

Identification and Assessment of Bauxite Mining Activity in Western Maharashtra, India

Dr. Devidas S. Randhir

Department of Geography, Shri Sadguru Gangageer Maharaj Science, Gautam Arts and Sanjivani Commerce College, Kopargaon, District Ahmednagar, 423 601, Maharashtra, India

*Corresponding author Email: [devidas.randhir\[at\]gmail.com](mailto:devidas.randhir[at]gmail.com)

Abstract: *This study aims to identify and assess the extent of bauxite mining activity in Western Maharashtra, India. By analyzing satellite images, field observations, and official mining data, the study estimates the area of land excavated for bauxite mining. The results reveal a significant presence of bauxite mines in Kolhapur, Raigad, and Ratnagiri districts. The total land area excavated for mining in Western Maharashtra is 7, 697, 076.5 Sq. Mtrs., with the Konkan region accounting for 2, 208, 702 Sq. Mtrs. and Sahyadri region accounting for 5, 488, 375 Sq. Mtrs. These findings highlight the importance of sustainable development strategies for mining affected areas.*

1. Introduction

Opencast bauxite mining is one of the important economic activities of western Maharashtra. Opencast mining means totally degradation of Land. After mining land is not used for any other purpose. Without proper planning of restoration, reclamation and rejuvenation of Mine land, it is difficult to develop sustainable development strategies for mining affected areas. Mining is the activity, occupation, and industry concerned with the extraction of valuable minerals or other geological materials from the earth. Bauxite is one of the raw materials with high economic significance for production of aluminium; it is mined in surface operations in tropical and subtropical climates. The activity has been practiced in western Maharashtra.

Bauxite mines and its areas in the state of Maharashtra have been included in the present research work. In the state of Maharashtra bauxite deposits are found in some districts in the West. Bauxite resources in the state are of the order of 102.88 million tons which is approximately 3.38% of the country's reserve. Important bauxite deposits are located in Kolhapur, Kolaba (Raigad), Ratnagiri, Satara districts. The

occurrences are confined to the top of different plateaus of Western Ghats. The deposits are associated with laterites which rest on Deccan Trap basalt. Bauxite occurs between 1000 m – 1100 m above MSL in Kolhapur and Satara districts and at 150 m – 200 m above MSL in Ratnagiri and Kolaba districts. It includes western districts of Kolhapur, Raigad, Ratnagiri, Sindhudurg, Satara and Thane (IBM, 1914). Bauxite mining has also been practiced illegally at many places in these districts. In the present research work, only the government - approved bauxite mines have been selected for the study. Government approved bauxite mines of Kolhapur, Raigad and Ratnagiri districts and its impacted area is the study area of present research work.

2. Study Area

The study area consists of bauxite mining sites of Western Maharashtra. It includes three districts which are Kolhapur, Raigad and Ratnagiri (Fig.1.1). All government sanctioned bauxite mines and its affected area of western Maharashtra is the study area of present research work (see figure no.1.1 to 1.9).

