

LAND RECLAMATION MONITORING BASED ON SATELLITE DATA OF THE YEAR 2024

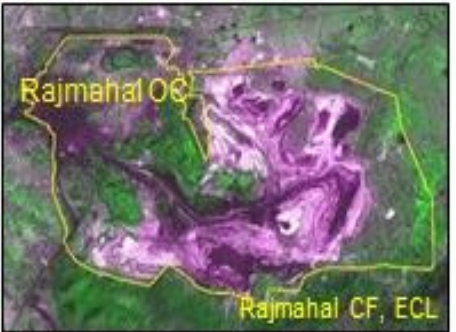
Reviving Ecosystems for Coal Mines



**Combined Report for 75 Mines Producing
Coal & OB more than 5 MTPA**

*Submitted by
Remote Sensing Cell, Geomatics Division*

Land Restoration / Reclamation Monitoring of 75 Opencast Coal Mines Projects of CIL producing more than 5 mcm (Coal+OB) annually based on Satellite Data for the Year 2024

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मिनी रत्न
cmpdi
Mini Ratna



कोल इंडिया लिमिटेड के ५ मिलियन घन मीटर (कोल+ अधिभार) से अधिक उत्पादन क्षमता वाले ७५ खुली खदानों के भूमि पुनरुद्धार हेतु वर्ष २०२४ के उपग्रह डाटा के आधार पर निगरानी का वार्षिक प्रतिवेदन

**Land Restoration / Reclamation Monitoring of 75 Opencast Coal Mines
Projects of CIL producing more than 5 mcm (Coal+OB) annually
based on Satellite Data for the Year 2024**

March- 2025



**Remote Sensing Cell
Geomatics Division
CMPDI, Ranchi**

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कार्यकारी सारांश

१.० प्रोजेक्ट

कोल इंडिया लिमिटेड के विभिन्न सहायक कंपनियों से संबंधित ५ मिलियन घन मीटर (कोल+ अधिभार) से अधिक उत्पादन क्षमता वाले ७५ खुली खदानों के भूमि पुनरुद्धार हेतु वर्ष २०२४ के उपग्रह डाटा के आधार पर वार्षिक निगरानी।

२.० उद्देश्य

भूमि पुनरुद्धार (लैंड रिक्लेमेशन) का उद्देश्य पट्टाक्षेत्र में बैकफील, वृक्षारोपण, सामाजिक वानिकी, सक्रिय उत्खनन क्षेत्र, जल निकाय (वाटर ड्रेनेज) बंजर भूमि, कृषि भूमि और जंगल के विभिन्न प्रकार के वितरण प्रणाली के क्षेत्र का आकलन करने के लिए है। यह अध्ययन न केवल उपरोक्त सभी खुली खदानों के भूमि पुनरुद्धार (लैंड रिक्लेमेशन) का निगरानी के प्रगति का आकलन में मदद करेगा बल्कि पर्यावरण संरक्षण के लिए आवश्यक उपचारात्मक उपायों को क्रियान्वित करने में भी सहायता करेगा।

३.० मुख्य निष्कर्ष

- कोल इंडिया द्वारा चयनित विभिन्न खदानों के निगरानी हेतु वर्ष २०२४ में कुल ७५ परियोजनाओं को कोल इंडिया लिमिटेड के कार्यदेश के अनुसार उपग्रह डाटा के आधार पर भूमि पुनरुद्धार की निगरानी हेतु चुना गया।
- ७५ खुली खदानें जिनका वर्ष २०२४ के उपग्रह डाटा के आधार पर भूमि पुनरुद्धार की निगरानी हेतु चयनित किया गया है उनका कुल पट्टा क्षेत्र ८८३.३७ वर्ग किलोमीटर है तथा उत्खनन क्षेत्र ३४१.५१ वर्ग किलोमीटर है। जिसमें ४६.५० वर्ग किलोमीटर (१३.६२ %) क्षेत्र में जैविक पुनरुद्धार किया गया है, १५२.६७ वर्ग किलोमीटर (४४.७० %) क्षेत्र में तकनीकी पुनरुद्धार कार्य प्रगति पर है तथा शेष १४२.३४ वर्ग किलोमीटर (४१.६८ %) क्षेत्र सक्रिय खनन के अंतर्गत आता है। उपग्रह डाटा के विश्लेषण से स्पष्ट है कि ७५ खुली खदानों के कुल उत्खनन क्षेत्र ३४१.५१ वर्ग किलोमीटर के १९९.१७ वर्ग किलोमीटर (५८.३२ %) क्षेत्र में कुल भूमि पुनरुद्धार का कार्य किया गया है। परियोजनानुसार विवरण तालिका-१.१ और लेखा -१.१ में प्रदर्शित किया गया है।
- वर्ष २०२४-२५ में विभिन्न कोयला कंपनियों के चयनित ७५ खुली खदानों का भूमि पुनरुद्धार के तुलनात्मक विश्लेषण वर्ष २०२३-२४ के सापेक्ष में करने पर पता चलता कि भूमि पुनरुद्धार का क्षेत्र वर्ष २०२३-२४ के १८६.८८ वर्ग किलोमीटर की तुलना में वर्ष २०२४-२५ में बढ़कर १९९.१७ वर्ग किलोमीटर हो गया है। कुल भूमि पुनरुद्धार में जैविक और तकनीकी पुनरुद्धार दोनों ही शामिल है। वर्ष २०२४-२५ में कुल भूमि पुनरुद्धार में १२.२९ वर्ग किलोमीटर की यह वृद्धि पर्यावरण संरक्षण की दिशा में कोल इंडिया के विभिन्न सहायक कंपनियों द्वारा पर्यावरण संरक्षण की दिशा में किए गए सतत प्रयास का परिणाम है। जिनका परियोजनानुसार विवरण लेखा -१.२ में दर्शाया गया है।

