.

2. The matter was examined in the Ministry w.r.t. replenishment study and noted that the Ministry has issued the terms of reference and inter-alia mentioned a condition that the Project Proponent shall conduct a detailed replenishment study and submit the report along with the EIA/EMP. However, the Project Proponent has made a theoretical study based on Dendy Bolton's Replenishment Formula. In view of the above, the Ministry requested the EAC to recommend the amount of production on yearly basis based on a duly conducted scientific replenishment study before recommending Environmental Clearance. Accordingly the proposal to discuss the replenishment study issues related to sand/bajri mining projects have been re-considered before the EAC meeting held during October 24-25, 2016.

3. The Committee deliberated the issues and opined that Replenishment of the sand is a natural process in the perennial rivers. The sand moves along with the water streams and is deposited in the void created in the mined out areas. Replenishment rates vary depending on nature of watershed, nature of soil and rainfall etc. and mining beyond the natural replenishment rate results into damage of river bed leading to adverse environmental consequences. Mining proposals under the category of river mining are received for Environmental Clearance mainly from States such as Uttarakhand, Himachal Pradesh, Uttar Pradesh, Jammu and Kashmir, Haryana, Bihar and Rajasthan. Analysis of these proposals reveal that the proposals of sand mining from Rajasthan are not in perennial rivers. These are, in effect, paleo sand deposits and are not replenished annually during monsoon season. The mined out areas are not replenished adequately and may turn into permanent depressions.

4. The Committee noted that the EIA/EMP reports on sand mining proposals estimate replenishment rates based on theoretical Dendy-Boltan formula and not on actual replenishment studies. The Dendy- Boltan formula is not very useful to estimate replenishment rates at a particular stretch of a river and its application to cases such as those of Rajasthan, where rivers are not perennial, is even more problematic. In view of the above, there is a need, therefore, to treat the river sand mining proposals from Rajasthan differently from those of other States. **The Committee deliberated the issues w.r.t. replenishment study and is of the view that in case of Sand/Bajri mining projects from the State of Rajasthan, Project Proponents shall first conduct a scientific replenishment study and submit the report before the EAC for further consideration of amount of production for mining of sand/bajri on yearly basis. Therefore, the Committee deferred all such sand/bajri mining proposals of State of Rajasthan.**

5. The matter was examined in the Ministry and the undersigned is hereby directed to request you to kindly conduct a scientific replenishment study and submit the report to the Ministry for further consideration before the EAC.

Yours faithfully,


(Surendra Kumar)
Director

Tele-fax: 011-24695304

Copy to:

1. **The Secretary**, Department of Mines & Geology, Government of Rajasthan, Secretariat, Jaipur
2. **The Additional Principal Chief Conservator of Forests**, Ministry of Environment, Forest & Climate Change, Regional Office (CZ), Kendriya Bhawan, 5th Floor, Sector "H", Aliganj, Lucknow-226020.
3. **Guard File**
4. **MoEFCC website**


(Surendra Kumar)
Director

REPLENISHMENT STUDY

FOR

River Bed Mining Project of Bajri

(Area 159.27 ha)

with Production Capacity - 0.538 MTPA

Tehsil-Atru,

District - Baran (Rajasthan)

APPLICANT

Shri Majon Kumar Jain
S/o Shri Nemi Chand Jain

Village - Kunjer, Via- Bapawar,
Tehsil - Atru, District - Baran (Rajasthan)
Mobile No. 94141 90407, 9680031143
E-mail : rhm 1789@gmail.com

Introduction

Environmental destruction is the price mankind has to pay for unsustainable development. Alarming increase in indiscriminate sand mining has caused serious damage to the river system. As the demand for sand increases in industry and construction, leads to indiscriminate mining of sand from the rivers. The quantum of sand mined every year is several fold more than what flows down and accumulate in the riverbeds. This situation creates a serious environmental threat to the riverine system. On the other hand sand is an essential construction material and it gives employment to a large sector in our state. So the complete banning of sand mining is not a practicable solution to this multidisciplinary problem. A balanced amount of sand mining enables the river to maintain its stability. There were several studies reported in this regard, but most of the studies are related to environmental impacts of sand mining rather than the study on sand inflow. The studies and the guidelines set by the research organization on sand mining are based on the quantity of sand. Therefore a study is innovative to assess the sand inflow; which will help to assess the optimal sand removal. An analytical approach to estimate the sand inflow is a viable method. The present study is an analytical study to determine the sand inflow and there by the optimal amount of sand mining that can be permit from the different mining pits of River. This study can use for settling the guidelines for a sustainable future.

