

Chapter-4

Illegal Mining

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As per Rule No. 4 of BMMC Rules, 1972, “No person shall undertake any mining operation in any area without valid permit.” Further, as per Rule 28 (1) of BMMC Rules, 1972, an application for quarrying permit shall be submitted to the competent authority in form-I. Further, whoever is found to be extracting or removing minor minerals without valid permit shall be presumed to be the illegal remover of the minor minerals and every such person shall be punished.

As per Rule 11 (I) of BM (CPTS) Rules, 2019, no person shall undertake any mining operation in any area, except under and in accordance with the terms and conditions of a quarrying permit or, as the case may be, a mining lease, granted under these rules; provided that nothing in this sub-rule shall affect any mining or quarrying operations, undertaken in any area, in accordance with the terms and conditions of a mining lease or quarrying permit, granted before the commencement of these rules, which is in force at the time of such commencement. No quarrying permit or mining lease shall be granted otherwise than in accordance with the provisions of these rules. The Mining Plan approved by the MGD serves as the area demarcated for carrying out any mining activity. The deficiencies in the Mining Plans has already been highlighted in **Chapter-2** and impact of the same has been discussed in that chapter. Further, the MGD implemented e-challans as quarrying permits under the extant rules and to act as system for prevention of illegal mining in the state. However, various deficiencies, observed in usage of e-challans have been highlighted in this chapter.

Audit Findings

4.1 Comparison of actual and approved mining *ghats*

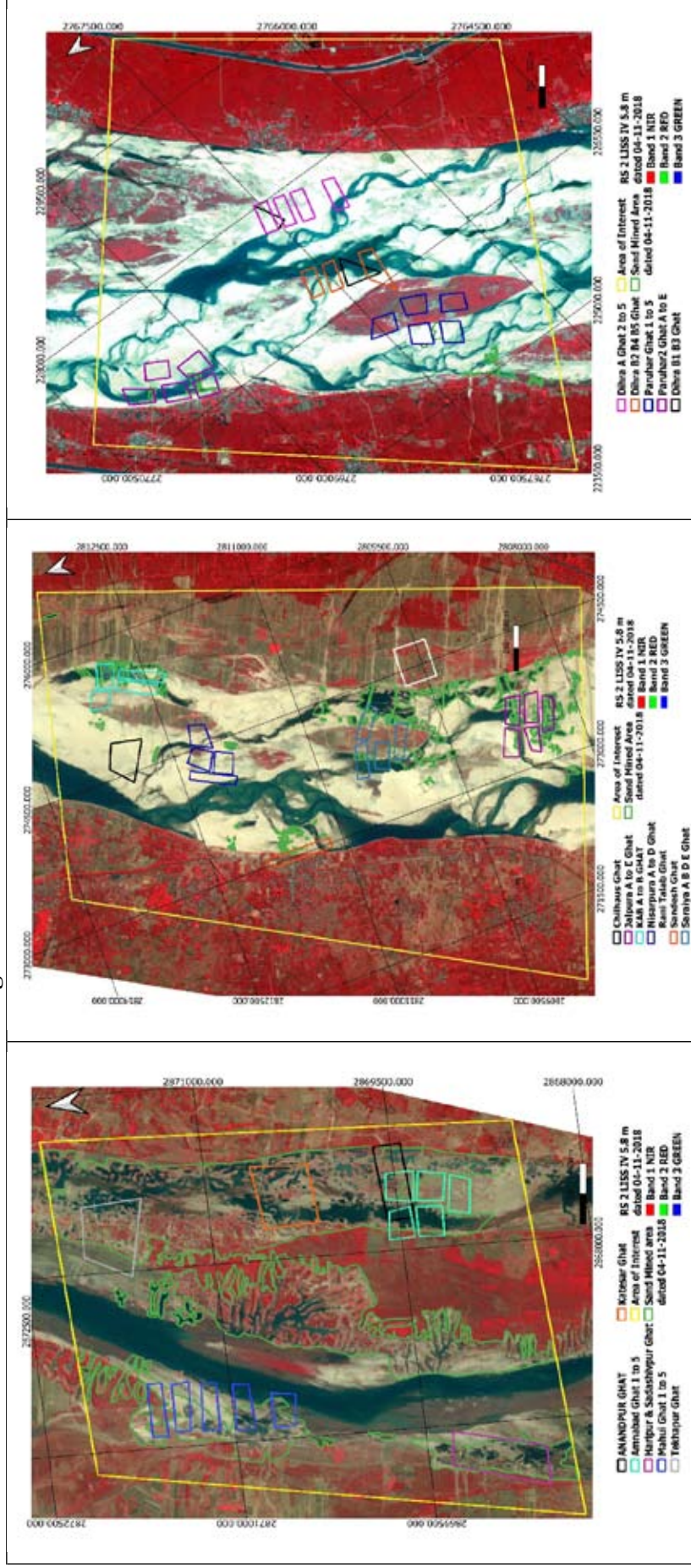
As defined in the methodology, three Areas of interest covering 17 sand *ghats*, were developed for GIS study. For the above study, LISS-IV images were used to analyse the actual mining area in the areas of interest. The said study was carried out for the period of two years where data for six different months were taken for the study.

The expert agency used ENVI and QGIS software for the analysis of GIS images. Supervised classification was carried out by NIT, Patna to differentiate between different land-use classes. For identification of mining locations, computer based classification was not found suitable by the expert agency and instead manual method/ visual interpretation technique was considered. This was based on the proof available in the processed satellite images, which would show road access, human intervention and man-made shapes with water logging *etc.* The image elements like tone, texture, shape, size, pattern and association *etc.* were also considered by the expert agency for the identification process.

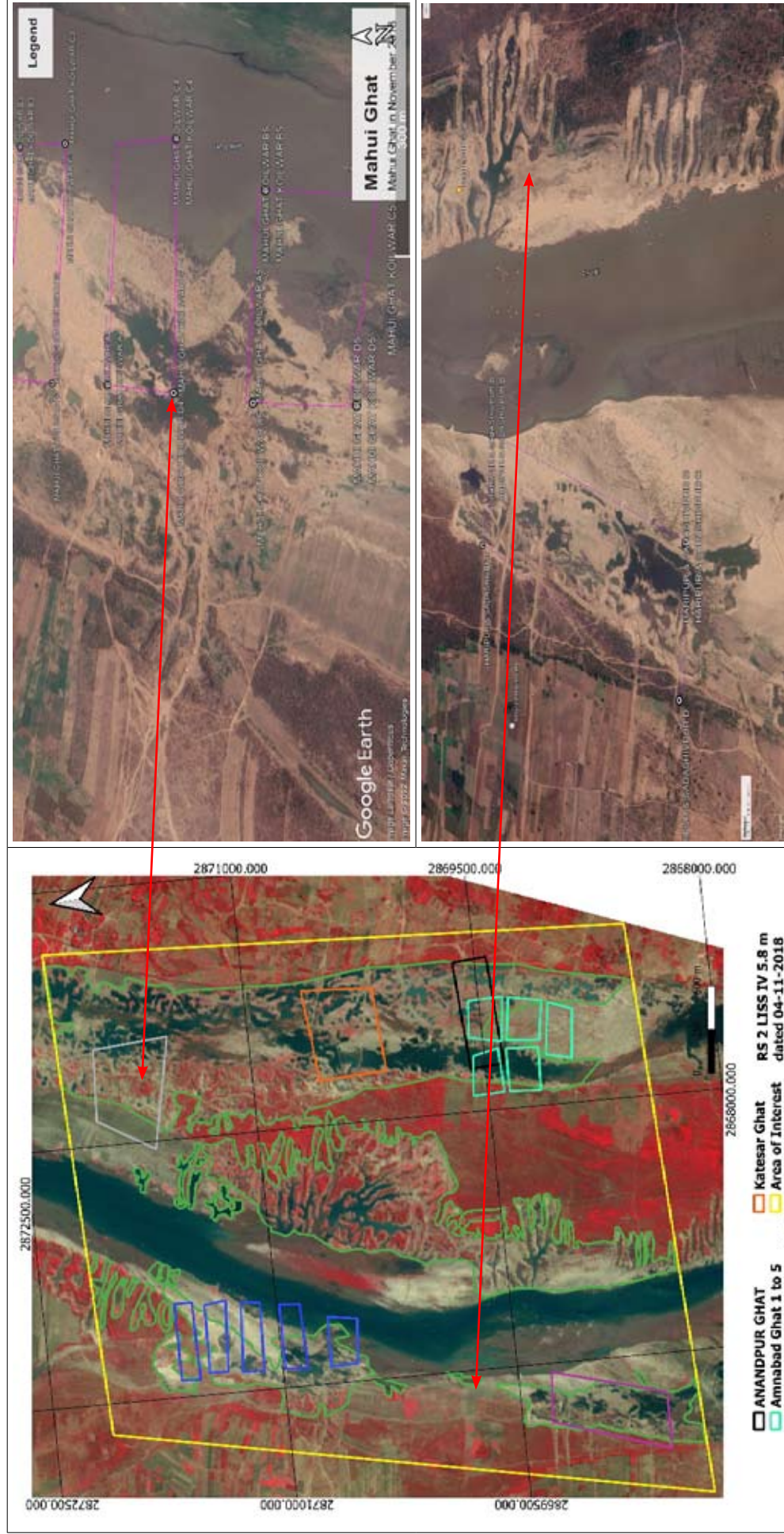
As per report of the expert agency, generally river sand appears in the tones of bright white to dull white (yellow) with medium to fine texture due to the presence of Silica minerals. Also, the sand mined areas could easily be identifiable with their irregular shapes, uneven tone and rugged surface. The report of expert agency

highlights that the sand excavation pits appear in dark to grey tone, coarse texture with uneven topography depending on the depth and moisture content in the area. Supplementary images were verified with the aid of Google Earth historical imagery tool to cross-check the sand mine areas by the expert agency. The GIS images of November 2018 for the three different areas of interest is highlighted in the **Table-7** below;