- यह देखा गया है कि कोल इंडिया के प्रायः सभी सहायक कंपनियों के उत्खनन क्षेत्र में तकनीकी पुनरुद्धार के बढ़ते हुए रुझान का पता चलता है। वर्ष २०२३ और वर्ष २०२४ के उपग्रह डाटा के तुलनात्मक विश्लेषण से यह पता चलता है कि वर्ष २०२४ में तकनीकी पुनरुद्धार के क्षेत्र में कुल समग्र वृद्धि १०.८५ वर्ग किलोमीटर का आकलन किया गया है।
 - वर्ष २०२४ के उपग्रह डाटा के विश्लेषण से यह पता चलता है कि वर्ष २०२४-२५ में डब्लूसीएल, एसईसीएल, एमसीएल, एनसीएल, ई.सी.एल. और वर्ष २०२३-२४ की तुलना में जैविक पुनरुद्धार के अंतर्गत क्षेत्र में वृद्धि पाई गई। सीसीएल में जैविक पुनरुद्धार के अंतर्गत क्षेत्र में थोड़ी कमी पाई गई, जो कि तालिका-१.१ से पूर्णतः स्पष्ट हो जाता है।
 - यह भी पाया गया है कि कोल इंडिया की सहायक कंपनियाँ डब्लूसीएल, एनसीएल, एसईसीएल और ईसीएल के पट्टाक्षेत्र में कुल वृक्षारोपण (हरित क्षेत्र) जिसमें बैकफील, अधिभार डंपिंग क्षेत्र में वृक्षारोपण तथा सामाजिक वानिकी के अंतर्गत वृक्षारोपण सम्महित है इनमें वृद्धि दर्ज किया गया है। जबकि सीसीएल और एमसीएल के कुल हरित क्षेत्र में थोड़ी कमी का मुख्य कारण अधिभार का हरित क्षेत्र पर डालना या डम्पिंग, नए रोड बनना इत्यादि हो सकता है। विश्लेषण के अनुसार २०२४-२५ में कोल इंडिया के सभी सहायक कोयला कंपनियों के तहत आनेवाले परियोजनाओं के कुल पट्टाक्षेत्र में १८.२२ प्रतिशत हरित क्षेत्र (कुल वृक्षा रोपण) के अंतर्गत पाया गया है।
 - वर्ष २०२४ के उपग्रह डाटा के विश्लेषण से यह पता चलता है कि कोल इंडिया के प्रायः सभी सहायक कंपनियों के भूमि पुनरुद्धार में बढ़ोतरी हुई है। वर्ष २०२४-२५ में विभिन्न कोयला कंपनियों के चयनित ७५ खुली खदानों का भूमि पुनरुद्धार के तुलनात्मक विश्लेषण वर्ष २०२३-२४ से करने पर पता चलता कि भूमि पुनरुद्धार का क्षेत्र वर्ष २०२३ के १८६.८८ (५९.२८ %) वर्ग किलोमीटर की तुलना में वर्ष २०२४ में बढ़कर १९९.१७ (५८.३२ %) वर्ग किलोमीटर हो गया।
- वर्ष २०२४ के उपग्रह डाटा के आधार पर चयनित खुली खदानों के वार्षिक निगरानी से संबन्धित विश्लेषण, पाई चार्ट के माध्यम से चार्ट – १.१ में दर्शाया गया है। २०२४ में कोल इंडिया की सहायक कंपनियों में भूमि पुनरुद्धार की स्थिति बार चार्ट के द्वारा चार्ट – १.२ में दर्शाया गया है। २०२२ से २०२४ के वर्षों में भूमि पुनरुद्धार और हरित क्षेत्र की स्थिति को बार चार्ट के द्वारा क्रमशः चार्ट – १.३ और चार्ट – १.४ में दर्शाया गया है।

Executive Summary

1.0 Project

Land restoration / reclamation monitoring of 75 opencast coal mines in different subsidiaries of Coal India Ltd. (CIL) producing 5 million cu.m. and more (Coal+OB) per annum based on satellite data on annual basis.

2.0 Objective

Objective of the land restoration / reclamation monitoring is to assess the area under backfilling, plantation, social forestry, active mining area, water bodies, distribution of wasteland, agricultural land and forest in the leasehold area of the projects. This will help in assessing the progressive status of mined land reclamation and to take up remedial measures, if any, required for environmental protection.

3.0 Salient Findings

- In the year 2024, amongst projects of different subsidiaries of Coal India Ltd. taken up 75 opencast mines for monitoring.
- Out of the total mine leasehold area of 883.6.37 Km² of the 75 OC projects considered for monitoring during 2024-25; total excavated area is 341.51 Km²; out of which 152.67 Km² area (44.70%) is under backfilling (Technical Reclamation), 46.50 Km² area (13.62%) has been planted (Biologically Reclaimed) and 142.34 Km² area (41.68%) is under active mining. It is evident from the analysis that 199.17 Km² (58.32%) area out of the total excavated area of 341.51 Km² of the 75 OC projects is already under reclamation and balance 142.34 Km² (41.68%) area is under active mining. Company wise details are given in Table – 1.1 & Chart-1.2.
- On comparing the status of land reclamation carried out in year 2023-24 with respect to year 2024-25 in the 75 Opencast projects of different CIL subsidiaries, it is evident from the analysis that area under land reclamation has increased from 186.88 Km² (Yr. 2023-24) to 199.17 Km² (Yr. 2024-25), which includes both area under plantation (Biological Reclamation) and areas under backfilling (Technical Reclamation). This increase of 12.29 Km² area of land reclamation in last one year is the result of the efforts made by CIL's subsidiary companies towards land reclamation. Year wise comparison in land reclamation in different subsidiaries is given in Chart 1.2.
- It has been observed that in all the subsidiaries of Coal India Limited (CIL), technical reclamation has shown an increasing trend. As compared to the analysis done in the year 2023, it has been found that there has been an overall increase of 10.85 Km² in area under technical reclamation commutatively in the year 2024.

- It has been observed that in WCL, SECL, MCL, ECL & NCL area under biological reclamation has increased in comparison to previous year. In CCL biological reclamation has marginally reduced. (Refer Table-1.1).

- In has been also observed that in subsidiaries like WCL, NCL, SECL & ECL, total area under plantation (Green Cover) which includes plantation over backfill, plantation over overburden dumps and plantation done under social forestry etc. has increased as compared to previous year.

However, in CCL and MCL, there has been marginal decrease in area under green cover due to fresh dumping activities, construction of roads and mine advancement in some projects. All these factors have contributed for decrease in Green Cover in SECL and MCL projects.

Overall, 18.22% of the total leasehold area of all the subsidiaries of CIL commutatively is under Green Cover as per the analysis of satellite data of the year 2024.

- Analysis of the results based on satellite data of the year 2024 also indicate that all subsidiaries of CIL, whose projects were under monitoring indicate an increasing trend for area under reclamation. It has been observed that total area under reclamation has increased from 186.88 Km² (59.28%) in 2023 to 199.17 Km² (58.32%) in the year 2024.

Commutative Status of Land Reclamation monitoring based on satellite data of the year 2024 is indicated in the Pie Chart in the Chart 1.1. Subsidiary wise status of Land Reclamation Monitoring of the projects monitored based on satellite data of the year 2024 is shown in form of Bar Chart at Chart-1.2. Comparison of Area under Reclamation and Green Cover in different subsidiaries of Coal India Limited between the years 2022 to 2024 has been shown in form of Bar- Chart in Chart-1.3 & 1.4.

It is noted that maps/plates are prepared based on WGS84 Datum and **Coal Grid** Values are projected for reference (as mentioned in Work order). **Coal grid** are marked in red color.

