



VANISHING MOUNTAINS: A STUDY OF ILLEGAL MINING IN THE ARAVALLIS OF SOUTH-WESTERN DISTRICTS OF HARYANA AND ITS EFFECT ON THE PHYSICAL ENVIRONMENT AND HUMAN LIFE

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ABSTRACT Illegal mining activities have been rampant since decades. These activities have literally changed the face of the landscape. The mountains have disappeared, surface have been left dotted with deep mining pits, villagers have to live a substandard life due to the negative effects of mining in the form of decreased water quality, poor air quality, mining related accidents, damaged houses because of stone blasting and much more. The authorities have turned a blind eye towards the common man's problem and thus the residents of nearby villages are left with no choice but to live under silence. The unscientific and illegal mining practices in the south-west region of Haryana in the districts of Mehandargarh, Dadri and Bhiwani has altered the physical landscape and affected the socio cultural life of nearby villages to a great extent. The study is a step in the direction of describing how an anthropogenic activity if done without any rules and order and in unscientific manner can affect the environment to unimaginable

KEYWORDS : Open pit mining, mining scar, rock fall, boulder fall.

INTRODUCTION

Aravalli range is the oldest mountain range of Indian subcontinent, running for 670 km, in south west direction. It starts from Delhi as Delhi ridge and covers the state of Haryana, Rajasthan and reaches all the way to Gujrat, In Haryana this range is found in southern and south western districts, namely, Gurgaon, Faridabad, Mewat, Rewari, Charkhi Dadri, Mahendargarh and Bhiwani. This study focuses on the south-western districts of Haryana i.e. Mehandargarh, Bhiwani and Dadri. This region is dotted with isolated hillocks which are the sites of illegal mining activities going unabated since decades. Mining in this region is carried out by open pit mining method where operations are mainly carried out on the surface without construction of any underground shafts. The hills of this region are mainly mined for their granitic rocks which are used in various construction purposes. Isolated hillocks are generally located adjacent to villages and thus the mining operations in this region is tightly linked to physical as well as socio-cultural environment of this region. Therefore this study focuses on the effects of illegal mining activities on the physical environment and human lives. This is largely a descriptive study conducted using various secondary data sources such as Google earth, News article, reports and journals.

Study Area

Present study focuses on the region of southwest Haryana covering the districts of Bhiwani, Mahendargarh and Dadri. The area was chosen because of the absence of any study focusing on the effect of illegal mining activities on the physical landscape and human life in this region.

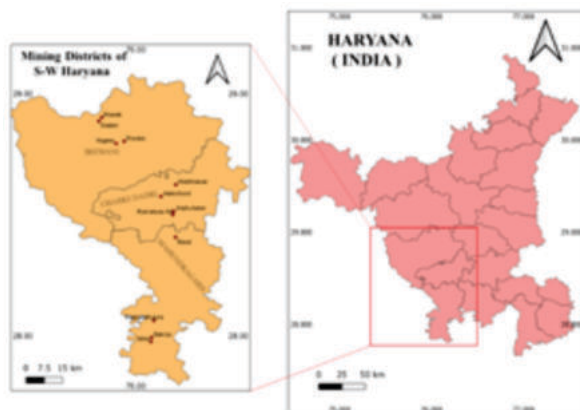


Fig1. Study Area

The districts of Charkhi dadri, Mehandargarh and Bhiwani belong to semi- arid areas region of Haryana. The semi-arid region is largely concentrated in the south-western region of Haryana and experiences dry climate because of its location in the rain shadow region. The region experiences dry climate because of the less rainfall in this region during south- west monsoon. Much of the moisture gets dried out before the arrival of monsoon winds in this region. The strength of monsoon winds also gets reduced because of the location of this region

parallel to the Arabian Sea branch of south-west monsoon. It is geographically contiguous to Rajasthan because of its climate and landscape. The Aravalli range in these district is present as scattered and isolated hillocks of low heights. These hillocks are the main centre of attraction for illegal miners because of their geology, as granitic hills are mined for the stones for construction purposes and it is because of this the mining mafias are extremely active in this region.



Fig 2. Locations Of Mining Areas In S-W Districts Of Haryana.

Table 1. Locations Of Mining Centres In S-W Haryana along with Latitude and Longitude

District	Location	Latitude, longitude
Bhiwani	Dadam	28.8858, 75.8482
	Khanak	28.9010, 75.8600
	Riwasa	28.8025, 75.9528
	Nigana	28.7939, 75.9195
Charkhi Dadri	Mankhawas	28.6237, 76.1669
	Atela Khurd	28.5747, 76.1046
	Mahra-Kaliyana	28.5616, 76.1099
	Jhojhu Kalan	28.5135, 76.1571
	Ramalwas Hill	28.4997, 76.1543
Mehandargarh	Basai	28.4063, 76.1659
	Tehla	27.9749, 76.0639
	Tajpur	27.9932, 76.0661

	Bakrija	27.9175, 76.0543
	RaghunathPura	28.0627, 76.0758

METHODS AND TECHNIQUES

The study made extensive use of secondary data in the form of satellite images and news articles which were acquired from various internet sources. For the study and interpretation of mining areas, it was necessary to have multi temporal high resolution imagery for which Google earth was used. The data regarding mining activities and their resultant effects was gathered through different online news sources such as Times of India, The Tribune etc. The location of mining activities was identified by locating mining scars in the hills.