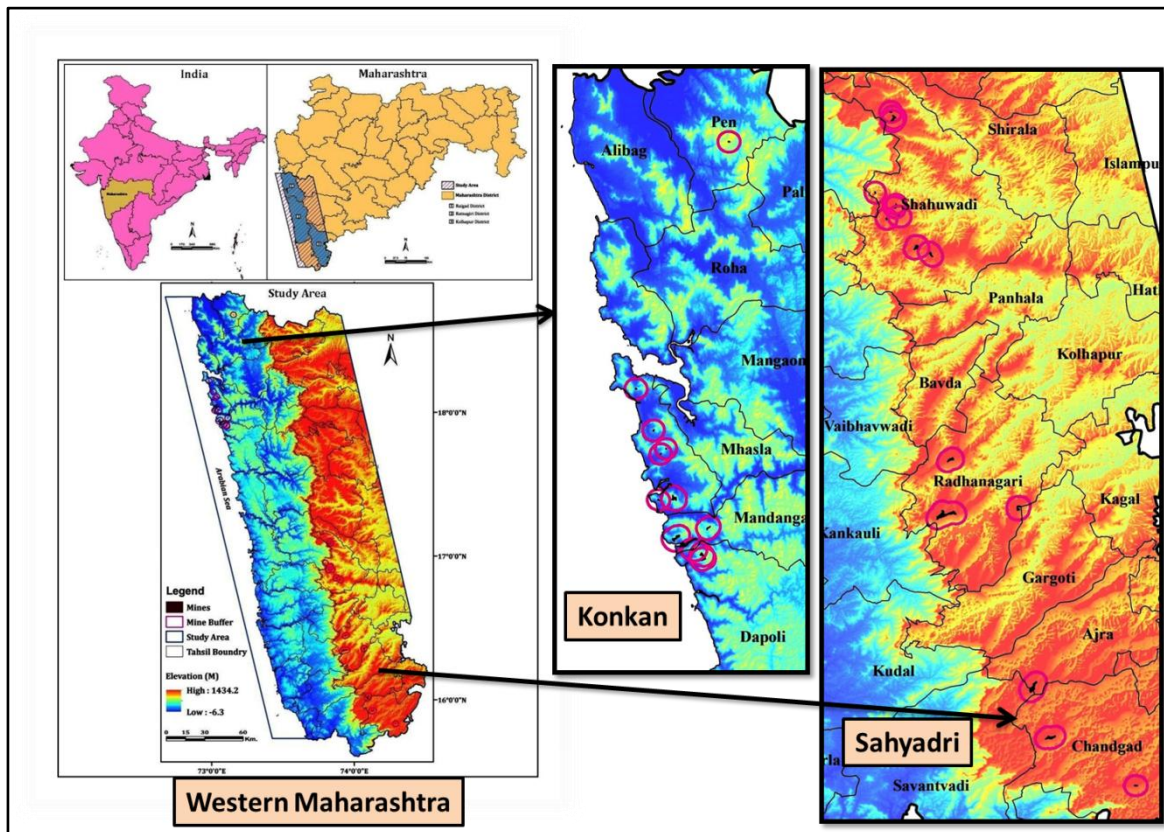


Figure 1.1: Location Map of Study Area

3. Methodology

The information about bauxite mining projects, which were leased by government of Maharashtra in western region was obtained from Indian Bureau on Mines, Nagpur, and district collector office of Kolhapur. Out of sanctioned projects how many mines are in operations have been identified with the help of ‘google earth images’ where bauxite mines are actual leased on. Along with this, the information has been verified by actually visiting the leased area.

Information on area excavated for bauxite mining was obtained using different approach. For this following method was adopted

- Extraction of mine area through shape files from Bhuvan and Google Earth images.
- Importing the extracted shape files in GIS software.
- Measuring the mining area by polygon digitization.

4. Results

A) Identification of Bauxite Mines:

The information of sanctioned bauxite mining projects of the state of Maharashtra has been given in table 1.1.

Table 1.1: Mining Leases for Bauxite Minerals for the Year Ending 31/3/2014 in the Maharashtra State

S. N	Name of the lessee	Tehsil	Date of Original lease grant	Period for which granted	Total Period
Kolhapur District					
1	M/s Hindalco Industries Ltd.	Chandgad	02/10/1968	21/05/1998 to 20/05/2018	20
2	M/s Hindalco Industries Ltd.	Chandgad	02/10/1968	21/05/1998 to 20/05/2018	20
3	M/s Hindalco Industries Ltd.	Chandgad	02/10/1968	21/05/1968 to 20/05/1998	30
4	M/s Hindalco Industries Ltd.	Radhanagari	02/10/1968	21/05/1998 to 20/05/2018	20
5	M/s Hindalco Industries Ltd.	Radhanagari	02/10/1968	21/05/1998 to 20/05/2018	20
6	Shri V. K. Vatkar,	Shahuwadi	02/10/1968	01/04/2001 to 31/03/2021	20
7	M/s Swati Minerlas	Shahuwadi	19/07/1985	20/06/1995 to 19/06/2015	20
8	Prakash Ananadrao Gaikwad	Shahuwadi	16/10/1999	30/09/2000 to 29/09/2020	20
9	M/s Bhartesh Construction Com.	Shahuwadi	20/06/2000	08/12/2000 to 07/12/2030	30
10	M/s Panditrao mines & Minerals	Bhudargad	02/01/2001	30/10/2003 to 29/10/2033	30
11	M/s Mahalaxmi Mining Compa.	Shahuwadi	30/03/2001	29/09/2001 to 28/09/2021	20
12	M/s Shivram minerals	Shahuwadi	22/04/2002	21/04/2003 to 20/04/2033	30
13	M/s Warna Minerals	Shahuwadi	19/09/2002	11/08/2003 to 10/08/2033	30
14	Chairman Sahyadri Dongri Vibhag	Shahuwadi	20/01/2003	27/10/2003 to 26/10/2033	30
15	Shri P. Z. Gawade, Samarth Niwas	Shahuwadi	05/06/2004	29/01/2005 to 28/01/2035	30
16	M/s Hindalco Industries Ltd.	Shahuwadi	29/01/2008	05/05/2008 to 04/05/2038	30
Raigad District					

17	M/s Vyagreshwar Minerals	Pen	08/03/1978	13/12/1998 to 12/12/2018	20
18	M/s Bhartesh Construction Com.	Shrivardhan	06/03/2000	05/02/2002 to 04/02/2032	30
19	M/s Bhartesh Construction Com.	Shrivardhan	01/02/2001	05/02/2002 to 04/02/2032	30
20	M/s Bhartesh Construction Com.	Shrivardhan	01/02/2001	31/12/2002 to 31/12/2032	30
21	M/s Altage Stone Crushing Indus.	Shrivardhan	01/02/2001	31/12/2002 to 31/12/2032	30
22	M/s Altage Stone Crushing Indu.	Shrivardhan	01/02/2001	01/06/2009 to 30/05/2039	30
23	M/s Bhartesh Construction Com.	Shrivardhan	30/10/2002	07/04/2003 to 06/04/2033	30
24	M/s Altage Stone Crushing Indus.	Shrivardhan	16/08/2003	05/11/2003 to 04/11/2033	30
25	Shri Manohar V. Daryanani, 3/4	Shrivardhan	29/12/2004	11/03/2008 to 10/03/2038	30
Ratnagiri District					
26	Shri S. D. Dhanavate, "Shrayas"	Mandangad	07/08/1968	29/11/89 to 28/11/2009	20
27	M/s Veet Rag Homes Pvt. Ltd.,	Rajapur	25/09/2003	01/03/2004 to 28/02/2034	30
28	M/s Ashapura MinechemLtd.	Dapoli	21/12/2004	04/01/2005 to 03/01/2025	20
29	M/s Chetan N. Shah, C/o Ashapura	Dapoli	21/12/2004	04/01/2005 to 03/01/2035	30
30	M/s Dinesh Trikhud, Saikripa	Dapoli	02/03/2005	15/02/2005 to 14/02/2025	20
31	M/s Ashapura MinechemLtd.	Dapoli	02/03/2005	15/02/2005 to 14/02/2025	20
32	M/s Infrastructure Logistics	Mandangad	27/07/2010	27/08/2010 to 26/08/2030	20
Sindhudurg District					
33	M/s Indian Aluminium Co.,	Sawantwadi	10/02/1968	23/5/1968 to 22/5/1998	30