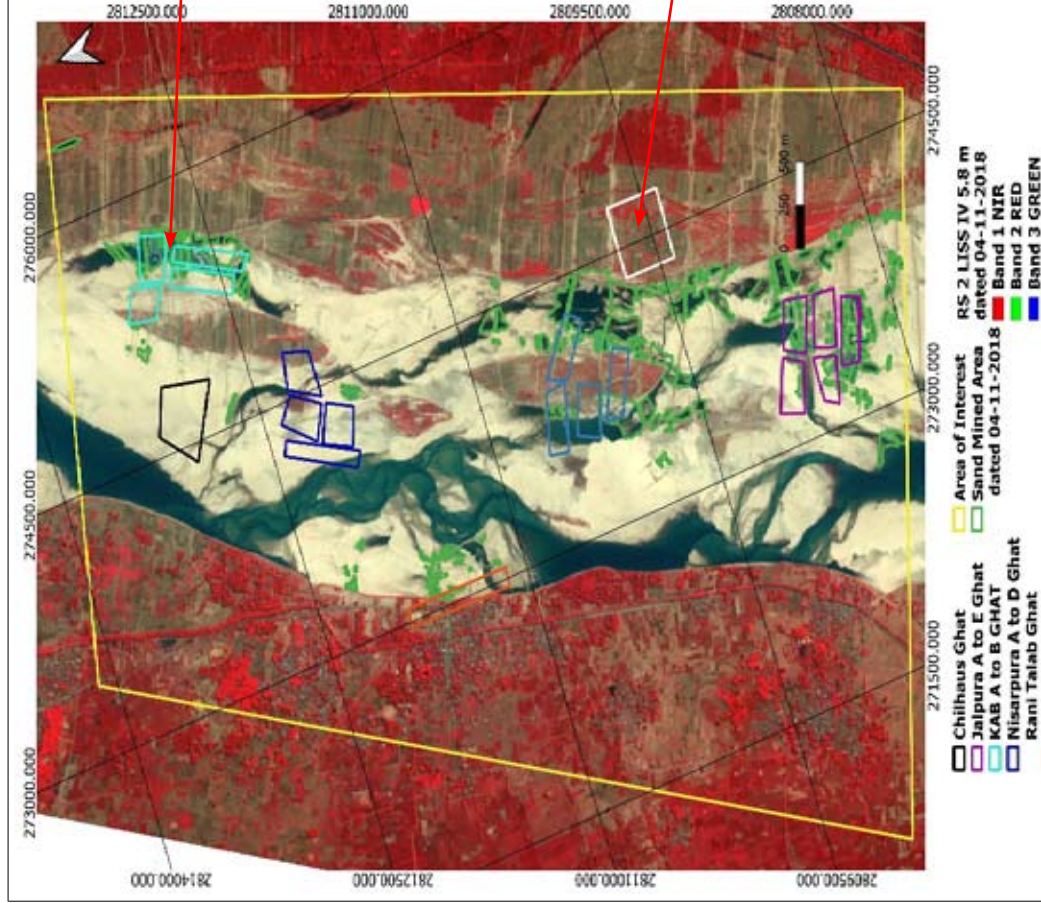
Table-7
Image of Actual mined area in all three AOI



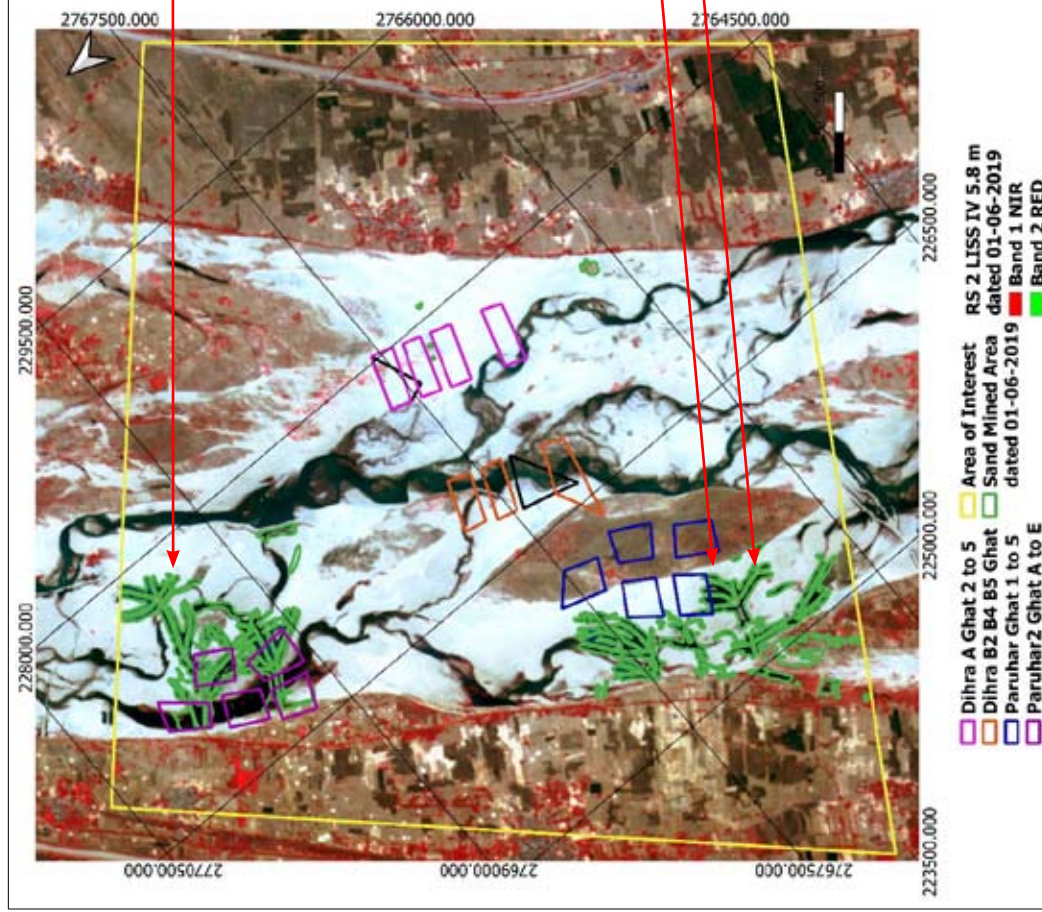
The above images (November 2018) highlight the actual mining area (in green boundary) in different AOI as well the approved mining areas in the Areas of Interest as per Mining Plan approved by MGD.



Google Earth images of November 2018 for two ghats in Area of Interest-I showing mined areas as well as movement of vehicles.



Google Earth images of November 2018 for two *ghats* in Area of Interest-II showing mined areas.



Google Earth images of May 2019 for two ghats in Area of Interest-III (image June 2019) showing similar shape of mined areas.

The above images highlight the mining being carried out outside of the approved mined areas. The trend continued in both the years for the selected months for all the areas of interest as shown in **Appendix-8**. The images show that the actual mining is being carried out outside all the sand *ghats* covering in the areas of interest as highlighted in the green colour boundary. The same was corroborated by Audit by checking the Google Earth images of the area in similar time frame as shown in pictures above. Further, as highlighted in **Chapter-2** relating to systemic deficiencies in approval of these Mining Plans, the coordinates have been approved without field verifications, which is also highlighted by the images of mining being carried out outside of such areas. The expert agency has also highlighted the inconsistencies in coordinates of the Mining Plan. Further, following can be observed from the images:

- Rani Talab *ghat*: The Mining Plan coordinates are coming in vegetation area while images show the mining being carried completely outside the area approved for Mining Plan.
- The Paruhar *ghat* has been approved amidst the river channel as shown in images above and mining can be seen completely outside the approved area near to the river bank.