Aims And Objectives Of The Study

The aim of the study is to act as a repository of knowledge about the harmful effects of mining, especially illegal mining which has been taking place in the south- western districts of Haryana. The poor coverage of this region in terms of research studies done to study the mining activities in Aravallis of Haryana was a key factor for the selection of this particular region.

RESULTS OF THE STUDY

Effect Of Mining On The Physical Landscape

Flattening Of Hills

Indiscriminate mining of the granitic hills for the purpose of construction leads to rapid deterioration of the physical landscape of the hills. The unscientific and illegal mining in the area leads to rapid decrease in the area of the hills and leads to both hill flattening and disappearance. Mining and quarrying of the Aravalli leads to irreversible destruction of the hills. According the report given by a supreme court appointed committee in 2018, 31 out of 218 hills in the Rajasthan had been flattened because of indiscriminate mining [1].

Based on the observation of the data available on Google earth, it was found that 6 out of 14 mining location in the districts of Charkhidabri, Mahendragarh and Bhiwani were either on the verge of flattening or their area had been decreased to a great extent.

The google earth images shown below clearly show the extent of effect of mining of these isolated hillocks. High resolution multi temporal satellite images between the time period 2005 and 2022 were acquired through the google earth using historical imagery tool. Google earth was the preferred platform for the acquirement of images because of their high resolution which helped in easy comparison of multi temporal data and identification of features.



2005

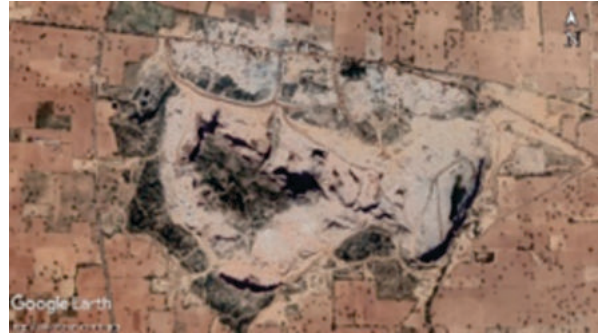


2021

Fig 3. Khanak Mines



2005



2021

Fig 4. Dadam mines

The extent of damage done to the isolated hillocks by the illegal mining activities can be easily seen through the multi temporal satellites. In Fig 4. Dadam hills were completely intact in 2005 but due to the rapid deterioration by illegal and indiscriminate mining activities the hills area suffered a great amount of reduction in its area which is clearly visible in the satellite image of 2021. The mining scars left by the mining activity are visible in the image taken in 2021 and these mining scars later on get filled with water during rainy season and become a site of great danger especially for children. No care is taken after the mining operation has completed and the hill has been exploited to its full extent. The miners do not even bother to fill these mining scars which can cause unwarranted accident in near future.

Left Out Mining Pits

Bakhrirja Mines can be cited as an classic example of how the mining activities which do not conform to the laws and regulation set by mining authorities keep exploiting the hillocks of this region even after the hillocks have been flattened. The miners do not stop there, and continue their mining operation to dig deep into the surface up to great depths, leaving deep mining in place where once stood a hill.



Fig 5a. Bakhirja Hill Flattened Due The Rapid Mining



Fig 5b. Bakhirja Mining scars

The images shown in Fig 5a and 5b clearly show that how mining activities in the south west districts of Haryana in these isolated hillocks do not bother to follow the mines and regulations which makes it illegal for miners to mine greater than limit of 2 meters above water table. The mining pits seen in Fig 5b clearly indicate that mining operations continued to take place in the region even after the hill had been completely flattened. These miners continuously dig into the ground and into the roots of mountains for their extra profit and disregard the rules and regulations. The mining pits in the Fig 5b can be seen filled with the underground water. The mining operation stopped as soon as water table was reached and pits were left as they were. The residents of the nearby village claim that mining into the greater depths has led to the decreased water table but miners keep on denying those claims. Moreover the exposed mining pits have become a perfect recipes for disaster.

Effect on the ground water

Open cast mining done beyond a certain depth affects the hydrological balance in the region of mining [2]. In the region of south-west Haryana, where the level of groundwater is already at critical level, the adverse effects of mining on ground water level and quality become a cause of concern for the local farmers.