Objectives of the study

This is intended for use to achieve the following regulatory and management objectives:

- to ensure that sand extraction is carried out in a sustainable way
- to maintain the river equilibrium with the application of sediment transport principles in determining the locations, period and quantity to be extracted

Study Area

Chambal is one of the few indian rivers which flow from south to north. Chambal is a perennial river having its origin in the vindhyan range near Mhow Madhya Pradesh. It flows in a northeastern direction through Rajasthan state to meet with its major tributary Parbati river near Pali in Rajasthan. Parwan originates from Vindhyan ranges, enters the district near Harnawada Shahji and flowing through the central parts of the Atru tahsil, joins Kali Sindh near Rajgarh. During monsoon the river floods naturally and high extents of erosion and deposition of silt takes place. The maximum depth during this period is around 50 m. during dry season the river is 100-250 m wide and has a maximum depth of 20m. Parbati and Parwan river chosen for the study of sand mining. Parbati river is bedrock river and the substrate ranges from mud and silt to sand and rock.

River Bed Mining Project of Bajri, Area 159.27 ha with production capacity 0.538 million TPA

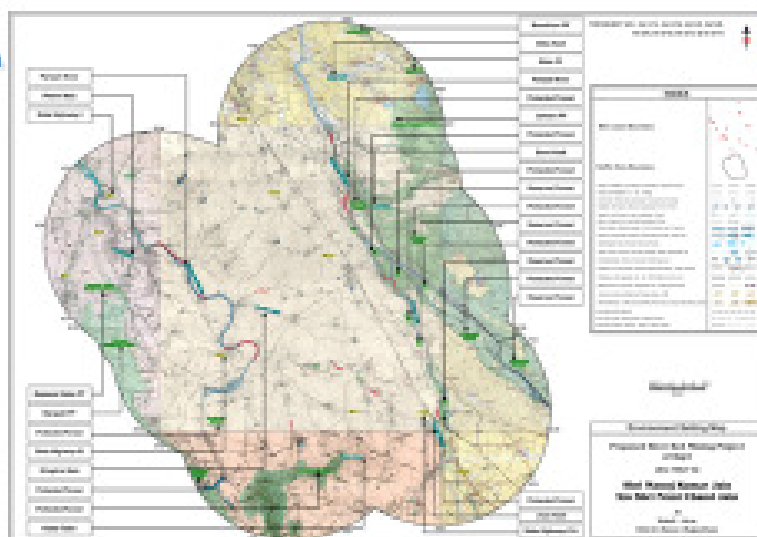
At Villages Kunjed, Mayta, Bichhals, Manyagan, Patna, Kawai Lolahedi, Atru, Piplod, Degni Jagir, Aaton, & Mothpur, Tehsil : Atru, District: Baran (Rajasthan)

Replenishment Study Report

Location map



Study area



River Bed Mining Project of Bajri, Area 159.27 ha with production capacity 0.538 million TPA

At Villages Kunjed, Mayta, Bichhals, Manyagan, Patna, Kawai Lolahedi, Atru, Piplod, Degni Jagir, Aaton, & Mothpur, Tehsil : Atru, District: Baran (Rajasthan)