Table 1.1: Status of Land Reclamation in different Subsidiary

Sl. No.	Project (Nos.)	Total Leasehold Area		Reclamation Activities under Progress								Area under Active Mining		Total Excavated Area		Total Area under		Total Area under	
				Technical		Biological		Other Plantations								Plantation			
				Area under Backfilling		Plantation on Backfilled Areas		Plantation on External OB Dumps		Social Forestry, Avaneue Plantation Etc.						(% Green Cover Generated in Leasehold)			
1	2	3		4		5		6		7		8		9 (=4+5+8)		10 (=5+6+7)		11(=4+5)	
		2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024
1	WCL (26)	234.96	242.73	17.95	19.24	5.27	6.08	22.37	25.57	14.11	15.61	34.40	40.67	57.62	65.99	41.75	47.26	23.22	25.32
				31.15%	29.16%	9.15%	9.21%					59.70%	61.63%			17.77%	19.47%	40.30%	38.37%
2	SECL (18)	187.55	207.83	34.96	37.88	12.23	12.44	9.37	8.55	9.50	11.92	23.16	26.73	70.35	77.05	31.10	32.91	47.19	50.32
				49.69%	49.16%	17.38%	16.15%					32.92%	34.69%			16.58%	15.84%	67.08%	65.31%
3	NCL (10)	184.18	184.18	38.20	40.92	14.43	14.67	20.17	20.25	21.64	22.11	32.22	32.42	84.85	88.01	56.24	57.03	52.63	55.59
				45.02%	46.49%	17.01%	16.67%					37.97%	36.84%			30.54%	30.96%	62.03%	63.16%
4	MCL (13)	158.00	163.14	33.25	35.06	8.19	8.22	3.28	3.24	3.24	3.15	27.74	29.25	69.18	72.53	14.71	14.61	41.44	43.28
				48.06%	48.34%	11.84%	11.33%					40.10%	40.33%			9.31%	8.96%	59.90%	59.67%
5	CCL (06)	44.80	44.80	7.05	7.81	1.91	1.78	0.45	0.36	0.20	0.17	5.67	6.10	14.63	15.69	2.56	2.31	8.96	9.59
				48.19%	49.78%	13.06%	11.34%					38.76%	38.88%			5.71%	5.16%	61.24%	61.12%
6	ECL (02)	40.69	40.69	10.41	11.76	3.03	3.31	1.02	1.11	1.62	2.40	5.18	7.17	18.62	22.24	5.67	6.82	13.44	15.07
				55.91%	52.88%	16.27%	14.88%					27.82%	32.24%			13.93%	16.76%	72.18%	67.76%
	TOTAL (75)	850.18	883.37	141.82	152.67	45.06	46.50	56.66	59.08	50.31	55.36	128.37	142.34	315.25	341.51	152.03	160.94	186.88	199.17
				44.99%	44.70%	14.29%	13.62%					40.72%	41.68%			17.88%	18.22%	59.28%	58.32%

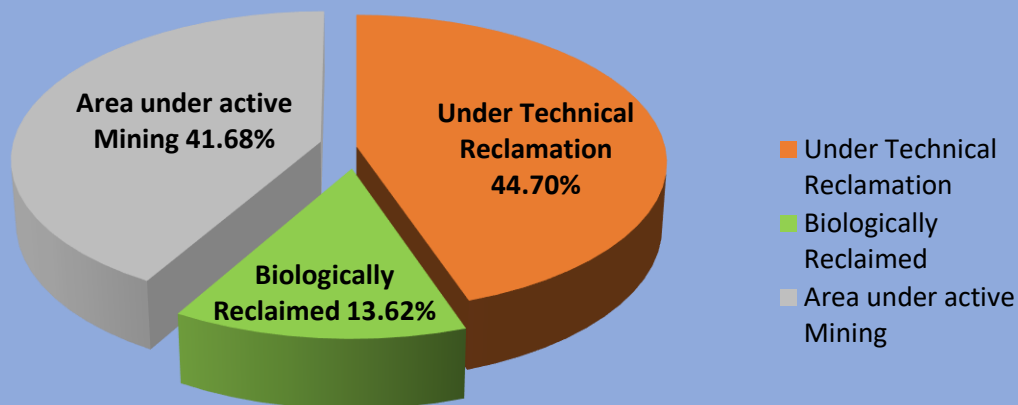
(% is calculated with respected to Excavated Area as applicable)

Note: In reference of the above Table, different parameters are classified as follows:

1. Area under Biological Reclamation includes areas under plantation done on backfilled area only.
2. Area under Technical Reclamation includes area under barren backfilled only
3. Area under Active mining includes coal quarry site, quarry filled with water etc.
4. Social Forestry and Plantation on external OB dump are not included in Biological Reclamation and are put under separate categories as shown in the table.
5. (%) calculated in the above table is in respect of total excavated area except for "Total area under plantation" where (%) is calculated in terms of leasehold area.

STATUS OF LAND RECLAMATION IN THE LEASEHOLD OF 75 OPENCAST MINES UNDER MONITORING IN 2024-25

(Pie Chart indicated distribution of Total Excavated Area Only)



(As per Digital Image Processing of Satellite Data of the year 2024)

