

# Mining endangers plant species at Dhobil mining area of Chiria mines (West Singhbhum)

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## SUMMARY

The present investigation deals with the study and survey of vegetational pattern of Dhobil mines, an important spot for excavation and exploitation through open cast of iron-ore at Chiria. Dhobil mines has been divided into three sites as per their locations and mining activities. Site-I constitute the area of exploitation and excavation through open caste. Site-II includes activities - Transportation of iron - ore through kaccha road around Hamsadagara nalla and so large no. of dust particles containing heavy metals Fe, Cd, Pb, Mn, Zn, Ni deposited on the surface of plants and also pollutes the water of Hamsadagara nalla. Site-III shows very dense natural vegetation of trees. Shrubs and herbs on either side of Hamsadagara nalla and temporary transportation through kaccha road. A comparative study of this area shows that some plants which were recorded earlier are now found disappeared and in place which can be called as invaders such as *Lantana camera*, *Argemone mexicana*. Various kinds of grasses and aquatic plants like *Nymphae nucifera*, grass *Cynodon dactyon*, *Setaria verticillata*, *Sehina sulcatum* etc. The details of plant species of all the sites has been recorded and presented in the Table 1. Photographs and herbarium are made and preserved for future reference.

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## Key words :

Mining endangers plant species

The forest of Saranda division in the Saranda pir (Parangana) embraces the South-western extremity of the Kolhan Govt. Estate in the West Singhbhum district. It is situated at 85°16'44"E longitude and 22°18'34"N latitude. The country of Saranda forests is also known as "The Land of seven hundred hills". The landscape presents a beautiful view of hill with thickly wooded valleys and meandering live streams. Chiria mines is situated in the woodland of Saranda forest and is aggregation of different located in the heart of Saranda forest division in the West Singhbhum district (Jharkhand) and is a part of Chhota Nagpur Plateau and is marked by well – defined valleys and deep drainage channels. Ajitaburu and Budhaburu are the two prominent hills.

With rapid industrialization, increasing demand of iron- ore in the steel plants located at ISP, Burnpur , Bhilai etc; Chiria serves as a chief source of iron- mines to the above stated plants . To fulfill the requirement, the deposits is being mined by open caste method through semi – mechanized means. The various mining

activities like primary drilling, secondary drilling, blasting, sizing produce a lot of solid dust containing heavy metal like Fe, Cd, Pb, Zn, Ni, Mn. The pollutants released during mining activities not only affect the flora and fauna but human being also.

The existing latest data on the quality of air and water have been collected by NEERI (2005) and SAIL, India.

The forest of Saranda have national and international importance. Hence, an study on vegetation with relation to environment becomes essential for welfare of ecosystem and to save our natural wealth and biodiversity

## MATERIALS AND METHODS

The whole study area has been divided into three sites on the basis of their locations and type of waste produced.

Site I: Exploitation and excavation of iron-ore through open caste mining. Due to mining, the excavation soil and sub-soil is dumped or spread making it difficult for trees and other vegetation to grow.

Site II : The roadsides of mining areas are

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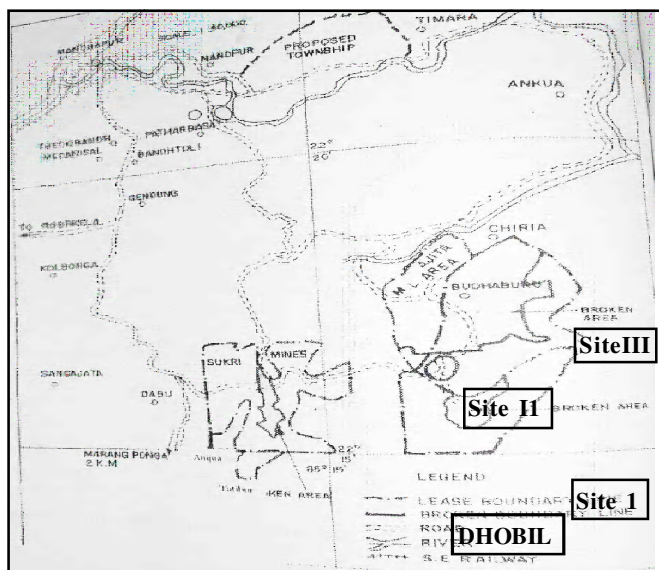


Fig. 1: Location of the study area

used for transportation of iron- ore by dumpers.

Site III : Hamsadagara nalla flows along the kachcha road side receiving dust particles containing heavy metals produced during mining activities.

The various plant species growing on different sites were collected and brought to the laboratory. The morphological characters of plant species at the different sites were studied, recorded and identification of plants were made with the help of standard literature, monographs and floras. Photographs of vegetation were also taken and made into herbarium for future reference.