(Source: IBM 2014)

The government has leased 33 bauxite mining projects in western Maharashtra. While studying leased mining projects it has been noticed that in Kolhapur district date of first original leased grant is 02.10.1968 whereas its period for its grant is from 21/5/1998 to 20/5/2018. In Raigad district; date of first original leased grant is 08/03/1978 whereas its period is from 13/12/1998 to 12/12/2018. In Ratnagiri district date of first original leased grant is 07/08/1968 whereas its period for grant is from 29/11/89 to 28/11/2009. In Sindhudurg district date of first original leased grant is 10/02/1968 whereas its period for grant is from 23/5/1968 to 22/5/1998.

In Maharashtra, the government has leased only these four districts for bauxite mining projects. Through this information, it has been understood that in Maharashtra, before 1968, no mining project has been leased by the government. In brief, it means before 1968 there was no bauxite excavation registered.

Though government has above - mentioned leases, in reality the number of mines at work are 28 (table 1.2). This information was obtained from the Indian Bureau of Mines which was verified from Google earth images and by physically visiting the mine sites.

Table 1.2: Bauxite Mines Operating in Maharashtra

Sr. No.	Name of Mine	Latitude and Longitude
1	Minche Budruk Bhudargad Kolhapur	16°21'25.29"N, 74°04'05.32"E
2	Bhogoli - Pilani Chandgad Kolhapur	15°55'20.97"N, 74°07'40.96"E
3	Kanurkurd - Pundra - Dhamapur - Latgaon - Awandi - Ajra Chandgad Kolhapur	16°00'56.49"N, 74°05'36.78"E
4	Kitvade Hajgoli Chandgad Kolhapur	15°49'56.51"N, 74°17'22.25"E
5	Durgamwadi - Padsali Radhanagari Kolhapur	16°26'53.65"N, 73°56'23.67"E
6	Karanje - Ramanwad - Patpanhali Radhanagari Kolhapur	16°20'53.41"N, 73°56'47.07"E
7	Burambal - Panundre - Ringewadi Shahuwadi Kolhapur	16°50'15.38"N, 73°54'04.67"E
8	Dhangarwadi Shahuwadi Kolhapur - 1	15°55'47.57"N, 73°50'11.01"E
9	Dhangarwadi Shahuwadi Kolhapur - 2	16°55'27.86"N, 73°50'05.45"E
10	Girgaon Shahuwadi Kolhapur	16°50'52.39"N, 73°52'31.67"E
11	Manoli Shahuwadi Kolhapur	16°57'06.82"N, 73°47'49.38"E
12	Niwale Shahuwadi Kolhapur	17°06'15.97"N, 73°49'32.84"E
13	Pandharepani Shahuwadi Kolhapur	16°54'07.18"N, 73°49'06.15"E
14	Udgi Shahuwadi Kolhapur - 1	17°05'14.00"N, 73°49'49.97"E
15	Udgi Shahuwadi Kolhapur - 2	17°05'33.67"N, 73°49'54.35"E
16	Yelwanjugai Shahuwadi Kolhapur	16°54'24.57"N, 73°50'33.29"E
17	Mahalmirya Dongar Pen Raigad	18°40'44.08"N, 73°09'06.84"E
18	Bagmandala - Danda Shrivardhan Raigad	18°00'58.99"N, 73°03'00.56"E
19	Dandguri - Khujare Shrivardhan Raigad	18°08'32.33"N, 73°00'42.15"E
20	Deokhol Shrivardhan Raigad	18°06'30.86"N, 73°02'06.75"E
21	Kudgaon - Harvit Shrivardhan Raigad	18°13'11.47"N, 72°58'46.97"E
22	Kurawade - Maral Shrivardhan Raigad	18°00'47.92"N, 73°01'16.04"E
23	Meghare Shrivardhan Raigad	18°05'55.86"N, 73°01'31.59"E
24	Kavadoli Dapoli Ratnagiri	17°54'14.58"N, 73°06'15.37"E
25	Rowale Dapoli Ratnagiri	17°54'43.82"N, 73°06'05.79"E
26	Umbarshet Dapoli Ratnagiri	17°55'13.59"N, 73°05'15.10"E
27	Gudheghar Mandangad Ratnagiri	17°54'41.98"N, 73°06'48.24"E
28	Sakhari - Velas, Dighi Mandangad Ratnagiri	17°56'30.34"N, 73°03'10.03"E

B) Areas of Excavated Landmass:

In western Maharashtra, overall 28 mines have been found to be excavated. The excavated areas of mines have been calculated mine - wise information of this is provided in table 1.3