Chart 1.1: Pie Chart Showing Status of Land Reclamation

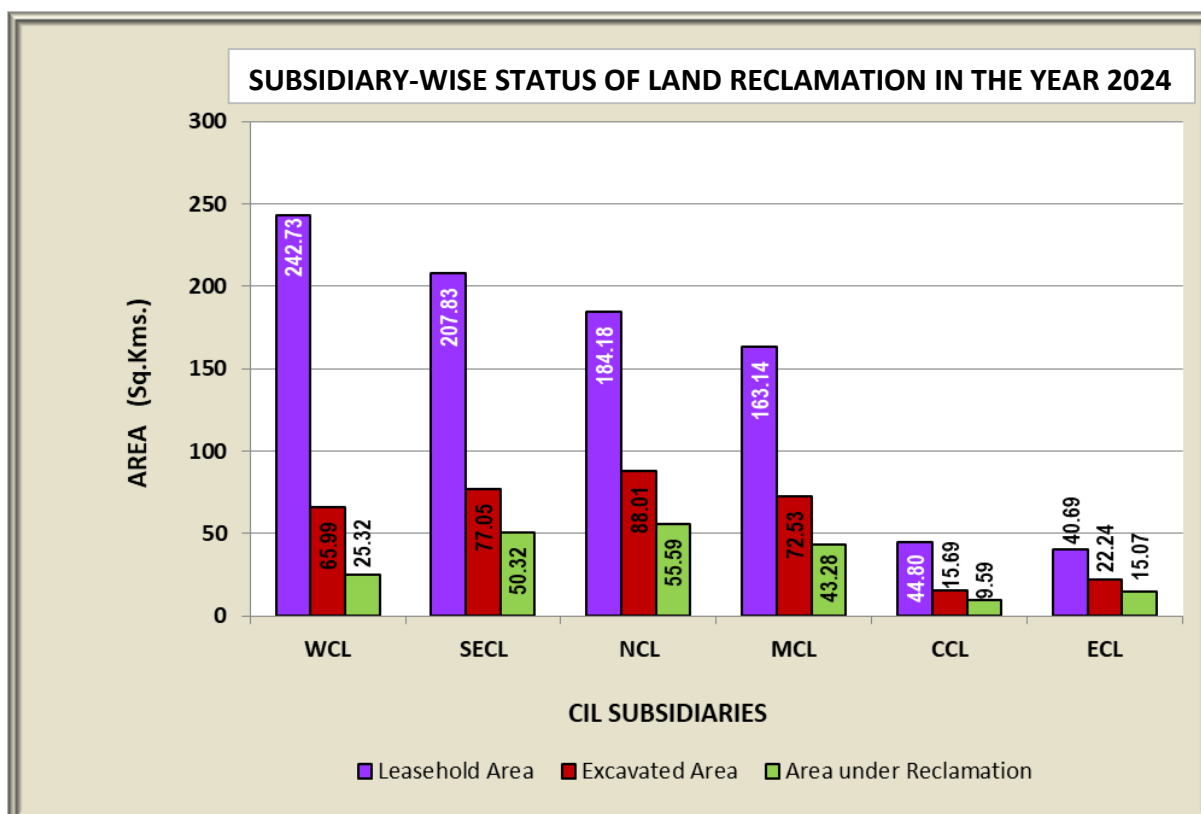


Chart 1.2: Company Wise Land Reclamation Status in the Year 2024

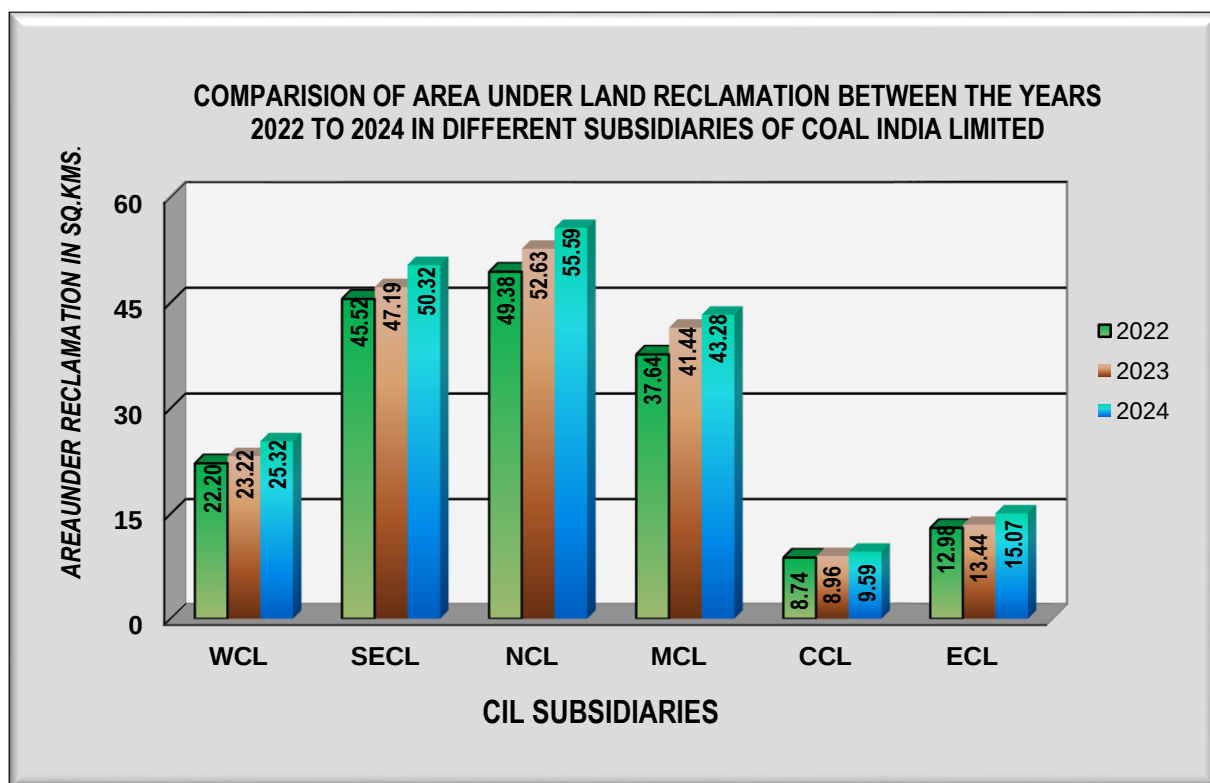


Chart 1.3: Comparison for Area under Land Reclamation between 2022 to 2024

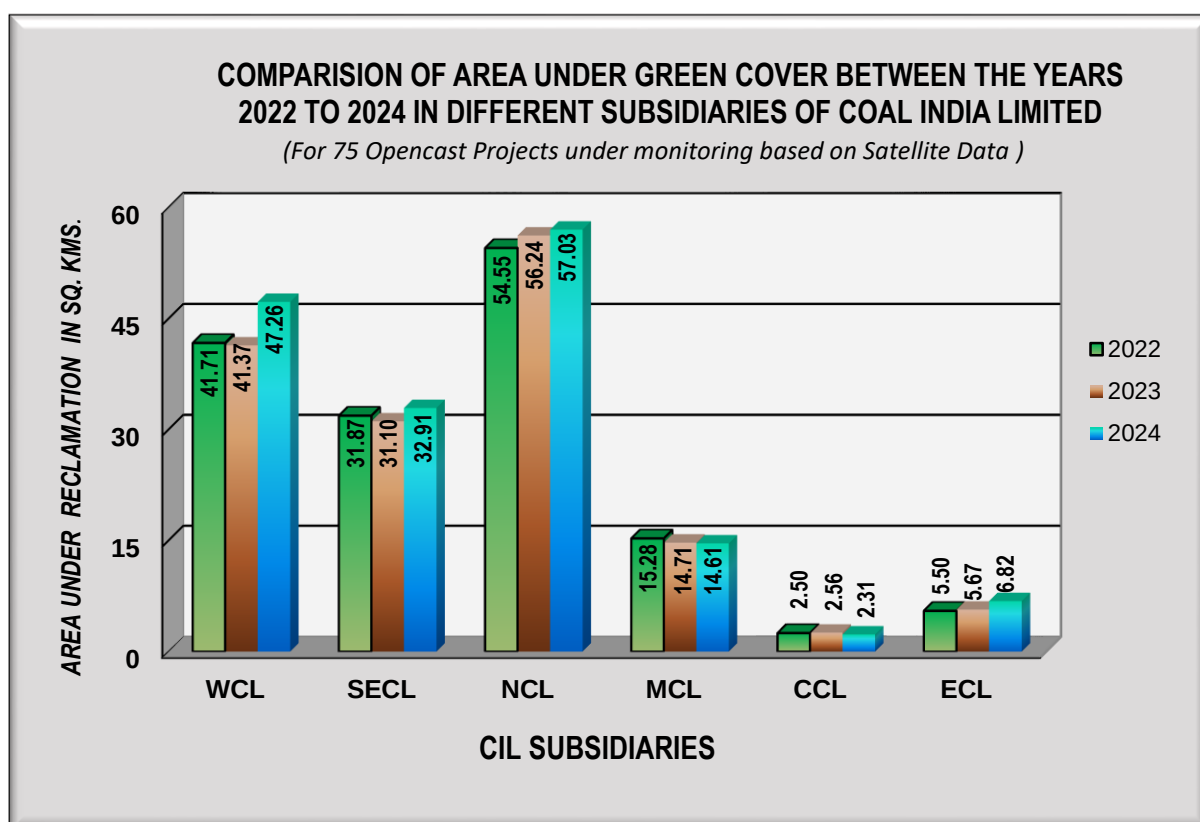


Chart 1.4: Comparison for Area under Green Cover in subsidiaries between 2022 to 2024

1. Background

1.1 Land is the most important natural resource which embodies soil, water, flora, fauna and total ecosystem. All human activities are based on the land which is the scarcest natural resource in our country. Mining is a site-specific industry and it could not be shifted anywhere else from the location where mineral occurs. It is a fact that surface mining activities do effect the land environment due to ground breaking. Therefore, there is an urgent need to reclaim and restore the mined out land for its productive use for sustainable development of mining. This will not only mitigate environmental degradation, but would also help in creating a more congenial environment for land acquisition by coal companies in future.