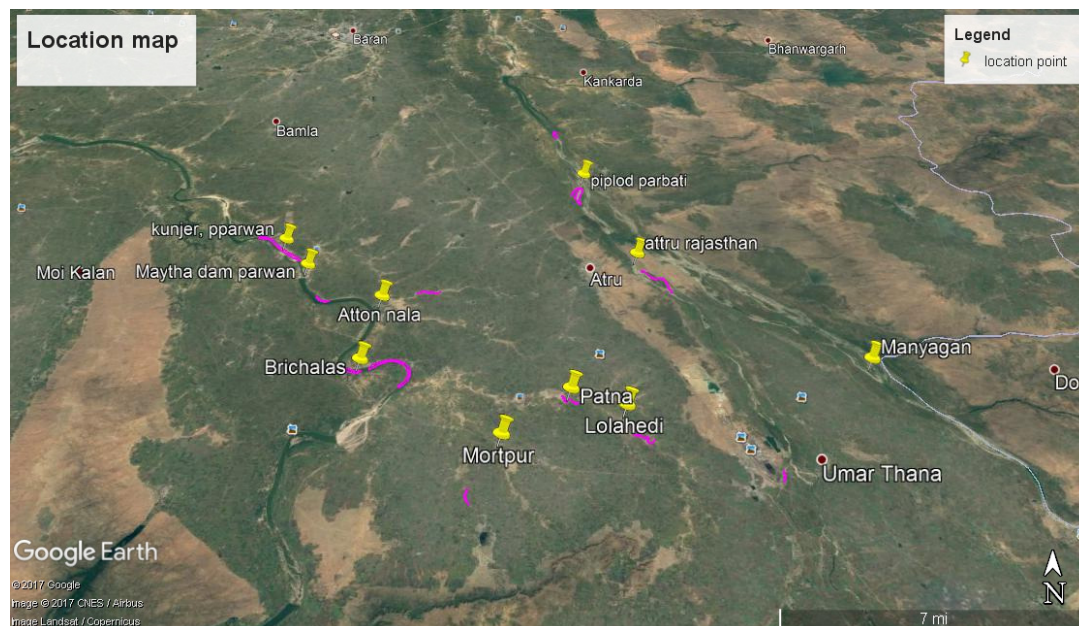
Replenishment Study Report

Fig. Map showing the location of sample points.

Fig. Google earth image showing the location of proposed blocks for mining**Geology, geomorphology, lithology:-**

The study area lies in Baran district of Rajasthan and is served by the subbasins of Chambal river, these subbasins include river Kalisindh, Parvati, Parwan & Kuno. The other small rivers are Andheri, Lhasi, Sukar, Ghadavat, Khadela, Kelwara, Bagardi, Kori etc. are the main source of mineral Bazri (Sand). The main rivers flow in the district area are a part of sedimentary rocks of Vindhyan Supergroup. The fragments of sedimentary rocks are the main source of forming the mineral sand (bazri). The mineral like sand as times elements flow to down stream and deposited at the sites of river where flow of water is slow or at the sites where river is turns.. The average rainfall in the district is 824.31 mm. Major part of Baran district is occupied by shale sandstone-limestone sequences belonging to Vindhyan Supergroup of middle to upper Proterozoic age and Deccan traps and laterite of Cretaceous to Eocene age. The oldest rock type of Vindhyan Supergroup belongs to Upper Rewa and is overlain by Bhandar group followed by Deccan traps and laterite.

River Bed Mining Project of Bajri, Area 159.27 ha with production capacity 0.538 million TPA

At Villages Kunjed, Mayta, Bichhals, Manyagan, Patna, Kawai Lolahedi, Atru, Piplod, Degni Jagir, Aaton, & Mothpur, Tehsil : Atru, District: Baran (Rajasthan)

Replenishment Study Report

Fig. map showing major rivers of Baran district

Table: Year wise excavation

year	ROM excavated in MT tonnage	Rec. of sand MT 95%	Waste generated in MT 5%
1 st year	316233	300421	15812
2 nd year	405028	384777	20251
3 rd year	473082	449428	23654
4 th year	488711	464275	24436
5 th year	538163	511255	26908
Total	2221217	2110156	111061

IMPACTS OF SAND MINING

Sand mining has an adverse and destructive impact, at the same time it has some positive impacts also. It observes that the removal of sand from the riverbeds in a sustainable way can improve the river health.

A. Negative Impacts

Taking into consideration the places of occurrences of the adverse environmental impacts of river sand mining, Kiteu and Rowan (1997) classified the impacts broadly into two categories namely Off- site impacts and On-site impacts. The off-site impacts are, primarily, transport related, whereas, the on-site impacts are generally channel related. The On- site impacts are classified into Excavation impacts and water supply impacts. The impacts associated with excavation are channel bed lowering, migration of excavated pits and undermining of structures, bank collapse, caving, bank erosion and valley widening and channel instability. The impacts on water supply are reduced ground water recharge to local aquifers, reduction in storage of water for people and livestock especially during drought periods, contamination of water by oil, gasoline and conflicts between miners and local communities.

B. Positive Impacts

Sand deposition eventually leads to reduction in conveyance capacity of river leading to flood in rivers. Proper dredging of sand keeps the bed at the desired level. Thus if dredging is not done, due to continuous deposition of sand, the depth of river may get reduced. This will result in flooding of water and loss of properties. Riverbeds are major sources of clean sand. It is observed that the demand of sand for house construction has been increased drastically which is reflected well in exponential rise in the number of terraced and tiled houses. Collecting sand from rivers and its distribution has become an industry giving job opportunities for thousands.

Sediment Transport

Sediment transport is the movement of organic and inorganic particles by water. In general, the greater the flow, the more sediment that will be conveyed. Water flow can be strong enough to suspend particles in the water column as they move downstream, or simply push them along the bottom of a waterway. Sediment transported in river as bedload, suspended load, and wash load.

Bedload

Bedload is the portion of sediment transport that rolls, slides or bounces along the bottom of a waterway . Bedload occurs when the force of the water flow is strong enough to overcome the weight and cohesion of the sediment 12. Approximately 5-20% of total sediment transport is bedload 10.