Further, Audit also analysed the available Google Earth images of 86 sand *ghats* in three districts selected for GIS study on a sample basis. In order to identify mining activity outside of approved sand mining area, time series imageries for the years 2014, 2015 and 2018 of Google Earth Pro were used. The interpretation was done to capture the movement of trucks/trolleys in the river bed zone of approved sand mining areas allotted for a particular sand *ghat* on Sone river for sand extraction as per Geo-coordinates in Mining Plan and EC. After plotting Geo-coordinates of sand *ghats* of above three districts on Google Earth Pro, it was noticed that mining activities were being carried out in the area outside allotted area as seen in satellite images below:

(a) Patna

As per available historic satellite images of sand *ghats* of Sone river in Patna district on Google Earth Pro, the outside extractions were seen in 20 out of 24 sand *ghats*. Images of some of the *ghats* have been highlighted in **Figures 43 to 47**:



Figure 43: Outside extraction shown in March 2020 at Udaipur sand *ghat*.



Figure 44: Outside extraction shown in February 2020 at Annabid sand *ghat*.



Figure 45: Outside extraction as well as movement of vehicles shown in March 2020 at Janpara sand ghat.



Figure 46: Outside extraction shown in March 2020 at Jalpura sand ghat.

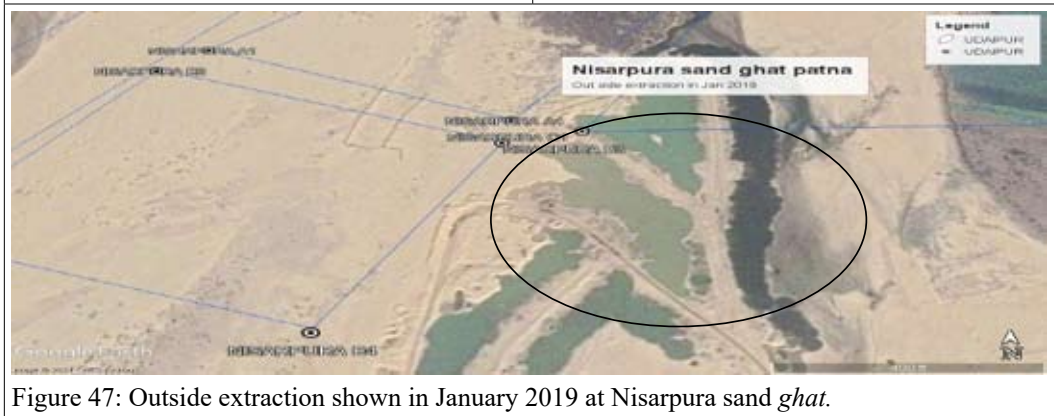


Figure 47: Outside extraction shown in January 2019 at Nisarpura sand ghat.

(b) Bhojpur

As per available historic satellite images of sand ghats of Sone river in Bhojpur district on Google Earth Pro, the outside extractions were seen in 28 out of 36 Sone sand ghats. Images of some of the ghats have been highlighted in Figures 48 to 55:



Figure 48: Outside extraction shown in February 2020 at Mahui sand ghat.



Figure 49: Outside extraction shown in April 2018 at Kharonkalan sand ghat.



Figure 50: Outside extraction shown in February 2019 at Koilwar Chhitampur sand *ghat*.



Figure 51: Outside extraction shown in January 2019 at Karbasin sand *ghat*.



Figure 52: Outside extraction shown in March 2020 at Sarimpur Bachri sand *ghat*.



Figure 53: Outside extraction shown in March 2020 at Kirkiri sand *ghat*.



Figure 54: Outside extraction shown in March 2020 at Baruhi sand *ghat*.



Figure 55: Outside extraction shown in March 2020 at Narayanpur sand *ghat*.

(c) Rohtas

As per available historic satellite images of sand *ghats* of Sone river in Rohtas district on Google Earth Pro, the outside extractions were seen in 16 out of 26 Sone sand *ghats*. Images of some of the *ghats* have been highlighted in **Figures 56 to 61**:



Figure 56: Outside extraction shown in November 2018 at Paruhar sand ghat.



Figure 57: Outside extraction shown in May 2019 at Paruhar 2 sand ghat.



Figure 58: Outside extraction shown in June 2018 at Chaknaha sand ghat.



Figure 59: Outside extraction shown in May 2019 at Majhiao sand ghat.



Figure 60: Outside extraction shown in May 2019 at Darihat 1 & 2 sand ghat.



Figure 61: Outside extraction shown in May 2019 at Darihat 3 sand ghat.

Apart from above, sand mining activities were observed outside, approved lease areas in 17 sand ghats¹ of Chandan river in Banka district (as detailed in **Appendix-9**).

Thus, from the GIS study as well as Google Earth satellite images the persistent prevalence of the mined areas outside the approved areas had been noticed in

¹ Baisa, Bisunpur, Domuhan, Godiya, Govindpur, Jitapur, Jogi Pahari, Kunani, Lakhnauri-1, Lakhnauri-2, Manjhira, Majhiyara Arazi, Majhoni, Patwe & Bhorwa, Patwe Bhorwa & Majhiyara Arazi, Rajipur Kakna and Saran Godiya.

all the three test checked districts *ghats* throughout the audit period. Owing to systemic deficiencies in the approval of these coordinates as well without proper demarcations, the illegal mining can be seen as rampant feature throughout the test checked districts. Most of the control mechanisms required to be employed by the Department as per SSMMG to check illegal mining were found non-existent as highlighted in this paragraph, which has further impacted the expanse of illegal mining.

The matter was reported to the Department (April 2022); their reply was awaited (23 May 2022).

4.2 Actual mining area in the sampled *ghats*

The LISS-IV images procured from NRSC, Hyderabad were used for finding the mining areas by the expert agency. The sand mining area was digitised within the boundary of AOI-I, II and III. The approximate surface area of sand mining for 17 approved *ghats* was calculated for the time periods November 2018, February 2019, June 2019, November 2019, January 2020 and March 2020. The actual area mined inside the approved boundary for the selected *ghats* and selected time periods is detailed in **Appendix-10**.

The total surface area mined in all AOI have been calculated and presented in **Charts-6 to 8**. The area of mining outside the approved boundary and inside the AOI boundary is considered as illegal sand mining area. It is important to note that all the calculations have been carried out with the same area for all AOI. All the area calculations presented here are purely based on the analysis of satellite images (LISS-IV) provided by the expert agency *i.e.* NIT, Patna has also highlighted in their report that there may be differences in computation of the area owing to supervised learning, hence areas calculated has been marked as approximate area in the **Appendix-11**. Further, the illegal sand mined areas, actual area mined within the approved *ghats* and the total surface area mining in the AOI-I, II and III are plotted in **Appendix-8**.