Table 1.3: Mine wise Area of Excavated Landmass (in Square Meters)

Sr. No	Name of Mine	Code	Area of the Mine (in Sq. Meters)
1	Minche Budruk Bhudargad Kolhapur	MBBK	276363
2	Bhogoli - Pilani Chandgad Kolhapur	BPCK	580324
3	Kanurkhurd - Pundra - Dhamapur - Ajra Chandgad Kolhapur	KACK	938476
4	Kitvade Hajgoli Chandgad Kolhapur	KHCK	86687
5	Durgamwadi - Padsali Radhanagari Kolhapur	DPRK	379212
6	Karanje - Ramanwad - Patpanhali Radhanagari Kolhapur	KPRK	1724172
7	Burambal - Panundre - Ringewadi Shahuwadi Kolhapur	BRSK	267547
8	Dhangarwadi Shahuwadi Kolhapur - 1	DSK1	7994.5
9	Dhangarwadi Shahuwadi Kolhapur - 2	DSK2	103465
10	Girgaon Shahuwadi Kolhapur	GSK	457219
11	Manoli Shahuwadi Kolhapur	MSK	42572
12	Niwale Shahuwadi Kolhapur	NSK	67976
13	Pandharepani Shahuwadi Kolhapur	PSK	39241
14	Ud giri Shahuwadi Kolhapur - 1	USK1	200843
15	Ud giri Shahuwadi Kolhapur - 2	USK2	206910
16	Yelwanjugai Shahuwadi Kolhapur	YSK	109373
17	Mahalmirya Dongar Pen Raigad	MDPR	60315
18	Bagmandala - Danda Shrivardhan Raigad	BDSR	443606
19	Dandguri - Khujare Shrivardhan Raigad	DKSR	36227
20	Deokhol Shrivardhan Raigad	DSR	26530
21	Kudgaon - Harvit Shrivardhan Raigad	KHSR	47913
22	Kurawade - Maral Shrivardhan Raigad	KMSR	33517
23	Meghare Shrivardhan Raigad	MSR	21894
24	Kavadoli Dapoli Ratnagiri	KDR	374679
25	Rowale Dapoli Ratnagiri	RDR	246135
26	Umbarshet Dapoli Ratnagiri	UDR	262329
27	Gudheghar Mandangad Ratnagiri	GMR	116223
28	Sakhari - Velas, Dighi Mandangad Ratnagiri	SDMR	539334
	Totals of Western Maharashtra		76, 97, 077 sq. mts.