### RESULTS AND DISCUSSION

The phyto-sociological studies clearly indicates that this area is highly disturbed by mining activities. The present investigation was made from November 2008 to December 2009 and during the study 38 plant species were recorded.

A comparative study between the plants of natural vegetation and of the disturbed sites revealed that a large number of plants have disappeared e.g. *Andrographis peniculata*, *Adathoda vesica*, *Mentha viridis*, *Datura stramonium*, *Polygonal glabrum* etc. and many species are endangered ex.- *Ocimum sanctum*, *Ricinus communis*, *Embllica officinale* as they were of rare occurrence (Table 1).

SPM and RSPM at Site-I and Site-II containing heavy metals like Fe, Ni, Co, Pb, Zn etc. are high (as shown in the Table 2). The plants covered with dust particles become stunted. The production of flowers, fruit are reduced which does not survive long.

The water resources at Site-III has become toxic as

it contain heavy metals like Fe, Ni, Co, Pb, Zn etc and its ratio is very high , show in the Table 3.

Table 1:

Sr. No.	Name of the plant species	Different sites		
		Site -I	Site- II	Site -III
1.	<i>Achyranthus asper</i>	+	+	+
2.	<i>Adhatoda vesica</i>	-	-	-
3.	<i>Alstonia scholaris</i>	-	+	+
4.	<i>Annona squamosa</i>	-	+	-
5.	<i>Argemone mexicana</i>	+	+	+
6.	<i>Andrograaphis peniculata</i>	-	-	-
7.	<i>Calotropis procera</i>	+	+	+
8.	<i>Cassia fistula</i>	-	+	+
9.	<i>Cassia tora</i>	+	+	+
10.	<i>Centela asiatica</i>	+	+	+
11.	<i>Croton oblongiflora</i>	-	-	+
12.	<i>Cuscuta reflexa</i>	+	+	+
13.	<i>Delbergia_sissoo</i>	+	+	+
14.	<i>Datura stramonium</i>	-	-	-
15.	<i>Embllica officinale</i>	-	-	+
16.	<i>Euphorbia hirta</i>	+	-	+
17.	<i>Ficus religiosa</i>	+	+	+
18.	<i>Ipomea palmate</i>	-	+	-
19.	<i>Lantana camera</i>	+	+	+
20.	<i>Madhuca indica</i>	-	+	+
21.	<i>Mangifera indica</i>	+	+	+
22.	<i>Malotus philipenasia</i>	-	+	+
23.	<i>Mentha viridis</i>	-	-	-
24.	<i>Mimosa pudica</i>	+	-	+
25.	<i>Ocimum basilicum</i>	-	+	+
26.	<i>Ocimum sanctum</i>	+	-	+
27.	<i>Polygonum glabrum</i>	-	-	-
28.	<i>Ricinus communis</i>	+	+	-
29.	<i>Salmia melabaricum</i>	-	-	+
30.	<i>Shorea robusta</i>	+	+	+
31.	<i>Sonchus oleraceus</i>	+	-	-
32.	<i>Syzygium cumini</i>	+	+	+
33.	<i>Tabernaemontana divaricata</i>	-	+	+
34.	<i>Terminalia arjuna</i>	-	-	+
35.	<i>Vinca rosea</i>	-	-	+
36.	<i>Woodfordia fructicosa</i>	-	+	+
37.	<i>Zizyphus jujube</i>	+	+	-

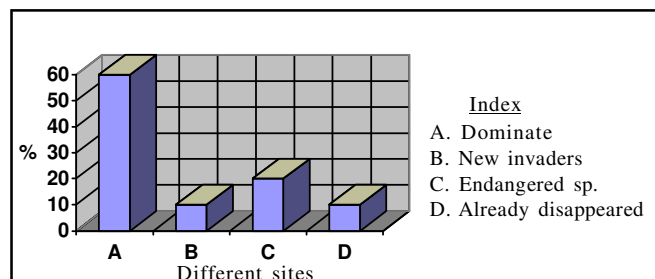


Fig. 1: Status of plant spp. at different sites

**Table 2: Air quality status (Winter-2005) 8 hourly average**

Sampling locations	SPM (Suspended particulate matter)		RSPM (Respirable suspended particulate matter)	
	Average	SD	Average	SD
Dhobil mines area	231 (28-562)	200	106 (23-211)	84
Guest - house	174 (17-380)	90	80 (11-263)	54

**Table 3: Surface water quality heavy metals (Winter 2005) unit mg/l**

Sampling location	Ni	Co	Cr	Pb	Fe	Mn	Zn
Hamsadagara	0.01	0.02	0.01	0.07	0.54	0.34	1.36
Pump-house	0.01	0.01	0.01	0.05	0.25	0.22	0.01

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