Chart-6

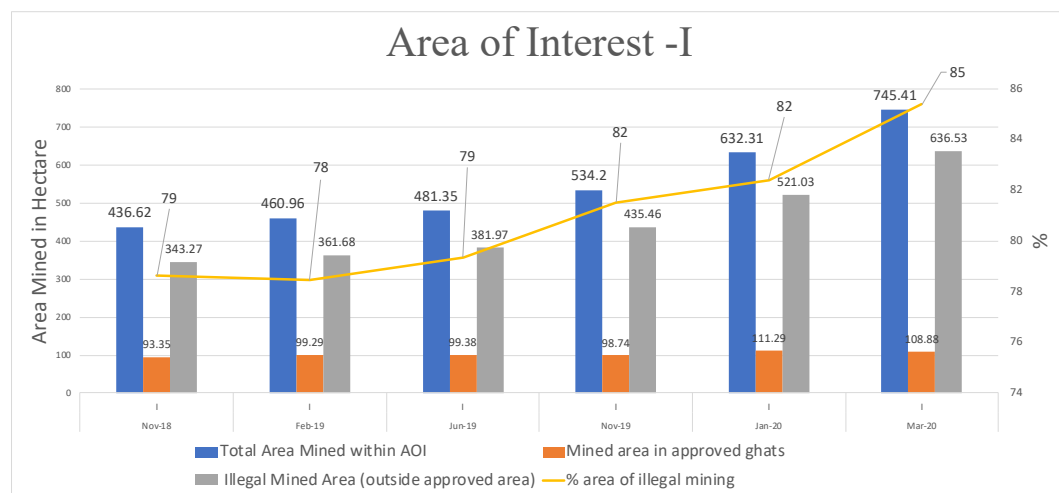


Chart-7

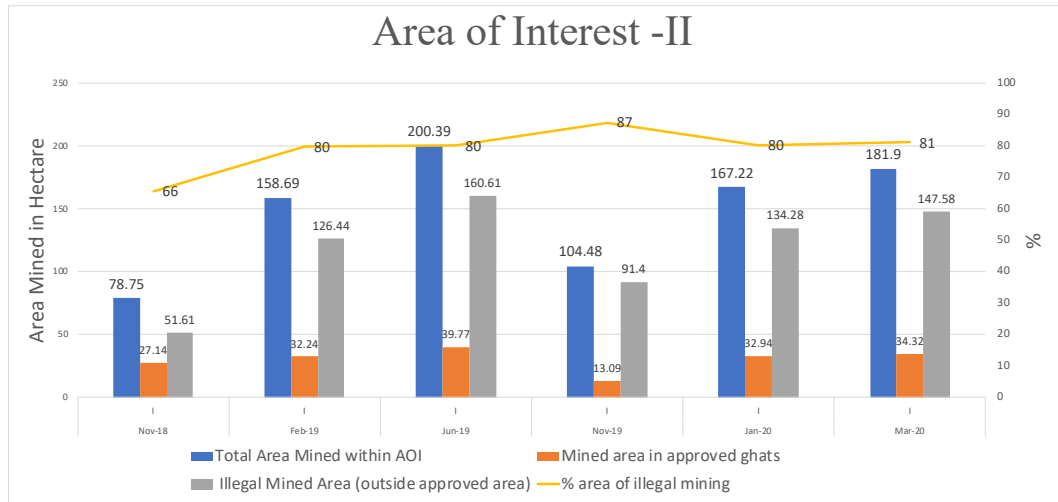
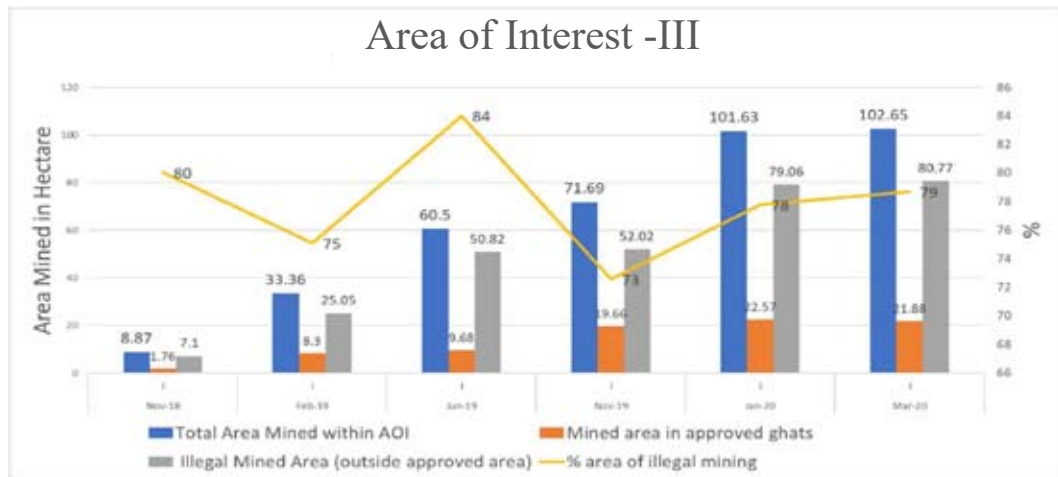


Chart-8

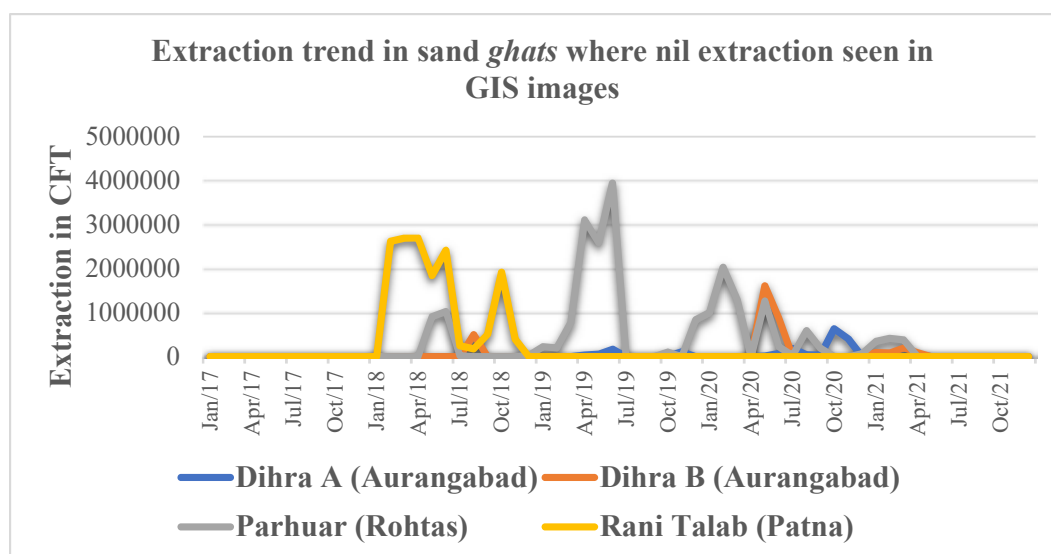


It is interesting to note that the area of overall mining increased from November 2018 to June 2019 and this cycle repeated for November 2019 to March 2020 for all AOI. Overall results show that the surface area mining increased from November 2018 to March 2020. It was also observed that the rate of increase was more in AOI-I, as compared to AOI-II and III. Expert agency in its report also stated that this may be due to the proximity of sand *ghats* in AOI-I to the State capital Patna. Further, looking at illegal mining data, the average illegal mining areas for AOI-I, II and III are 81 per cent, 79 per cent and 78 per cent respectively. This highlights that most of the illegal mining was being carried out outside the approved area. Thus, it is evident from the above results using satellite images that in all the selected AOI, considerable illegal mining was being carried out during the periods mentioned. It was noticed that with the AOI size, the illegal mining was increasing with the years.

The above charts highlight the area mined inside the approved area in the *ghats* covered in three different AOI. Two sand *ghats* (Amnabad and Anandpur) in AOI-I have been intentionally left out of the analysis as the coordinates of the two *ghats* are overlapping and actual area mined inside each *ghat* could not be calculated. From the above data, following was observed by the Audit:

- In AOI-I, mostly all the *ghats* were shown mined almost 80 per cent to 90 per cent in the specified period and when correlated with total mining inside AOI-I, it could be observed from the chart that illegal mining outside the approved area had been persistently increasing.
- Further, four *ghats*² are seen to have no mining activity in the approved area in any of the specified period. However, on verification of the despatch data of these *ghats* by Audit, it was found (2018-2021) that 16.97 lakh tonne of sand were shown despatched from these *ghats*. **Chart-10** below shows the trend of despatch reported by the lessee from these *ghats* from January 2017 to October 2021. It can be observed from the chart below that majority of despatches have been shown between 2018 and 2020. This also highlights that mining was carried out outside the approved area. Only one sand *ghat* Dhira A (Aurangabad) has reported nil despatch (January 2017 to March 2019) which can also be correlated from GIS images.

Chart-10



Further, Audit analysed the penal provisions for excess extractions by the lessee themselves and found that as per condition 3 (vii) of Bihar Sand Mining Policy, 2013, the lessee had to pay only extra royalty in case the quantity of sand extracted in a particular year is in excess to that of prescribed quantity of the settlement amount of that year, whereas, the penalty for transportation of illegal mined minerals was found to be 25 times royalty and fines amounting to ₹ 25,000 to ₹ 4,00,000, along with imprisonment clause. However, for illegal mining (beyond the approved Mining Plan area) by lessees, there was no penal clause in the Sand Policy. Audit also analysed penal provisions of the Sand Policy of Madhya Pradesh and found that penalty for excess/illegal extractions by lessee was cost of mineral, which

² Dhira A, Dhira B, Paruhar and Rani Talab.

is much higher than the royalty amount. Therefore, Audit is of the opinion that absence of suitable penalty clause for illegal mining by the lessees is an important factor contributing towards illegal mining as observed from the increasing trends of illegal mining from GIS study.

The matter was reported to the Department (April 2022); their reply was awaited (23 May 2022).

Recommendation: The Department should carry out Geo-spatial study of the sand *ghats* from time to time, to ensure that mining is being carrying out as per the approved plans and any deviation from the same could be reported and suitable action may be taken against illegal miners.

4.3 Other findings through Analysis of Google Earth Pro images

4.3.1 Mining activities carried out without obtaining EC

As per order of Hon'ble NGT, Eastern Zone Bench, Kolkata (19 January 2016), mining activities were to be stopped in Bihar due to non-obtaining of EC by the sand lease holders with immediate effects.