Keeping above in view, Coal India Ltd. (CIL) issued a work order vide letter no. CIL/WBP/Env/2009/2428 dated 29.12.2009 to Central Mine Planning & Design Institute (CMPDI), Ranchi, for monitoring land reclamation. status of all the opencast coal mines having production of more than 5 million m³ per annum (coal + OB taken together per annum) based on remote sensing satellite data, regularly on annual basis for sustainable development of mining. Further the Job has been extended for two successive periods till year 2024. Presently Coal India Ltd. (CIL) issued a work order vide letter no. vide their letter No CIL/ENV/11463 dated 03.07.2024 for the period 2024-25, 2025-26 & 2026-27 for land reclamation monitoring of opencast projects and vegetation cover monitoring of 19 major coalfields. According to this work order, all mines in CIL with output capacity of 5 million cu. m (coal +OB) shall be monitored every year and all mines below this capacity shall be monitored at an interval of 3 years. All coalfields in CIL shall also be monitored at an interval of 3 years as per a defined plan. The result of land reclamation status of all such mines to be put on the website of CIL (www.coalindia.in), CMPDI (www.cmpdi.co.in) and the concerned coal companies in public domain. Detail report to be submitted to Coal India and respective subsidiaries.

1.2 Land reclamation monitoring of all opencast coal mining projects would also comply the statutory requirements of Ministry of Environment, Forest & Climate Change (MoEF & CC), GoI (Government of India). Such monitoring would not only facilitate in taking timely mitigation measures against environmental degradation but would also enable coal

companies to utilize the reclaimed land for larger socio-economic benefits in a planned way.

- 1.3** CMPDI undertook the above study and the present report is embodying the findings in nutshell carrying out for the 75 opencast projects of different subsidiaries producing 5 million cubic m. Coal +OB or more in the year 2024-25. This study is being carried out in since year 2008 on annual basis and progressive changes in the status of land reclamation have been assessed.

2. Objective

Objective of the land reclamation/restoration monitoring is to assess the area of backfilled, plantation, OB dumps, social forestry, active mining area, settlements, water bodies, distribution of wasteland, agricultural land and forest land in the leasehold area of the project. This is an important step taken up for assessing the progressive status of mined land reclamation and for taking up remedial measures, if any, required for environmental protection.

3. Methodology

There are number of steps involved between raw satellite data procurement and preparation of final map. National Remote Sensing Centre (NRSC) Hyderabad, being the nodal agency for satellite data supply in India, provides only raw digital satellite data, which needs further digital image processing for extracting the information and map preparation before uploading the same in the website. Methodology for land reclamation monitoring is given in fig 1. Following steps are involved in land reclamation /restoration monitoring:

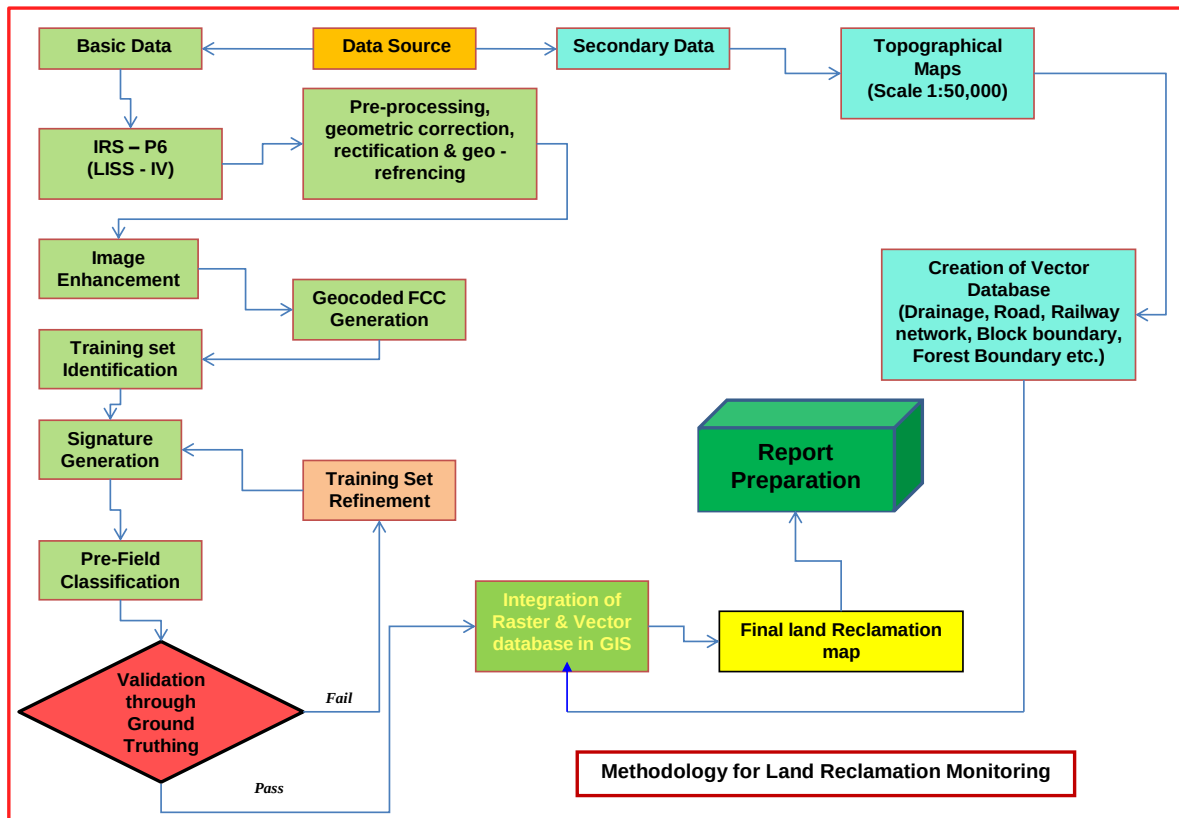


Figure 3.1: Methodology for Land Reclamation Monitoring

3.1 Data Procurement

After browsing the data quality and date of pass on internet, supply order for data is placed to NRSC. Secondary data like leasehold boundary, topo sheets are procured for creation of vector database.