C) Identified Bauxite Mines

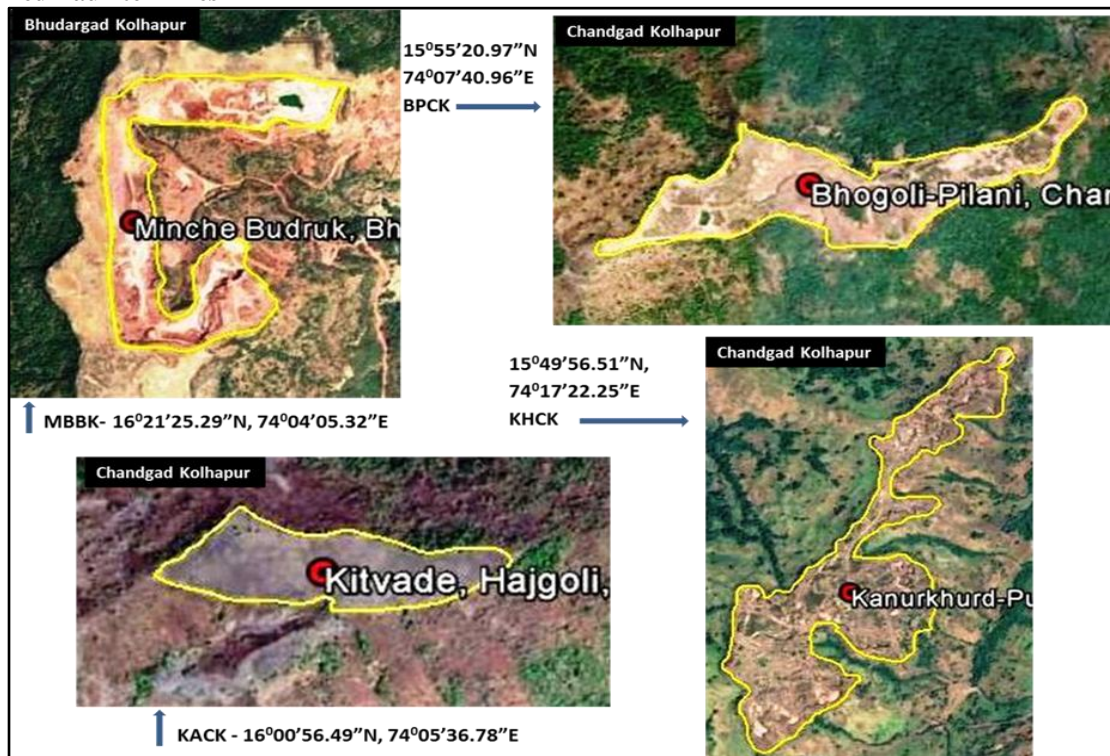


Figure 1.2: MBBK, BPCK, KACK and KHCK Mines Location

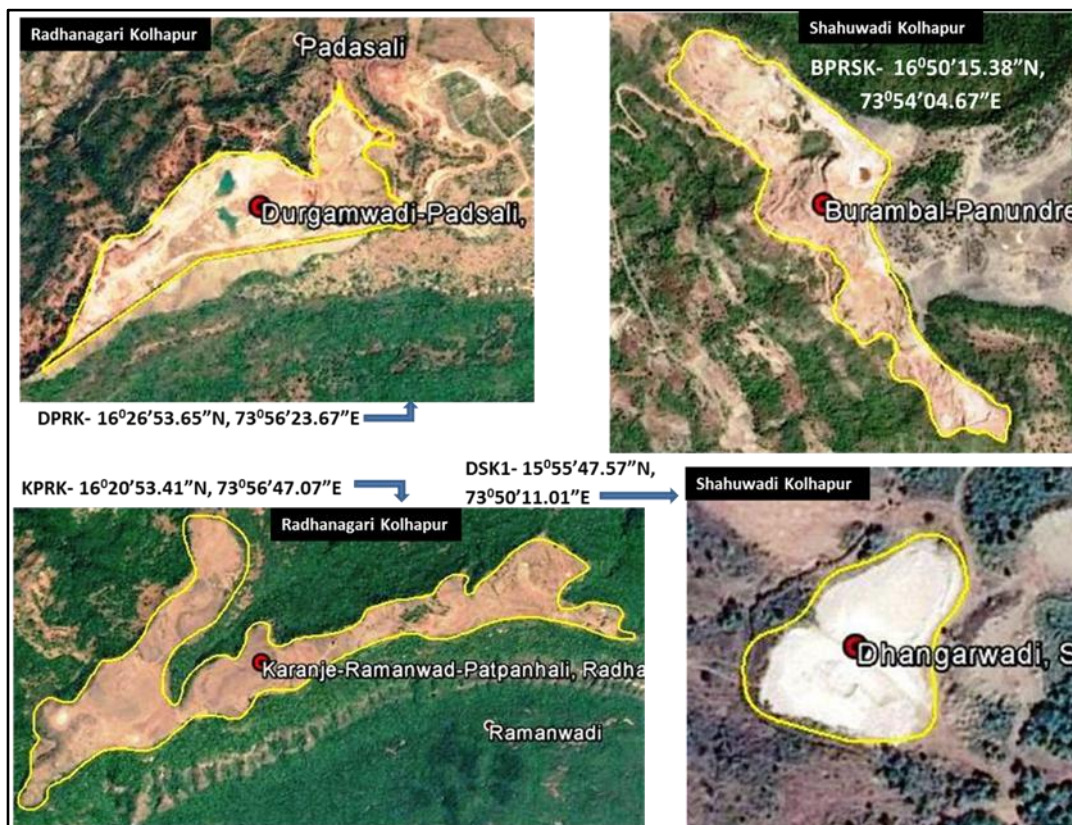


Figure 1.3: DPRK, KPRK, BPRSK and DSK1 Mines Location

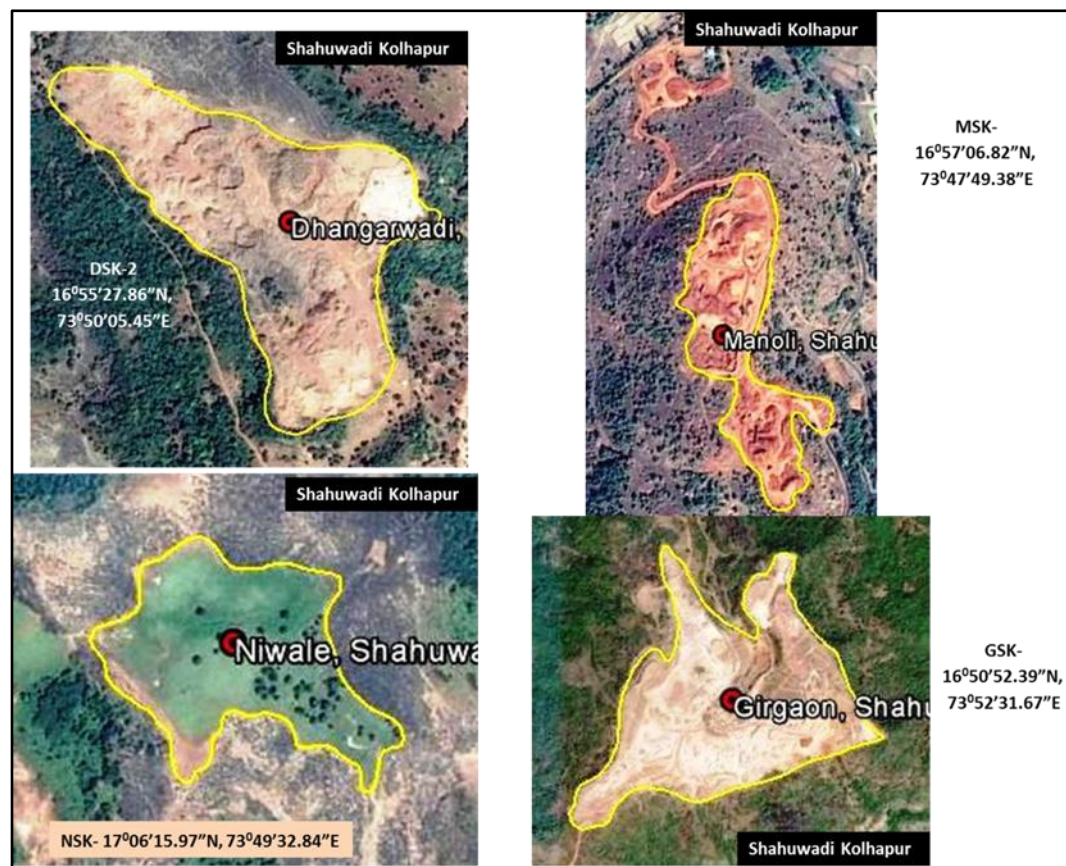


Figure 1.4: DSK2, NSK, MSK and GSK Mines Location



Figure 1.5: USK - 1, USK - 2, PSK and YSK Mines Location