Audit observed in analysis of available satellite images on Google Earth Pro that in Sone sand *ghats* in three districts, the mining activities were seen to be carried out in 12 sand *ghats*³ without obtaining Environmental Clearance despite orders of NGT. The images of mining activities without EC are shown in **Figures 62 to 77**:

Bhojpur

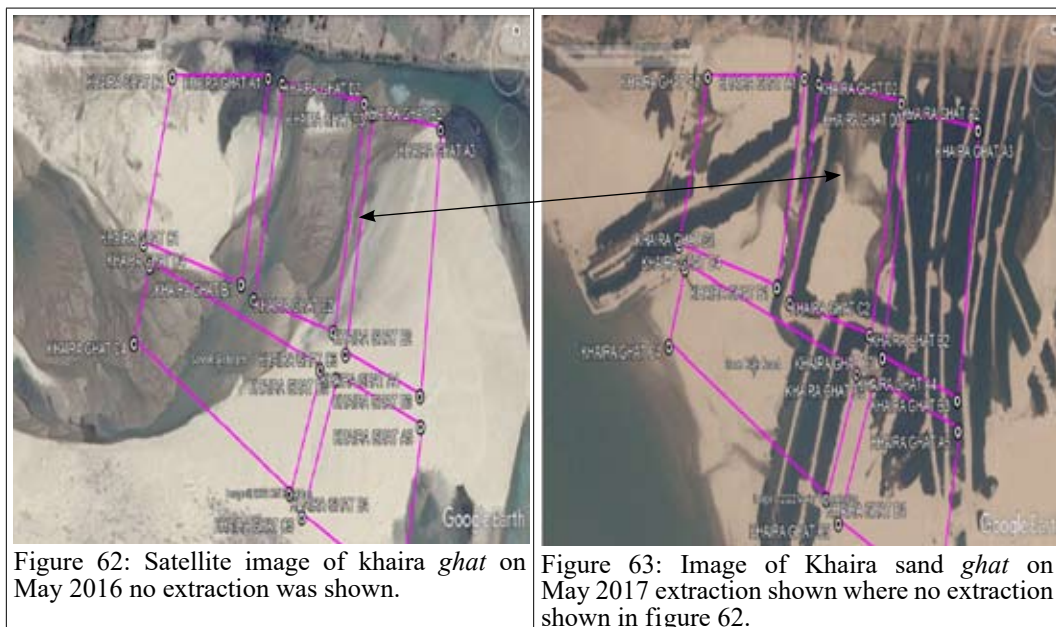


Figure 62: Satellite image of khaira *ghat* on May 2016 no extraction was shown.

Figure 63: Image of Khaira sand *ghat* on May 2017 extraction shown where no extraction shown in figure 62.

³ **Bhojpur**- Abgila, Farhangpur-1, Khaira, Khangaon-1 and Sahar and Peurchak sand *ghat*; **Patna**- Jalpura, Kateshar, Kauriya and Saraiya sand *ghat*; **Rohtas**- Danwar, Hurka and Kerpa sand *ghat*.



Figure 64: Satellite image of Khangaon-1 sand ghat on November 2016 no extraction was shown.



Figure 65: Image of Khangaon-1 sand ghat on January 2017 extraction shown where no extraction shown in figure 64.



Figure 66: Satellite image of Abgila sand ghat on May 2016 no extraction was shown.



Figure 67: Image of Abgila sand ghat on May 2017 extraction shown where no extraction shown in figure 66.



Figure 68: Satellite image of Farahangpur sand ghat on May 2016 where extraction of sand carried out as shown in circle.



Figure 69: Satellite image of Farahangpur sand ghat on March 2017 where extraction of sand carried out as shown in circle.



Figure 70: Satellite image of Sahar & Peurchak sand *ghat* on May 2016 where extraction of sand minerals were seen in circle.

Patna



Figure 71: Satellite image of Kateshar sand *ghat* on May 2016 where sand extraction can be seen in circle.



Figure 72: Satellite image of Kauriya sand *ghat* on January 2017 sand extraction seen in circle.



Figure 73: Satellite image of Jalpura sand *ghat* on October 2016 where sand extraction can be seen in circle.

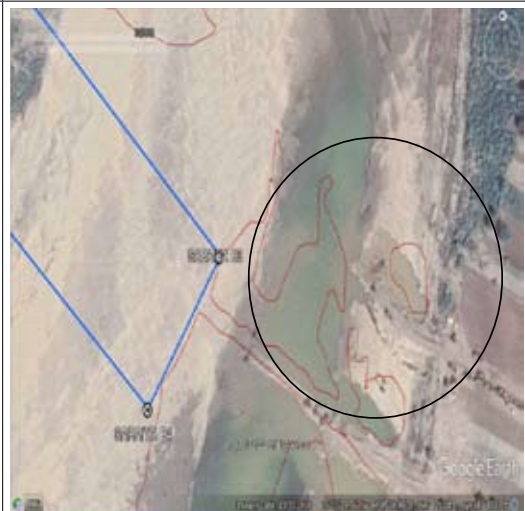


Figure 74: Satellite image of Saraiya sand *ghat* on October 2016 where sand extraction can be seen in circle.

Rohtas



Figure 75: Extraction shown in circle mentioned in image of Danwar sand *ghat* of May 2016.



Figure 76: Extraction shown in circle mentioned in image of Hurka sand *ghat* of May 2017.



Figure 77: Extraction shown in circle mentioned in image of Kerpa sand *ghat* May 2016.

Further, EC of Kateshar *ghat* was obtained in December 2016, EC of Sahar & Peurchak, Khaira, Kauriya, Saraiya, Jalpura, Khangaon-1, Farhangpur-1 and Abgila sand *ghat* was obtained in February 2018 and EC of Hurka, Kerpa and Danwar sand *ghats* was obtained in March 2018.

Therefore, it can be observed that MGD failed to enforce the orders of Hon'ble NGT for stopping the mining activity without EC.

The matter was reported to the Department (April 2022); their reply was awaited (23 May 2022).

4.3.2 Mining activities seen in satellite images where nil extraction report was submitted by lessees of sand mining lease

Audit observed from scrutiny of leases of sand *ghats*, in respect of three districts Patna, Bhojpur and Rohtas that lessees had reported nil extraction in two sand *ghats* Janpara-I and Anandpur of Patna district in 2018 and 2019 respectively and in one sand *ghat* Chillhous of Bhojpur district in 2020 (Detailed in **Appendix-12**).

Audit when analysed the satellite images of these sand *ghats* during these periods, noticed that the mining operations were seen to be carried out in the imageries of 2018, 2019 and 2020 in these three sand *ghats* of two districts, as illustrated in **Figures 78 to 80**:



Figure 78: Extraction shown in circle of image of Anandpur sand *ghat* in June 2019.

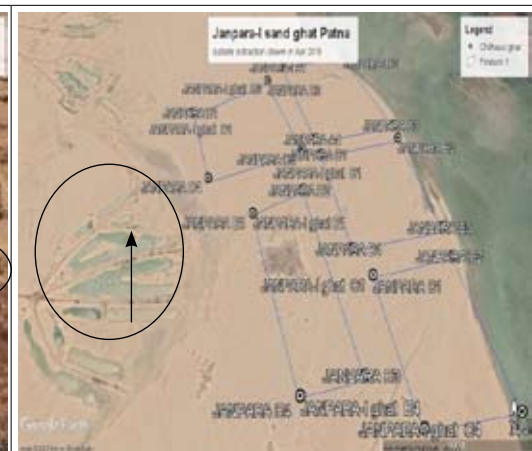


Figure 79: Extraction shown in circle of image of Janpara-1 sand *ghat* in April 2018.



Figure 80: Extraction shown in image of Chillhaus sand *ghat* in March 2020.

4.3.3 Excess extraction against despatches reported by lessees of sand *ghats*

In order to identify the actual extraction by the lessees of sand *ghats*, Audit analysed the areas of six approved sand *ghats*⁴ through Google Earth Pro. These sand *ghats* were selected on sample basis where consecutive images of *ghats* were available in time series imageries for the years 2018, 2019 and 2020 in Google Earth Pro. Google Earth Pro was used as application for calculating the mined area. The interpretation was done on the basis of two consecutive images of different period, one where extraction is not seen in satellite images and other where extraction is seen in images taken after short period. Further, as highlighted earlier that most of the mining was being carried out outside of the approved area, here also, on a conservative basis, the area actually mined nearby to the approved area (including the area inside the approved area) was taken for calculation purpose. The changes of earth after extraction are shown in **Figures 81 and 82**:

⁴ Amirabad Gona, Chaknaha, Darihat-3, Lahladpur, Nisarpura and Katar.



Figure 81: Images captured for Lahladpur sand ghat for the period April 2018.



Figure 82: Images captured for Lahladpur sand ghat for the period February 2018.