Several reports have cited that operation of mining in the Aravalli region of Haryana has affected the ground water level. As per mining rules, mining is permitted only up to 2 metres above the ground water table [3]. In most of the cases the mining is being done beyond the permissible limits and is causing the water table to recede at greater depths. Farmers of Jhojhu Kalan village in Dadri district claim that the groundwater of tube wells has been depleting as mining activities is going on unabated in the nearby Ramalwas hills (Fig 6) which is adjacent to the fields of the villagers living in Jhojhu Kalan village. As per the claims the water level in around 150 tube wells has reached up to 200 feet. The villagers claim that mining operations are being done beyond the permissible depths and mining pits 200 feet deep are left in the open without any safety measure. One of the main causes of depletion of the ground water table was the continuation of mining activities even after the upper limit of water table was reached. The mining mafias continued to extract the stones out of water flooded pits and left those pits uncovered after the termination of mining operation [4].



2006



2018

Fig 6. Ramalwas Hills

Effects Of Human Population In The Vicinity Of Mining Areas

Loss Of Life

Illegal mining without conforming to the laws and regulations has various hazards attached to it. Neglect of responsible and ideal practices of mining has led to various incidents in which the workers of mines had to pay the price of neglecting the laws, with their lives.

It has been observed that the various incidents that have resulted in the loss of life are caused due to faulty mining practices. In Dadam mine incident, experts have noticed that mining operations was being done on a steep slope of nearly 90 degree angle without any construction of 'Benches'. According to law, in such mining projects, clear defined benches need to be constructed on the slopes after every 10-30 feet of mining. These benches are narrow strips of flat lands situated on steep slopes and are primarily constructed to arrest the momentum of boulders and debris falling from the upper part of slopes during mining operations[8].

Almost every report prepared by the NGT (National Green Tribunal) on the mining activities in Dadam hills had indicated the presence of 'unscientific and illegal' mining practices [5].

Loss of property

There have also been many instances of loss of property due to illegal mining practices. One such incident came up in Khanak mines, where several houses were damaged due to blasting operations in the mining zone. The houses situated just 500-600 metres away from mining site had suffered several cracks in their walls and some even reported the collapsing of roof. The damage was mainly caused by the vibrations caused by strong dynamite explosion used to blast the rocks [9].

Decrease in the quality of life

Indiscriminate mining in the region leads to severe air and noise pollution. As most of these mining operations are taking place on hills situated to adjacent village, the residents of these villages have to suffer from excessive air pollution caused by the presence of dust particles in the air due to blasting operations and transport activities [9].

Noise pollution is also a major issue which is due to the noise caused by mining equipment, blasting of rocks by dynamite, heavy vehicles such as trucks, JCB, bulldozers etc.

The table listed below provides details about the various incidents involving the loss of human lives due to mining activities. As no official record was available for the details of lives lost during mining operations, news reports were the next most reliable and the only source of information available, The data provided below is based on various news articles of Indian newspapers available on the internet.

Table 2. Incidents Caused Due To Illegal Mining Activity In South-west Haryana

Date of Incident	Location	Cause of Incident	Death toll	Source of information
1 January 2022	Dadam mines, Bhiwani district	Landslide at mining site	5 dead, several missing	Times of India [5]
23 April 2022	Dadam mines, Bhiwani district	Rock fall	2 dead	Times of India [5]
22 June 2019	Dadam mines, Bhiwani district	Boulder fall	1 dead	Times of India [5]
19 January 2022	Jainpur village, Mahendargarh	Landslide	1 dead	The Tribune [6]
20 March 2022	Nuh	Accident caused by overloaded Truck carrying mined stone	2 dead, 14 injured	The Indian Express [7]

A Disturbed Village Life

The villagers in general have no objection to the operations, if they are conducted according to rules and regulations. In the Dadam mine case, the villagers are mainly concerned about the way in which these operations are carried out. According to them, the sole aim of these mining operations is to make as much as profit possible, which is evident in the lack of concern regarding the safe practices. According to the village sarpanch, the miners are liable to pay Rs. 9 crore every year to the village and that money can be used for the development of the village.

But the villagers have not received a single amount of money from the mining operators thus leading to a constant environment of conflict and enmity between villagers and miners [5]. The land around the villages has also been encroached and mining operations have been expanded beyond permissible limits, leaving the lands degraded and rendered useless [5].

CONCLUSION

A part of the reason why mining mafias continue to have such strong presence in this region is the centralization of power in the local administration which does not keep regular vigil in the region and check on the illegal mining activities. Mining mafias continue to have their influence over the region through man power and fire power both. The local residents are intimidated by the mining mafias and are wary of the dire consequence they may have to face if they try to act against these illegal miners. Mining mafias are said to have strong connections within the system which always lets them remain away of the hook. Rampant corruption within the authorities is an unfortunate reality no matter how much we deny it. The one step forward in the direction of keeping illegal mining activities under check is to decentralize the power at all the levels from village, block and district to all the way up to state and centre level. Constant monitoring of mining activities in the region with the help of satellite image can enable the authorities to constantly monitor the presence of any illegal mining activity taking place.

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