3.2 Satellite Data Processing

Satellite data are processed using ERDAS IMAGINE v 2022 digital image processing s/w. Methodology involves the following major steps:

- Rectification & Geo-referencing:** Inaccuracies in digital imagery may occur due to 'systematic errors' attributed to earth curvature and rotation as well as 'non-systematic errors' attributed to satellite receiving station itself. Raw digital images contain geometric distortions, which make them unusable as maps. Therefore, geo-referencing is required for correction of image data using ground control points (GCP) to make it compatible to Sol (Survey of India) Topo-sheet.

- **Image enhancement:**

To improve the interpretability of the raw data, image enhancement is necessary. Local operations modify the value of each pixel based on brightness value of neighbouring pixels using ERDAS IMAGINE v 2022 digital image processing s/w and enhance the image quality for proper interpretation.

- **Training set selection**

Training set requires to be selected, so that software can classify the image data accurately. The image data are analysed based on the interpretation keys. These keys are evolved from certain fundamental image-elements such as tone/colour, size, shape, texture, pattern, location, association and shadow. Based on the image-elements and other geo-technical elements like land form, drainage pattern and physiography; training sets were selected/identified for each land use/cover class. Field survey was carried out by taking selective traverses in order to collect the ground information (or reference data) so that training sets are selected accurately in the image. This was intended to serve as an aid for classification.

- **Classification and Accuracy assessment**

Image classification is carried out using the maximum likelihood algorithm. The classification proceeds through the following steps: (a) calculation of statistics [i.e. signature generation] for the identified training areas, and (b) the decision boundary of maximum probability based on the mean vector, variance, covariance and correlation matrix of the pixels. After evaluating the statistical parameters of the training sets, reliability test of training sets is conducted by measuring the statistical separation between the classes that resulted from computing divergence matrix. The overall accuracy of the classification was finally assessed with reference to ground truth data.

- **Area calculation**

The area of each land use class in the leasehold is determined using ERDAS IMAGINE v 2022 digital image processing s/w.

- **Overlay of Vector data base**

Vector data base created based on secondary data. Vector layer like drainage, railway line, leasehold boundary, forest boundary etc. are superimposed on the image as vector layer in the Arc GIS database.

- **Pre-field map preparation**

Pre-field map is prepared for validation of the classification results.

3.3 Ground Truthing:

Selective ground verification of the land use classes are carried out in the field and necessary corrections if required, are incorporated before map finalization.

3.4 Land reclamation database on GIS:

Land reclamation database is created on GIS platform to identify the temporal changes identified from satellite data of different cut-off dates.

4. Work Plan

4.1 Total 75 opencast projects producing 5 million cubic m. and more (Coal + OB together) during the year 2024-25 were taken up for the study. Based on the *RESOURCESAT-2* satellite data, land reclamation / mine closure monitoring was carried out using ERDAS IMAGINE digital image processing s/w and Arc-Info GIS. Baseline data on reclamation of these OC projects of CIL's subsidiaries have been generated and the same has been annually updated since year 2008.

4.2 Besides project wise land reclamation monitoring, coalfield wise vegetation cover monitoring on regional scale has also been planned for the major 13 coalfields of India at regular interval of three years using remote sensing satellite data to assess the regional impact of coal mining and associated industrialization on the land use and vegetation cover in the coalfield. Geo-environmental baseline data for Raniganj, Jharia, East Bokaro, West Bokaro, Karanpura, Singrauli (Moher Sub-basin), Korba, Bishrampur, Sohagpur, Mand-Raigarh, Talcher, Ib Valley, Wardha Valley, Bander, Kamptee, Umrer, Pench Kanhan and Makum

coalfields based on the satellite data have been generated and will be monitored regularly at three years' interval.

4.3 The list of subsidiary wise 75 opencast projects taken up for Land Reclamation Monitoring based on satellite data of year 2024 is given in table below:

Subsidiary <i>(No. of Projects)</i>	Opencast Projects <i>(5 million Cu.m. Coal +OB or more per annum)</i>
WCL (26)	Sasti, Durgapur, Mugoli, Umrer, Ukni, Niljai, New Majri, MKD- III, Penganga, Yekona-I &II (Amal.), New Majri UG to OC, Pauni-II (Expn.), MKD-I (Expn.), Bhatadi, Bellora Naigaon, Ballarpur, Junad, Kolarpimpiri, HLOCM, Gauri Pauni, Gondegaon, Adasa UG to OC, Bhanegaon, Gokul, Inder Kamptee Amal, Dhoptala
SECL (18)	Dipka, Gevra, Kusmunda, Manikpur, Saraipalli, Amlai Sector B, Jampali, Baroud, Bijari, Chhal, Rajnagar, Chirimiri, Kanchan, Jagannathpur, Amadand, Batura, Amera & Amgaon
NCL (10)	Amlohri, Nigahi, Jayant, Dudhichua, Khadia, Krishnashila, Bina, Kakri, Jhingurdah, Block-B
MCL (13)	Ananta, Balram, Lingraj, Bharatpur, Bhubaneswari, Jagannath, Hingula, Kaniha, Integrated Lakhanpur-Belpahar-Lilari, Samleswari, Lajkura, Garjanbahal & Kulda
CCL (06)	Ashok, North Urimari, Magadh, Amrapali, Tapin North, Konar Expansion
ECL (02)	Sonepur Bazari, Rajmahal
TOTAL (75)	

WESTERN COALFIELDS LIMITED

5. Land Reclamation Status in Western Coalfields Ltd.

5.1 Following 26 OC projects producing more than 5 million cubic m. (Coal + OB together) of Western Coalfields Ltd. have been taken up for land reclamation monitoring based on Satellite Data of the year 2024:

- | | |
|-----------------------|----------------------|
| ▪ Sasti | ▪ Bhatadi |
| ▪ Durgapur | ▪ Bellora Naigaon |
| ▪ Mugoli | ▪ Ballarpur |
| ▪ Umrer | ▪ Junad |
| ▪ Ukni | ▪ Kolarpimpri |
| ▪ Niljai | ▪ HLOCM |
| ▪ New Majri | ▪ Gauri Pauni |
| ▪ MKD-III | ▪ Gondegaon |
| ▪ Penganga | ▪ Adasa UG to OC |
| ▪ Yekona-I&II (Amal.) | ▪ Bhanegaon |
| ▪ New Majri UG to OC | ▪ Gokul |
| ▪ Pauni-II (Expn.) | ▪ Inder Kamptee Amal |
| ▪ MKD-I(Expn.) | ▪ Dhoptala |

5.2 Project wise Land Reclamation status in WCL for the year 2024 is given in Table 5.1 and also shown graphically in Chart- 5.1. Area statistics of different land use class present in the mine leasehold boundaries of the above projects for the year 2024 are shown in the Table - 5.2. Land use maps derived from satellite data are shown in Plate 5.1-5.26. Year wise changes in the different land use classes based on satellite data are depicted in Bar Charts in Chart- 5.2 - 5.27 for the last three years only. (except Dhoptala).