Further, Audit plotted the mined areas in the form of different polygons in Google Earth Pro, to find the actual mined area between two consecutive periods. Areas of all the plotted polygons adjoining approved areas were considered for the calculation purpose. Bihar Sand Mining Policy, 2013, provides that mining is allowed up to depth of three metres or water level, whichever is encountered first. The same was reiterated in SSMMG, 2016. In this regard, Audit observed that no mechanism was developed by the Department to ascertain the ground water data and no such report was prepared by the Department. Audit, while examining the approved Mining Plan of these areas, observed that the depth of sand in these areas was stated to be at least three metres above water level. Therefore, the volume of extracted sand in consecutive periods was calculated by multiplying the area with three metres of assumed depth. The process of finding out mined area is highlighted in **Figures 83 to 86** on sample basis (as details in **Appendix-13**).

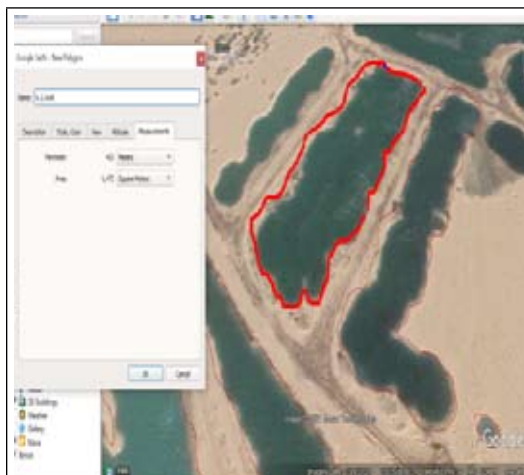


Figure 83: Plotted mined area Amirabad gona image of March 2020.

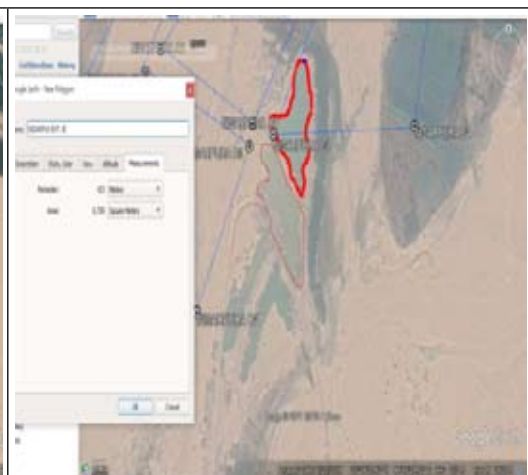


Figure 84: Plotted mined area Nisarpura sand ghat image of January 2019.



Figure 85: Plotted mined area in red boundary in Katar sand *ghat* extraction measured in January 2019.



Figure 86: Plotted mined area in red boundary in Darihat-3 sand *ghat* extraction measured in January 2019.

After the calculation of approximate extracted material observed from the satellite images, audit further compared the despatches of sand as reported by the lessees through database of e-challan. The results are reported in **Table-8**:

Table-8

Name of sand <i>ghat</i>	Period of satellite images which was analysed	Total area found extracted after plotting polygon (square metre)	Total quantity extracted after taken depth three metres as per Mining Plan (cubic feet)	Quantity reported by lessee as per mining database (cubic feet)	Difference (cubic feet)	Remarks
Amirabad gona	May 2019 -March 2020	1,33,578.00	1,41,51,759	1,09,41,350	32,10,409	No extraction was noticed in May 2019
Nisarpura	January 2019	29,921.00	31,69,953	4,48,250	27,21,703	Nil extraction was reported in whole of 2018.
Lahladpur	February 2018-April 2018	30,558.00	32,37,482	23,19,200	9,18,282	No extraction was observed in the area in February 2018.
Chaknaha	November 2018-January 2019	1,87,146.50	1,98,26,962	12,51,518	1,85,75,444	--
Katar	June 2018-January 2019	3,14,580.00	3,33,27,895	1,69,05,000	1,64,22,895	No extraction was seen in the image in June 2018.
Darihat 3	March 2018-June 2018	65,037.40	68,90,329	12,20,700	56,69,629	No extraction was observed in the image in March 2018.
Total		7,60,820.90	8,06,04,380	3,30,86,018	4,75,18,362	

It can be observed from the table above that in above six sand *ghats*, on a conservative basis, approximately 4,75,18,362 cubic feet (59 per cent) was reported less by the lessees vis-à-vis the approximated extractions in these *ghats* as observed through Google Earth images.

The matter was reported to the Department (April 2022); their reply was awaited (23 May 2022).

4.4 Measures to monitor the extraction of minerals

As per the Environment Impact Assessment (EIA) Notification 2016, the State Mining Department should print the Transport Permit or Receipt with security features like Unique Bar code, QR code, Fugitive ink, Invisible ink, Water mark *etc.* and issue them to mine lease holder through the District Collector.

- Once these Transport Permits or Receipts are issued, they should be uploaded on the server against that mine lease area.
- Each receipt should preferably be with pre-fixed quantity, so that 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. Therefore, all the details of transporting of mined out material can be captured on the server and the Transport Permit or Receipt cannot be reused.
- The route of vehicle from source to destination can be tracked through the system using check points, Radio Frequency Identification (RFID) Tags, and Global Positioning System (GPS) Tracking.
- This system would enable the authorities to develop periodic reports 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 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 not later than three months.

Audit observed that the MGD, had implemented an integrated IT solution (October 2017) for increasing their revenue and curbing illegal mining effectively. In this regard, the MGD further considered the Request for Proposal (RFP) prepared by Price Waterhouse Coopers (PWC) under Grow Bihar Project Scheme funded by erstwhile Department for International Development (DFID). After getting through the RFP, the Department assessed that it would take 27 months to complete the software and its costing would be ₹ 2.50 to ₹ 3.00 crore.

Due to time and cost constraints, the MGD procured source code of software from the Odisha Government (made by M/s i3MS) which was running in Odisha State successfully. According to the Department, the procured software should have fulfilled the desired objective of the Mines and Geology Department and the Department claimed that this was helpful in curbing the illegal mining in the State of Bihar. Further, the Department hired an agency M/s CSM Technology Private Limited for customisation of procured software as per need and further running of customised software on nomination basis. An agreement was signed

(February 2018) between the Mines and Geology Department, GoB and M/s CSM Technology Private Limited for functioning as Project Monitoring Unit.

As per agreement, 20 modules⁵ of the software were to be customised to make it functional for the Department. In addition to this, other changes, whenever required by the Department, were also to be made and to be functional. The main work of Project Management Unit (PMU) at Department level (October 2017) was to monitor the functional status of all the planned modules in the IT system.

In this regard, Audit observed that, out of 20 planned modules, only five modules⁶ were functioning. With respect to the EIA notification, only facility to generate e-challans and block them manually was made functional. The security features of e-challans as enumerated in the EIA notification, were not present as a large number of e-challans were found to be fake during audit (detailed in the paragraph below). Further, it was observed that the IT system was being used only for generating e-challans without controls as other modules were non-functional, the impact of which is highlighted in paragraphs below. Audit also observed that:

- When requisitioned by Audit, the basic documents for the functioning of IT systems like User Requirement Specification (URS), Software Design Document (SDD) *etc.* were not available with the Department. In absence of SDD, the Department was fully dependent on the private software developers to handle the critical project.
- Further, major modules like Mineral Carrying Vehicle Registration (for identification of vehicles), RTO integration (for verification of vehicles) and Geo-fencing Module (for tracking the real-time and historical movement of vehicles) were not made functional which were also envisaged in original RFP.
- The important feature like tracking of vehicular movement, interception reports of illegal mining required for monitoring the movement of the minerals was absent in the present system.
- MMDR Act and BM (CPTS) Rules, 2019 also provide that check posts and weigh bridges were to be set up to ensure effective vigil on illegal mining and transportation of minerals. But, as per records of DMOs, this equipment was not installed at mining sites. It was further observed that only four check posts were notified in three districts⁷ out of 14 sampled districts. No check posts were installed or notified in the remaining 11 districts. Thus, Department's capability to curtail illegal mining was limited.
- The responsibility of generating e-challans was assigned to lessees without validation controls like automatic capture of weight of mineral despatched, type of vehicles, *etc.*

⁵ System study and Gap analysis, Mines and Dealer Profile, e-permit, (BULK QTY DISPATCH), e-transit pass, Mobile apps (e-enforcement), Mineral carrying vehicle registration, Online Payment Registration, Grant of Short term Permits, New/Renewal of Licences for supplier & crushers, Weigh Bridge Registration, Mineral Concession (pre & post activity of e-auction), SMS and e-mail integration, Monthly Progress Return, Demand assessment, Grievance Monitoring, Case Management, Dues Clearance Certificate, RTO integration, MIS report and Vehicle seizure.