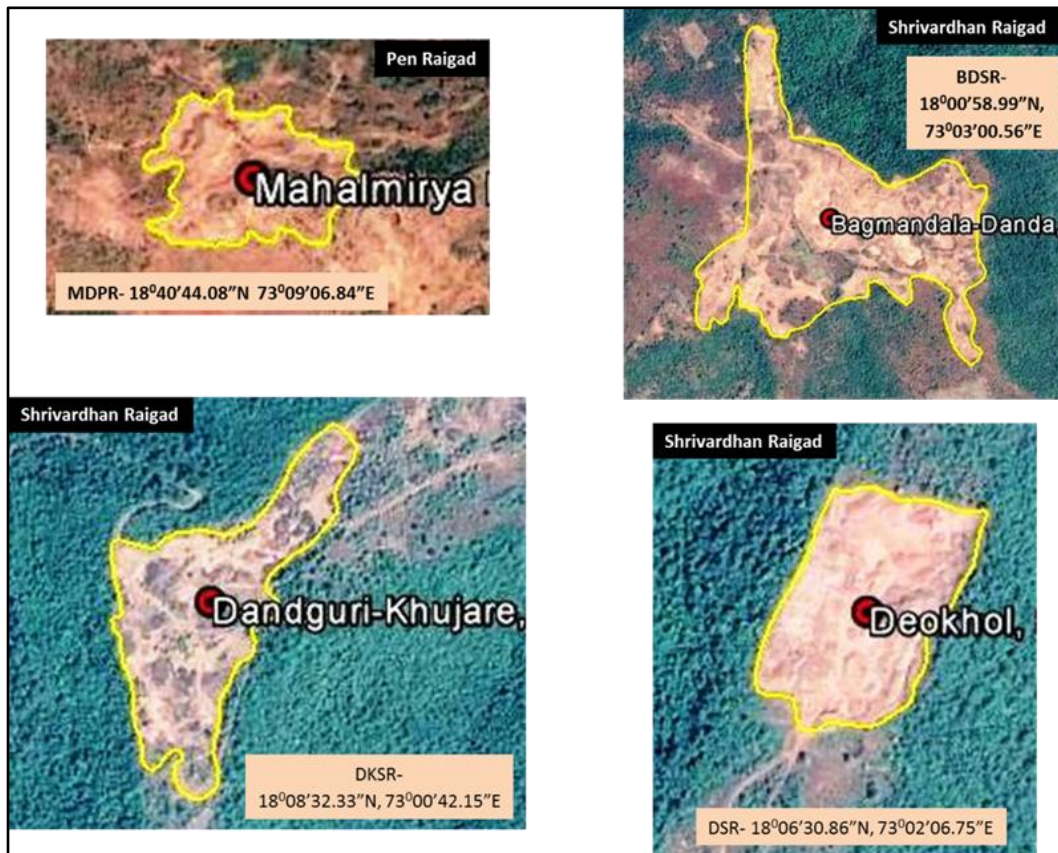


Figure 1.6: MDPR, BDSR, DKSR and DSR Mines Location

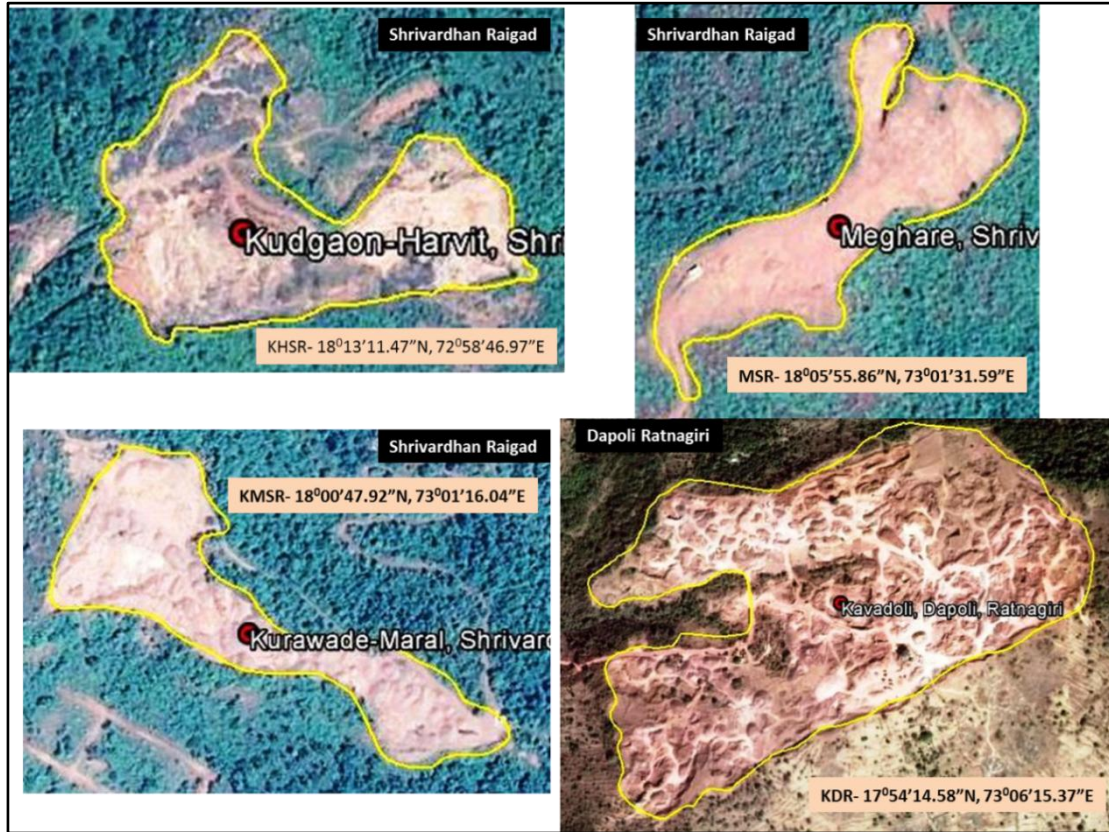


Figure 1.7: KHSR, MSR, KMSR and KDR Mines Location

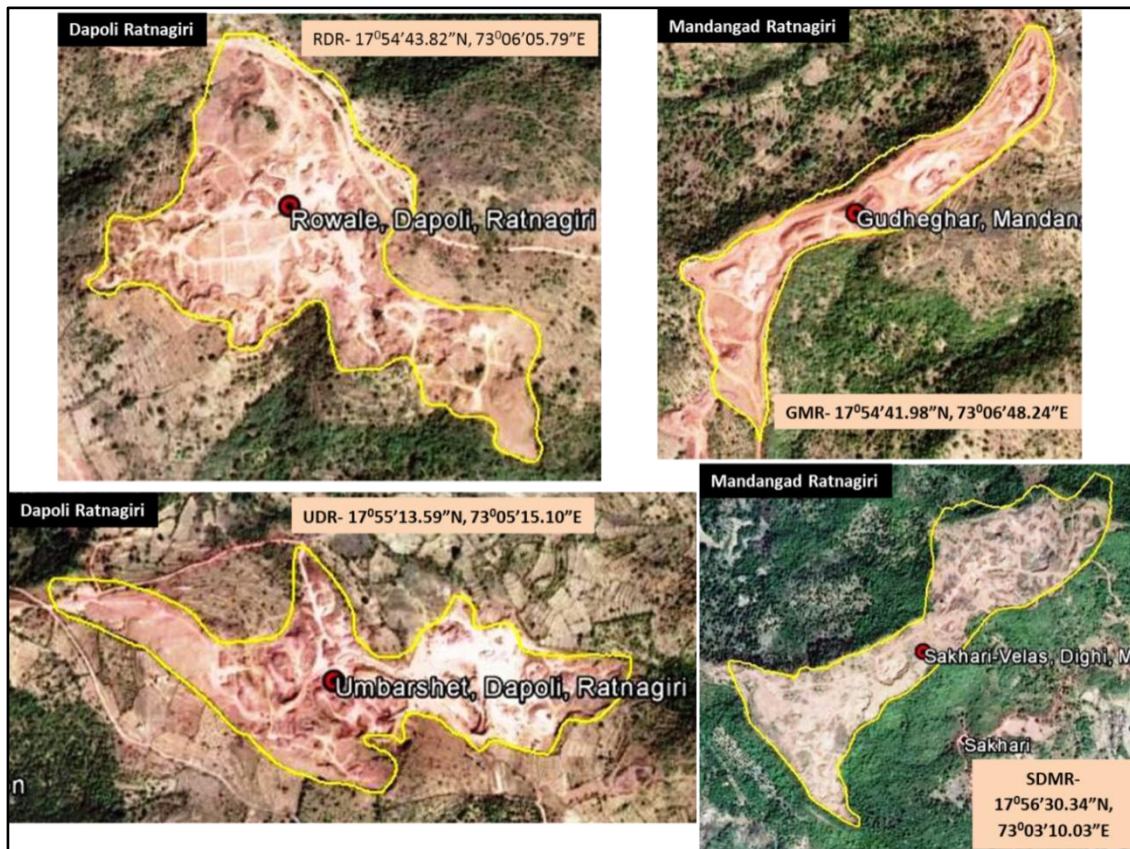


Figure 1.8: RDR, GMR, UDR and SDMR Mines Location

5. Conclusion

The following are the key and noteworthy points that can be outlined from the results presented in this chapter:

- The government has leased 33 bauxite mining projects in Western Maharashtra. Prior to 1968, no mining project has been leased by the government. Shahuwadi (9), Shrivardhan (7), Dapoli (4), Mandangad (3), Chandgad

(3), Radhanagari (2), Bhudargad (1), Pen (1), Sawantwadi (1) and Satara (1) mines have been leased for bauxite excavation.