5.3 Study reveals that 25.32 Km² (38.37%) of excavated area has been under reclamation in the above-mentioned mines of WCL out of which 6.08 Km²(9.21%) area has been revegetated and 19.24 Km² (29.16%) area is under backfilling. There is an overall increase of 2.10 Km² in area under reclamation in WCL in the year 2024 with respect to the year 2023, out of which there is an increase of 1.29 Km² in area under technical reclamation

(Barren Backfilling) and an increase of 0.81 Km² in area under biological reclamation (Plantation on Backfilled Areas) (Refer Table-1).

In Sasti OC project, plantation on OB has been reduced by 0.11 Km² on account of tree felling and rehandling of backfill for the purpose of coal mining. In Durgapur OC and Umrer OC projects backfill has been reduced by 0.08 Km² and 0.04 Km² respectively as backfill has been converted to biological reclamation. In Inder Kamptee Amalgamated OC project total lease hold area have been decreased from 11.25 Km² to 7.95 Km². In previous cycle Inder OC project and Kamptee OC project had been analyzed separately in different year

5.4 Analysis of satellite data also indicates that total area under active mining has increased from 34.40 Km² (Yr.2023) to 40.67 Km² (Yr.2024). In Umrer OC project area under active mining has reduced due to increase in area under backfilling.

5.5 After comparing the satellite data of year 2024 vs. 2023, study also reveals that area under backfilling has increased from 17.95 Km² (Yr.2023) to 19.24 Km² (Yr.2024).

5.6 Total area under biological reclamation has increased from 5.27 Km² (Yr.2023) to 6.08 Km² (Yr.2023). There is no biological reclamation in Yekona-I&II (Amal.), New Majri UG to OC, Pauni-II (Expn.), MKD-I and MKD-III OC, Gondegaon, Adasa UG to OC, Bhanegaon, Gokul, Dhoptala & Penganga OC.

5.7 Analysis of satellite data also indicates that total area under plantation (Green Cover) has increased from 41.75 Km² (Yr.2023) to 47.26 Km² (Yr.2024). The increase of 5.51 Km² area under Green Cover areas may be attributed to continuous effort of WCL towards environmental protection.

5.8 After comparing the satellite data of year 2024 vs. 2023, it is evident that total area under plantation (Green Cover) in all 26 Opencast Projects has increased. It has been also observed in some of the projects natural vegetation has also started growing on stabilized old backfilled areas and overburden dumps due to high soil fertility.

5.9 On comparing the status of land reclamation for the year 2024 with respect to the year 2023 in different projects, it is evident that the total area under reclamation has increased from 23.22 Km² (Yr. 2023) to 25.32 Km² (Yr. 2024).

5.10 Out of 26 projects of WCL, maximum area under reclamation is in Ballarpur Opencast Project (85.95%) followed by Sasti OC (80.73%) and Umrer OC (66.25%).

Table 5.1: Summarized Land Reclamation Status in WCL
Summarized Land Reclamation Status in Opencast Projects of NCL based on Satellite Data of the year 2024

(Area in Sq. Kms.)																			
Sl. No.	Project	Total Leasehold Area		Technical Reclamation		Plantation						Area under Active Mining		Total Excavated Area		Total Area under Plantation (% Green Cover Generated in Leasehold)		Total Area under Reclamation	
						Biological Reclamation		Other Plantations											
				Area under Backfilling		Plantation on Excavated / Backfilled Area		Plantation on External Over Burden Dumps		Social Forestry, Avaneue Plantation Etc.									
1	2	3		4		5		6		7		8		9 (=4+5+8)		10 (=5+6+7)		11(=4+5)	
		2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024
1	Sasti	9.20	11.12	2.72	2.90	0.73	0.62	1.68	1.92	0.68	0.71	0.50	0.84	3.95	4.36	3.09	3.25	3.45	3.52
				68.86%	66.51%	18.48%	14.22%					12.66%	19.27%			33.59%	29.23%	87.34%	80.73%
2	Durgapur	15.50	15.50	1.04	0.96	1.06	1.18	2.81	2.99	1.19	1.26	2.57	2.75	4.67	4.89	5.06	5.43	2.10	2.14
				22.27%	19.63%	22.70%	24.13%					55.03%	56.24%			32.65%	35.03%	44.97%	43.76%
3	Mugoli	12.55	12.55	1.53	1.70	0.17	0.2	1.9	1.98	0.61	0.65	1.95	2.23	3.65	4.13	2.68	2.83	1.70	1.90
				41.92%	41.16%	4.66%	4.84%					53.42%	54.00%			21.35%	22.55%	46.58%	46.00%
4	Umrer	9.45	9.45	1.51	1.47	1.63	1.73	1.45	1.45	2.32	2.32	1.69	1.63	4.83	4.83	5.40	5.50	3.14	3.20
				31.26%	30.43%	33.75%	35.82%					34.99%	33.75%			57.14%	58.20%	65.01%	66.25%
5	Ukni	12.85	12.85	0.54	0.65	0.00	0.00	1.74	1.81	0.86	0.98	2.15	2.15	2.69	2.80	2.60	2.79	0.54	0.65
				20.07%	23.21%	0.00%	0.00%					79.93%	76.79%			20.23%	21.71%	20.07%	23.21%
6	Niljai	17.61	17.61	1.46	1.75	0.13	0.13	2.11	2.23	1.25	1.31	2.99	3.09	4.58	4.97	3.49	3.67	1.59	1.88
				31.88%	35.21%	2.84%	2.62%					65.28%	62.17%			19.82%	20.84%	34.72%	37.83%
7	New Majri	7.74	7.74	1.64	1.82	0.24	0.28	0.97	1.04	1.47	1.47	2.22	2.27	4.10	4.37	2.68	2.79	1.88	2.10
				40.00%	41.65%	5.85%	6.41%					54.15%	51.95%			34.63%	36.05%	45.85%	48.05%
8	MKD-III	9.23	9.23	0.41	0.46	0.00	0.00	0.00	0.25	0.12	0.17	1.09	1.55	1.50	2.01	0.12	0.42	0.41	0.46
				27.33%	22.89%	0.00%	0.00%					72.67%	77.11%			1.30%	4.55%	27.33%	22.89%
9	Penganga	7.63	7.63	0.75	0.84	0.00	0.00	0.49	0.50	0.55	0.68	1.25	1.42	2.00	2.26	1.04	1.18	0.75	0.84
				37.50%	37.17%	0.00%	0.00%					62.50%	62.83%			13.63%	15.47%	37.50%	37.17%
10	Yekona-I&II(Amal)	16.79	16.79	0.01	0.20	0.00	0.00	0.00	0.00	0.03	0.08	1.29	1.64	1.30	1.84	0.03	0.08	0.01	0.20
				0.77%	10.87%	0.00%	0.00%					99.23%	89.13%			0.18%	0.48%	0.77%	10.87%
11	New Majri UG to OC	7.06	7.06	0.00	0.00	0.00	0.00	0.27	0.35	0.37	0.46	1.06	1.44	1.06	1.44	0.64	0.81	0.00	0.00
				0.00%	0.00%	0.00%	0.00%					100.00%	100.00%			9.07%	11.47%	0.00%	0.00%
12	Pauni -II (Expn)	10.95	10.95	0.00	0.00	0.00	0.00	0.18	0.25	0.22	0.30	1.34	1.74	1.34	1.74	0.40	0.55	0.00	0.00
				0.00%	0.00%	0.00%	0.00%					100.00%	100.00%			3.65%	5.02%	0.00%	0.00%
13	MKD -1 (Expn) OC	6.14	6.14	0.00	0.00	0.00	0.00	0.10	0.10	0.00	0.00	1.57	1.86	1.57	1.86	0.10	0.10	0.00	0.00
				0.00%	0.00%	0.00%	0.00%					100.00%	100.00%			1.63%	1.63%	0.00%	0.00%
	Total-A	142.70	144.62	11.61	12.75	3.96	4.14	13.70	14.87	9.67	10.39	21.67	24.61	37.24	41.50	27.33	29.40	15.57	16.89
				31.18%	30.72%	10.63%	9.98%					58.19%	59.30%			19.15%	20.33%	41.81%	40.70%