⁶ Mines and Dealer Profile, e-transit Pass, New/Renewal of Licences for supplier & crushers, Weigh Bridge Registration and MIS report.

⁷ Bhagalpur, Kaimur and Nawada.

In absence of major modules, when Audit analysed the database of e-challans, it was observed that there were several cases of mineral being carried by unrealistic vehicles, irregular generation of e-challans as high number of trips in single day, lower reporting of extractions, excess mineral being carried out by the vehicles against approved weight, non-verification of e-challans *etc.* as described in succeeding paragraphs. Further, capping of maximum quantity of minerals to be mined was provided for each *ghat* in the IT system.

However, it was observed in DMO, Patna that 46,68,862 cubic feet⁸ sand (22 *per cent*) was extracted in excess by the lessee in Udaipur sand *ghat* against approved capping in year 2018. This shows non-existence of validation control to monitor excess extractions.

Thus, the objective of placing monitoring system stands defeated and at the same time, it reveals failure of the Department in controlling illegal mining.

The matter was reported to the Department (April 2022); their reply was awaited (May 2022).













Recommendations: The Department should make functional, important modules like Geo-fencing module alongwith Radio Frequency Identification (RFID) Tags, and Global Positioning System (GPS) tracking so that the route of vehicle from source to destination can be tracked through the system using check points. Further, Department should setup the mechanism to monitor any breakdowns of vehicles carrying mineral, interception of illegal vehicles by different agencies and ensure that suitable actions are taken in such cases.

4.5 Transportation of minerals by unrealistic vehicles

Audit obtained database of e-challans for the period 2017 to 2021 for analysis. During analysis of e-challan database maintained by PMU under MGD and its verification with *VAHAN* database, it was observed that in 14 sample districts, 2,43,811 e-challans were generated using 46,935 unrealistic vehicles like ambulance, bus, auto rickshaw, car, motorcycle *etc.*, shown to be used for transporting minerals (Details in **Table-9** below). From the nature of transportation vehicles shown in database, it was not possible to carry minerals by these vehicles, therefore, it can be inferred that mineral has not been carried by these vehicles. Audit further analysed the reasons for using unrealistic vehicles on the sample basis and found that 140 unrealistic e-challans were submitted by the contractors in different works divisions. As there was no linkage of e-challan with RTO database, there was no validation control present in the e-challan database to capture the type of vehicle automatically. The vehicle data as well as the quantity of mineral loaded was being entered manually in the system by the lessees themselves. Thus, one of the possible reasons for using unrealistic e-challans and unrealistic vehicles might be to satisfy the works division's requirements for release of royalty.

⁸ Extraction in excess = Total extraction – Capping on extraction as per approved mining plan = 2,56,88,350 cft – 2,10,19,488 cft = 46,68,862 cft.

Table-9
Minor Minerals

Class of vehicle		Range of mineral carried at a time (MT)	No. of vehicles	No. of e-challans generated	Mineral weight (MT)
Ambulance		4 - 24	4	10	124.00
Bus		3.51 - 47.36	543	2,867	35,789.55
Camper Van		4 - 4	1	10	40.00
Construction Equipment Vehicle		4 - 38.97	10	12	84.97
E-Rickshaw		4 - 18	2	3	26.00
Fire Fighting Vehicle		4 - 4	2	2	8.00
Harvester		4 - 4	3	10	40.00
Maxi Cab/ Goods Carrier		0.41 - 52.21	19,762	1,24,628	10,88,830.83
Motor Cycle/ Scooter		0.14 - 52.1	15,616	62,843	6,44,178.94
Motor Cab		0.39 - 51.66	1,252	5,048	36,457.50
Motor Car		1.02 - 52.07	1,930	9,245	86,861.62
Three- Wheeler		0.16 - 52.2	7,810	39,133	3,85,385.16
Gross Total			46,935	2,43,811	22,77,826.57

In the course of further scrutiny of these e-challans, it was also observed that in 35,262 e-challans, 588 unrealistic vehicles *i.e.* motorcycle, bus, three-wheeler *etc.* were found to be used multiple times in single day like car up to 139 times, Motorcycle up to 181 times *etc.* Details of unrealistic vehicles are given in **Table-10**:

Table-10

Class of vehicle	No. of trips per day	No. of vehicles	No. of e-challans generated	Mineral weight (MT)
Bus	11-83	8	354	6,306.00
Maxi Cab/Goods Carrier	11-715	290	18,536	3,14,785.12
Motor-Cycle/Scooter	11-181	163	9,357	1,60,162.84
Motor Cab	11-115	9	328	4,952.00
Motor Car	11-139	31	1,749	33,110.00
Three- Wheeler	11-264	87	4,938	83,440.00
Total	11-715	588	35,262	6,02,755.96

Further, Audit analysed the trend of unrealistic e-challans and found that most of these were used in June. As the scheduled verification of *ghats* is carried out in July, some of the despatches seems to be shown only to justify the extractions.

This indicates that there was no input control mechanism available in the software for monitoring the number of e-challans generated for a particular vehicle. It provides lessees, a chance to generate e-challans in excess using identical vehicle numbers for legalising the amount of extraction and storage of minerals, hence, undermines the purpose of implementation of e-challan software.

Therefore, it is evident that minerals were shown as despatched on unrealistic vehicles with e-challans generated at mass level. So, e-challans were being generated by the lessees only as a customary requirement. The MGD failed to monitor and prevent this (District wise details are in **Appendix-14**).

On this being pointed out, the Department stated that unrealistic e-challans were submitted by the contractors to the Works Department. The MGD has already taken steps to integrate the database of e-challans with the *VAHAN* software. A restriction has also been placed in e-challan system on the trips undertaken by a vehicle to prevent any misuse in future.

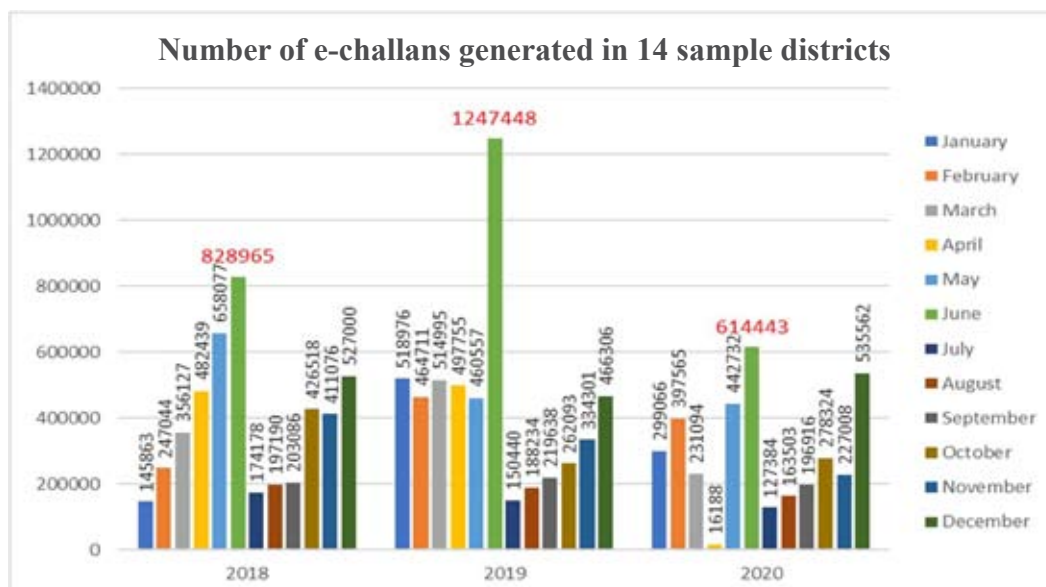
The Department has accepted the audit point and stated (17 May 2022) that the required corrective measures were being taken.

Recommendation: The Department should integrate the database of Mines & Geology Department with the *VAHAN* database to prevent the generation of e-challans on unrealistic vehicles.