Suspended Load

The suspended load is the amount of sediment carried downstream within the water column by the water flow. Suspended loads require moving water, as the water flow creates small upward currents (turbulence) that keep the particles above the bed. Larger particles are more likely to fall through the upward currents to the bottom, unless the flow rate increases, increasing the turbulence at the streambed. In addition, suspended sediment will not necessarily remain suspended if the flow rate slows.

Wash Load

The wash load is a subset of the suspended load. This load is comprised of the finest suspended sediment (typically less than 0.00195 mm in diameter). The wash load is differentiated from the suspended load because it will not settle to the bottom of a waterway during a low or no flow period.

Sediment Deposition

Sediment is necessary to the development of aquatic ecosystems through nutrient replenishment and the creation of benthic habitat and spawning areas. These benefits occur due to sediment deposition – when suspended particles settle down to the bottom of a body of water. This settling often occurs when water flow slows down or stops, and heavy particles can no longer be supported by the bed turbulence. However, it should be noted that while sediment is important for aquatic habitat growth, it can cause environmental issues if the deposition rates are too high, or too low.

METHODOLOGY

The scientific solution for the crisis of sand mining needs an optimisation of sand removal. Knowledge of sand inflow at each section is the key part of determination of optimal sand removal.

To determine this sand inflow an analytical study is carried out by using bed load transport model. The bed load transport can be estimated using different analytical model such as Meyer-Peter's, Einstein's Model, Shield's Formula, Du-Boy's Formula etc. The present study deals with the Meyer-Peter's computation. For this, the sample of sand from different critical locations, flow data, and other river characteristics were used.

A. Meyer – Peter's equation

Meyer Peter's equation is based on experimental work carried out at Federal Institute of Technology, Zurich. Mayer Peter gave a dimensionless equation based, for the first time, on rational laws. It is given by

$$\frac{Q_s}{Q} \left(\frac{N'}{N} \right)^{\frac{3}{2}} wSD = 0.047(w_s - w)d + 0.25 \left(\frac{w}{g} \right)^{\frac{1}{3}} \left(\frac{w_s - w}{w_s} \right)^{\frac{2}{3}} (q_s)^{\frac{2}{3}}$$

Q_s = actual discharge in cumec,

Q = discharge in cumec if sides were frictionless

N' = Manning's coefficient for plane bed

N = actual value of Manning's coefficient for rippled bed

w = specific weight of water in kN/m³

S = bed slope of channel

D = depth of flow in m

w_s = specific weight of sediment particles in kN/m³

d = grain diameter in m

River Bed Mining Project of Bajri, Area 159.27 ha with production capacity 0.538 million TPA
At Villages Kunjed, Mayta, Bichhals, Manyagan, Patna, Kawai Lolahedi, Atru, Piplod, Degni Jagir, Aaton, & Mothpur, Tehsil : Atru, District: Baran (Rajasthan)
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g = acceleration due to gravity

qs = rate of bed load transport per unit width of the channels in kN/m³

The present study used the Meyer-Peterson's model for the estimation of bed load transport because of its wide acceptance and simplicity in computation. Other models give reliable estimates for manmade channels like canals. But the present study considered with river body, in which the former equation is relevant.

A sediment balance for the blocks prior to the start of dredging was determined. The river characteristics such as area of flow, velocity of flow, slope, discharge and sediment concentration are collected. The sediment load samples were collected from the upstream and the downstream of proposed mining block. The sediment load samples give the estimate of sediment getting deposited in the block and the sediment getting transported.

Estimation of sand deposited from blocks proposed for mining

Blocks have been selected on the basis of maximum deposition of sand. Sand inflow estimation has been done by taking discharge data, depth of flow at different point in each cross-section, slope, Manning's coefficient, and average size of the sand in each block. This river has a meandering course and velocity of flow is 0.1 to 0.6 m/s and results in settling of fine sediment which is suitable for construction. This in turn causes the development of good sand mining locations. As this river is seasonal only monsoon period (June-sept) is considered for study. During monsoon period the velocity of flow is observed high and is around 0.6 m/s. Thus assumption is made that 70% of sand transported is deposited during monsoon period. The rate of deposition is calculated based on this by assuming a width of 200 m from which sand removal takes place daily during the monsoon period. To maintain equilibrium of the river the amount of sand extracted should be less than the amount of sand deposited.