- Government has leased above - mentioned 33 mines but actually in order to excavate bauxite minerals 28 leased mining places are observed. In Kolhapur district 16, 7 in Raigad and 5 bauxite mines in Ratnagiri districts are found. Tehsil - wise Shahuwadi (10), Chandgad (3), Radhanagari (2), Bhudargad (1), Shrivardhan (6), Dapoli (3), Mandangad (2) and Pen (1) have bauxite mines.
- The thickness of bauxite ranges from 0.3 m. to a maximum of 10.6 meters. Bauxite occurs between 1000 m – 1100 m above MSL in Kolhapur and Satara districts and at 150 m – 200 m above MSL in Ratnagiri and Kolaba districts.
- In Western Maharashtra 7, 697, 076.5 Sq. Mtrs. of Land has been excavated for bauxite mining. Out of this in the Konkan region total 2, 208, 702 Sq. Mtrs. and Sahyadri 5, 488, 375 Sq. Mtrs. of land has been excavated.

References

- [1] EIA & EMP, 2006. Report of Shirale Bauxite Mine of Anand Mines Products (P) Ltd located at Mouje Shirale turf Malkapur, Panundre and Mhalaswade Villages, Shahuwadi Taluka, Kolhapur District, Maharashtra, 2006, http://mpcb.gov.in/notices/pdf/SHIRALE%20EIA_ENGLISH.pdf
- [2] EIA & EMP, 2006. Report of Mogalgad Bauxite Mine of Hindalco Industries Ltd located at Kitwade & Hajgoli Villages, Chandgad Taluka, Kolhapur District, Maharashtra, February 2006, http://mpcb.gov.in/notices/pdf/Exe%20sum_Hindalko_Mogalgad.pdf
- [3] EIA & EMP, 2013. Report of Sakhari Bauxite Mine of M/s Ashapura Minechem Ltd located at Sakhari Village, Mandangad Taluka, Ratnagiri District, Maharashtra, http://www.mpcb.gov.in/notices/pdf/exec_summ_sakhari_bauxite_ashapura_eng.pdf
- [4] EIA & EMP, 2014. Report of Danda - Bagmandala - Saigaon Bauxite Mine of M/s. Alatge Stone Crushing Industries Ltd located at Danda - Bagmandala - Saigaon Village, Shrivardhan Taluka, Raigad District, Maharashtra, October 2014, http://environmentclearance.nic.in/writereaddata/Online/TOR/03_May_2017_1900449733CQ0QJI1PFR - DBSmine.pdf
- [5] EIA & EMP, 2015. Report of Kurwade - Maral Bauxite Mine of Alatge Stone Crushing Industries Ltd located at Kurwade and Maral Village, Shrivardhan Taluka, Raigad District, Maharashtra, December 2015, <http://mpcb.gov.in/notices/pdf/KurwadeMaral - Bauxite - Mine - ExeSummary - English.pdf>, http://environmentclearance.nic.in/writereaddata/FormB/EC/EIA_EMP/22122015O0QPZFCFinalEIAforEC.pdf
- [6] EIA & EMP, 2015. Report of Meghare Bauxite Mine of Manohar V. Daryani Ltd located at Meghare Village, Shrivardhan Taluka, Raigad District, Maharashtra, July 2015, <http://mpcb.gov.in/notices/pdf/Draft - EIA - EMP - Report - for - PH.pdf>
- [7] EIA & EMP, 2015. Report of Rowale Bauxite Mine of M/s Ashapura Minechem Ltd located at Rowale Village, Dapoli Taluka, Ratnagiri District, Maharashtra, August 2015, <http://environmentclearance.nic.in/writereaddata/EIA/18082015TXOQ7LNIEIAafterPH - Rowale.pdf>
- [8] EIA & EMP, 2015. Report of Dandguri - Khujare Bauxite Mine of Bharatesh Construction Company Ltd located at Dandguri - Khujare Village, Shrivardhan Taluka, Raigad District, Maharashtra, April 2015, <http://environmentclearance.nic.in/writereaddata/EIA/16042015B6UN0QBUANNEXUREEIA.pdf>
- [9] EIA & EMP, 2016. Report of Uttamber Bauxite Mine of Mr. Chetan Shah located at Uttamber Village, Dapoli Taluka, Ratnagiri District, Maharashtra, July 2016, <https://ercindia.org/files/eiadocuments/UTTAMBAR.pdf>
- [10] EIA & EMP, 2016. Report of Sakhari Bauxite Mine of M/s Ashapura Minechem Ltd located at Sakhari Village, Mandangad Taluka, Ratnagiri District, Maharashtra, http://www.mpcb.gov.in/notices/pdf/exec_summ_sakhari_bauxite_ashapura_eng.pdf
- [11] EIA and EMP, 2015. Report of Umbershet Bauxite Mine M/s Ashapura Minechem Ltd located at Rowale Village, Dapoli Taluka, Ratnagiri District, Maharashtra, August 2015, <http://environmentclearance.nic.in/writereaddata/EIA/19082015UOHRENDQEIAupgradedafterPH - Umbershet.pdf>
- [12] IBM, 2014. State wise Mineral Scenario, list of mining leases for Major Minerals for the year ending 31/3/2014 in the State of Maharashtra, <https://ibm.gov.in>.