4.6 Irregular generation of e-challans

As per the Department's order (every year), every lessee must stock sufficient quantity of sand before monsoon owing to non-mining in the month of July, August and September. Further, every DMO must verify the quantity of these stocks of sand before starting of the monsoon for ensuring the availability of sand in the State. To comply these orders/norms, the concerned lessees had to despatch sand for stocking which may cause frequency as well as number of the e-challans to be generated during the month of June higher than that during other months. However, Audit observed that lessees of all 14 sampled districts had generated unusually higher number of e-challans to show transportation of sand in June month as details mentioned in **Chart-11**:

Chart-11



4.6.1 Sand

Scrutiny of the sample data of these e-challans generated in the month of June for the years 2018 to 2020 revealed that identical vehicle numbers have been used for generating large number of e-challans mentioning large quantities of minerals carried beyond the possible limits of vehicle capacity. Further, it was also observed in 11 DMOs⁹ that in 15,723 cases, numbers of e-challans from 11 to 861 were generated for one vehicle in one day to carry minerals which was not possible. District wise details are shown in **Table-11**:

Table-11

District	No. of vehicles used	No. of cases	No. of trips of vehicles per day	No. of e-challans generated	Mineral weight (MT)
1. Aurangabad	440	1,271	11 to 36	17,840	3,80,134
2. Banka	252	1,130	11 to 95	19,669	2,58,117
3. Bhagalpur	6	6	12 to 25	106	724
4. Bhojpur	2,556	6,776	11 to 498	3,04,063	54,51,967
5. Gaya	179	507	11 to 69	9,432	1,51,650
6. Nalanda	59	319	11 to 42	5,040	86,708
7. Nawada	559	1,540	11 to 861	69,730	13,29,062
8. Patna	1,695	3,901	11 to 597	1,54,378	29,51,862
9. Rohtas	185	252	11 to 22	3,386	76,780
10. Siwan	1	1	19 to 19	19	342
11. Vaishali	12	20	11 to 15	244	4,176
Grand Total	5,104¹⁰	15,723	11 to 861	5,83,907	1,06,91,522

⁹ Aurangabad, Banka, Bhagalpur, Bhojpur, Gaya, Nalanda, Nawada, Patna, Rohtas, Siwan and Vaishali.

¹⁰ In 5,944 vehicles, there are 5,104 vehicles with different registration numbers.

4.6.2 Stone

Audit further observed that in four districts *i.e.* Aurangabad, Gaya, Nawada and Sheikhpura, the concerned lessees used to despatch stone during 2018 to 2020, for which e-challans were generated for more than 10 to 142 times in a day for a particular vehicle. It has been found that total 794 number of cases generating 11,397 e-challans for 294 different vehicle numbers found to carry 2,52,432.53 MT of stones in four districts. Details are given in **Table-12**:

Table-12

District	No. of vehicles used	No. of cases	No. of trips of vehicles per day	No. of e-challans generated	Mineral weight (in MT)
Aurangabad	6	6	11 to 12	70	2,587.89
Gaya	105	285	11 to 52	3,864	69,401.66
Nawada	24	25	11 to 36	357	6,310.87
Sheikhpura	163	478	11 to 142	7,106	1,74,132.11
Grand Total	294¹¹	794	11 to 142	11,397	2,52,432.53

The matter was reported to the Department (April 2022); their reply was awaited (23 May 2022).

Recommendation: The Department should put in a validation control based on the destination location in the system so that irregular generation of challans in a single day could be avoided.

4.7 Fake e-challans used in works divisions

Rule 40 (10) of BMMC Rules, 1972 provides that works contractor shall purchase minerals from lessee/permit holder and authorised dealers only. Works Department shall not accept the bill by which the works contractor submits to recover cost of mineral used by them, unless the same is accompanied with prescribed forms 'M' and 'N'. These forms describe the names and addresses of the dealers from whom the minerals were purchased.

As per notification (September 2019) of MGD, M and N system was eliminated, and e-challan of minerals consumed in works was to be verified by concerned works divisions itself through e-challan verification web portal.

During scrutiny of records related to works divisions and DMOs, total 33,191 number of e-challans in different works divisions were verified by Audit. Out of which, 21,192 e-challans were found fake which were used in different construction works in 16 works divisions, as detailed in **Appendix-15**. Of these 8,169 fake e-challans were earlier declared as verified and valid by the concerned DMOs, as per the records of works divisions. When Audit requisitioned DMOs about such verification, DMOs denied having verified such e-challans. Audit also analysed the letter outward register at DMO offices and noticed that letters from DMOs regarding verifying the mineral were not found in records. Therefore, it was found that not only e-challans but the verification letters were also fake.

¹¹ In 298 vehicles, there are 294 vehicles with different registration numbers.

This constitutes outright fraud and needs to be investigated further by MGD in consultation with the works divisions. Further, it was also observed that the works divisions neither recovered royalty nor imposed penalty on concerned works contractors. This resulted into not only loss of Government revenue but it also promoted illegal mining. The images below highlight the differences between actual e-challan and fake e-challan:

The image compares an original e-challan (left) and a fake e-challan (right). The original e-challan (green box) has a number 84521191204091013130 and a date of 04 Dec 2019 09:10:13 AM. The fake e-challan (red box) has a number 82671126143694527626 and a date of 43-61-2012. A table in the center lists the fields of the e-challan, and arrows point from the table to the corresponding fields in both documents. The table shows that the 'Year of issuance of challan' is 19 for the original and 12 for the fake, and the 'Date of issuance of challan' is 04 for the original and 09 for the fake.

Challan No.	Description
8452	User id
1	User type
19	Year of issuance of challan
12	Month of issuance of challan
04	Date of issuance of challan
09	Hour of issuance of challan
10	Minutes of issuance of challan
13	Seconds of issuance of challan
130	Milliseconds of issuance of challan

ORIGINAL ECHALLAN
 Date as per fake challan 43-61-2012
 Not same as date and time of issuance of e-challan.

FAKE ECHALLAN
 = Same as date and time of issuance of e-challan

The matter was reported to the Department (April 2022); their reply was awaited (May 2022).

Recommendation: The MGD should develop co-ordination mechanism with works divisions and Departments to ensure that the authenticity of e-challans are being regularly checked in works divisions so that the loss of royalty and misuse of e-challans could be avoided.

4.8 Loss of revenue due to irregular/illegal verification of form M and N : ₹ 5.80 crore

Rule 40 (10) of BMMC Rules, 1972 provides that works contractor shall purchase the minerals from lessee/permit holder and authorised dealers only. Works Department shall not accept the bill by which the works contractor submits to recover cost *etc.* of mineral used by them unless the same is accompanied with prescribed forms 'M' and 'N'. These forms describe the names and addresses of the dealers from whom the minerals were purchased.

Further, Section 21 (5) of the MMDR Act, 1957 read with Rule 40(8) of the BMMC Rules, 1972 provides that whenever any person, without any lawful authority, raises any mineral from any land, the State Government may recover from such person the minerals so raised, or, where such minerals has already been disposed of, the price thereof, and may also recover from such person, rent, royalty or tax, as the case may be.

The Principal Secretary, Mines and Geology Department with the approval of the Chief Secretary, Government of Bihar, had also issued instruction (January 2016) to all works departments to deduct penalty equivalent to royalty along with royalty if the works contractor had not submitted the form 'M' and 'N' along with bills as per provision of BMMC Rules. Further, Department instructed all Works Departments to furnish quarterly statement of deduction and remittance of royalty and remit the amount already deducted as royalty from the bills of works contractor and kept with the works division into mining head.

Further, MGD issued SOP in February 2019 regarding verification of form M and N. As per SOP, all works divisions must send form M and N received from works contractor to the Department for its verification and the Department would verify the same through concerned DMOs. The same procedure was applicable for minerals procured from other States.

Audit observed in six works divisions¹² in two districts¹³ that 16 contractors produced form M and N of minor minerals (stone aggregate/GSB, sand, murrum and bricks) consumed in 17 different works in the concerned divisions. The works divisions sent the M and N to concerned DMOs (Sheikhpura, Nawada and Bhagalpur) for its verifications and the same was verified by the concerned DMOs. Further, the concerned divisions did not deduct royalty from contractor's bill after receipt of form M and N. But, in course of audit no documents related to verification of above M and N forms were found in the records of concerned DMOs. Further, Audit scrutinised the outward/despatch register and no letter regarding verification of above form M and N was found. This also shows lack of co-ordination between Works Department

¹² (i) RWD, Harnaut, (ii) RWD, Biharsharif, (iii) BCD, Bhagalpur, (iv) RCD, Bhagalpur, (v) Minor irrigation division, Bhagalpur and (vi) NH division, Bhagalpur.

¹³ Bhagalpur and Nalanda.

and MGD. Audit further observed that concerned works divisions irregularly sent form M and N received from six contractors in seven different works directly to Sub Divisional Land Reforms Officer, Suri sadar, Birbhum, Government of West Bengal against the SOP of verification of form M and N. Further, one contractor in one work verified the form M and N himself from concerned MO and sent the verification letter to concerned division and got relief from deduction of royalty.

This not only constituted a fraud against the Government but at the same time, the Government suffered a loss of ₹ 5.80 crore in shape of royalty which was not deducted from the bills of contractors by the works divisions in the event of irregular/illegal verification of form M and N (Detailed in **Appendix-16**).

The matter was reported to the Department (April 2022); their reply was awaited (May 2022).

Recommendation: The Department should investigate upon the above matter regarding availability of fake verification letters from mining offices and fix responsibility on erring officials.