Estimation of sand deposition

Month	sediment inflow	Sand deposition	sediment load/day	sediment load/month	sediment load/month
	qs(kg/m/hr)	(kg/m/hr)	qs'=qs*24*width		(tonnes)
jun	1290	903	4334400	130032000	130032
jul	1305	913.5	4384800	135928800	135928.8
aug	1540	1078	5174400	160406400	160406.4
sep	1230	861	4132800	123984000	123984

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Annual sediment load					550351.2

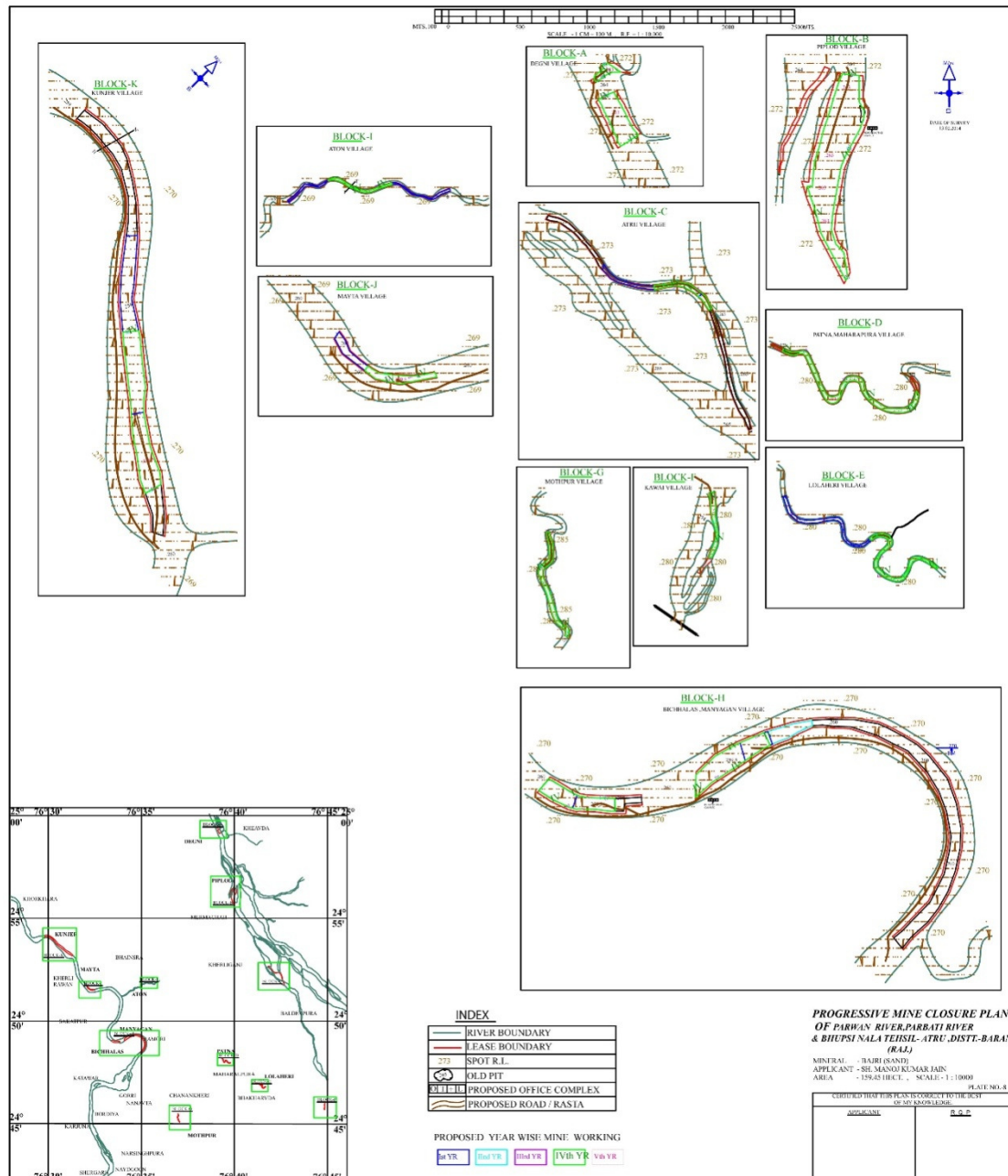


Fig. Map showing different cross-section of river.

River Bed Mining Project of Bajri, Area 159.27 ha with production capacity 0.538 million TPA

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Replenishment Study Report**Conclusion**

As the demand of sand is increasing it is recommended to remove sand from the blocks as per the proposed sediment load. The sediment deposition in that area is more than the proposed load for removal. The sediment load for the Parbati and Parwan river is higher than the proposed excavation of sand. So the removal of that amount of sand will not degrade the health of the river.