(Area in Sq. Kms.)																			
Sl. No.	Project	Total Leasehold Area		Technical Reclamation		Biological Reclamation		Other Plantations				Area under Active Mining		Total Excavated Area		Total Area under Plantation		Total Area under Reclamation	
				Area under Backfilling		Plantation on Excavated / Backfilled Area		Plantation on External Over Burden Dumps		Social Forestry, Avaneue Plantation Etc.						(% Green Cover Generated in Leasehold)			
1	2	3		4		5		6		7		8		9 (=4+5+8)		10 (=5+6+7)		11(=4+5)	
		2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024
14	Bhatadi	8.47	8.47	0.38	0.44	0.00	0.00	0.50	0.59	0.43	0.48	0.97	1.12	1.35	1.56	0.93	1.07	0.38	0.44
				28.15%	28.21%	0.00%	0.00%					71.85%	71.79%			10.98%	12.63%	28.15%	28.21%
15	Bellora Naigaon	6.65	6.65	0.73	0.83	0.18	0.20	0.48	0.57	0.32	0.45	1.15	1.20	2.06	2.23	0.98	1.22	0.91	1.03
				35.44%	37.22%	8.74%	8.97%					55.83%	53.81%			14.74%	18.35%	44.17%	46.19%
16	Ballarpur	2.43	2.43	0.75	0.76	0.25	0.28	0.73	0.78	0.09	0.13	0.17	0.17	1.17	1.21	1.07	1.19	1.00	1.04
				64.10%	62.81%	21.37%	23.14%					14.53%	14.05%			44.03%	48.97%	85.47%	85.95%
17	Junad	4.50	4.50	0.37	0.41	0.05	0.12	0.75	0.81	0.34	0.38	0.66	0.67	1.08	1.20	1.14	1.31	0.42	0.53
				34.26%	34.17%	4.63%	10.00%					61.11%	55.83%			25.33%	29.11%	38.89%	44.17%
18	Kolarpimpiri	14.89	14.89	0.15	0.21	0.08	0.11	1.35	1.43	0.12	0.16	1.72	1.79	1.95	2.11	1.55	1.70	0.23	0.32
				7.69%	9.95%	4.10%	5.21%					88.21%	84.83%			10.41%	11.42%	11.79%	15.17%
19	HLOCM	3.12	3.12	0.63	0.65	0.06	0.10	0.74	0.76	0.31	0.37	0.48	0.54	1.17	1.29	1.11	1.23	0.69	0.75
				53.85%	50.39%	5.13%	7.75%					41.03%	41.86%			35.58%	39.42%	58.97%	58.14%
20	Gouri pouni	6.77	12.91	0.89	0.91	0.60	0.79	2.06	2.55	0.62	0.64	0.95	1.70	2.44	3.40	3.28	3.98	1.49	1.70
				36.48%	26.76%	24.59%	23.24%					38.93%	50.00%			48.45%	30.83%	61.07%	50.00%
21	Gondegaon	7.91	7.91	0.56	0.62	0.00	0.00	0.96	1.22	0.51	0.57	1.49	1.90	2.05	2.52	1.47	1.79	0.56	0.62
				27.32%	24.60%	0.00%	0.00%					72.68%	75.40%			18.58%	22.63%	27.32%	24.60%
22	Adasa UG to OC	5.64	5.64	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.27	0.57	0.80	0.57	0.80	0.14	0.27	0.00	0.00
				0.00%	0.00%	0.00%	0.00%					100.00%	100.00%			2.48%	4.79%	0.00%	0.00%
23	Bhanegaon	3.48	3.48	0.01	0.02	0.00	0.00	0.16	0.33	0.20	0.24	0.37	0.69	0.38	0.71	0.36	0.57	0.01	0.02
				2.63%	2.82%	0.00%	0.00%					97.37%	97.18%			10.34%	16.38%	2.63%	2.82%
24	Gokul	7.01	10.02	0.75	0.89	0.00	0.00	0.00	0.00	0.30	0.92	1.39	2.12	2.14	3.01	0.30	0.92	0.75	0.89
				35.05%	29.57%	0.00%	0.00%					64.95%	70.43%			4.28%	9.18%	35.05%	29.57%
25	Inder Kamptee Amal	11.25	7.95	1.12	0.75	0.09	0.34	0.76	1.41	0.84	0.31	1.47	1.62	2.68	2.71	1.69	2.06	1.21	1.09
				41.79%	27.68%	3.36%	12.55%					54.85%	59.78%			15.02%	25.91%	45.15%	40.22%
26	Dhoptala	10.14	10.14	0.00	0.00	0.00	0.00	0.18	0.25	0.22	0.30	1.34	1.74	1.34	1.74	0.40	0.55	0.00	0.00
				0.00%	0.00%	0.00%	0.00%					100.00%	100.00%			3.94%	5.42%	0.00%	0.00%
	Total-B	92.26	98.11	6.34	6.49	1.31	1.94	8.67	10.70	4.44	5.22	12.73	16.06	20.38	24.49	14.42	17.86	7.65	8.43
				31.11%	26.50%	6.43%	7.92%					62.46%	65.58%			15.63%	18.20%	37.54%	34.42%
	Total- (A+B)	234.96	242.73	17.95	19.24	5.27	6.08	22.37	25.57	14.11	15.61	34.40	40.67	57.62	65.99	41.75	47.26	23.22	25.32
				31.15%	29.16%	9.15%	9.21%					59.70%	61.63%			17.77%	19.47%	40.30%	38.37%

Note: In reference of the above Table-1, different parameters are classified as follows

- 1 Area under Biological Reclamation includes area under plantation done on backfilled area only.
- 2 Area under Technical Reclamation includes areas under barren backfill only.
- 3 Area under Active Mining includes coal quarry, advance quarry & quarry filled with water etc.
- 4 Social forestry and plantation on external OB dump are not included in biological reclamation and are put under another plantation.
- 5 % calculated in respect to total excavated area except for "Total area under plantation" where % is in terms of leasehold area.

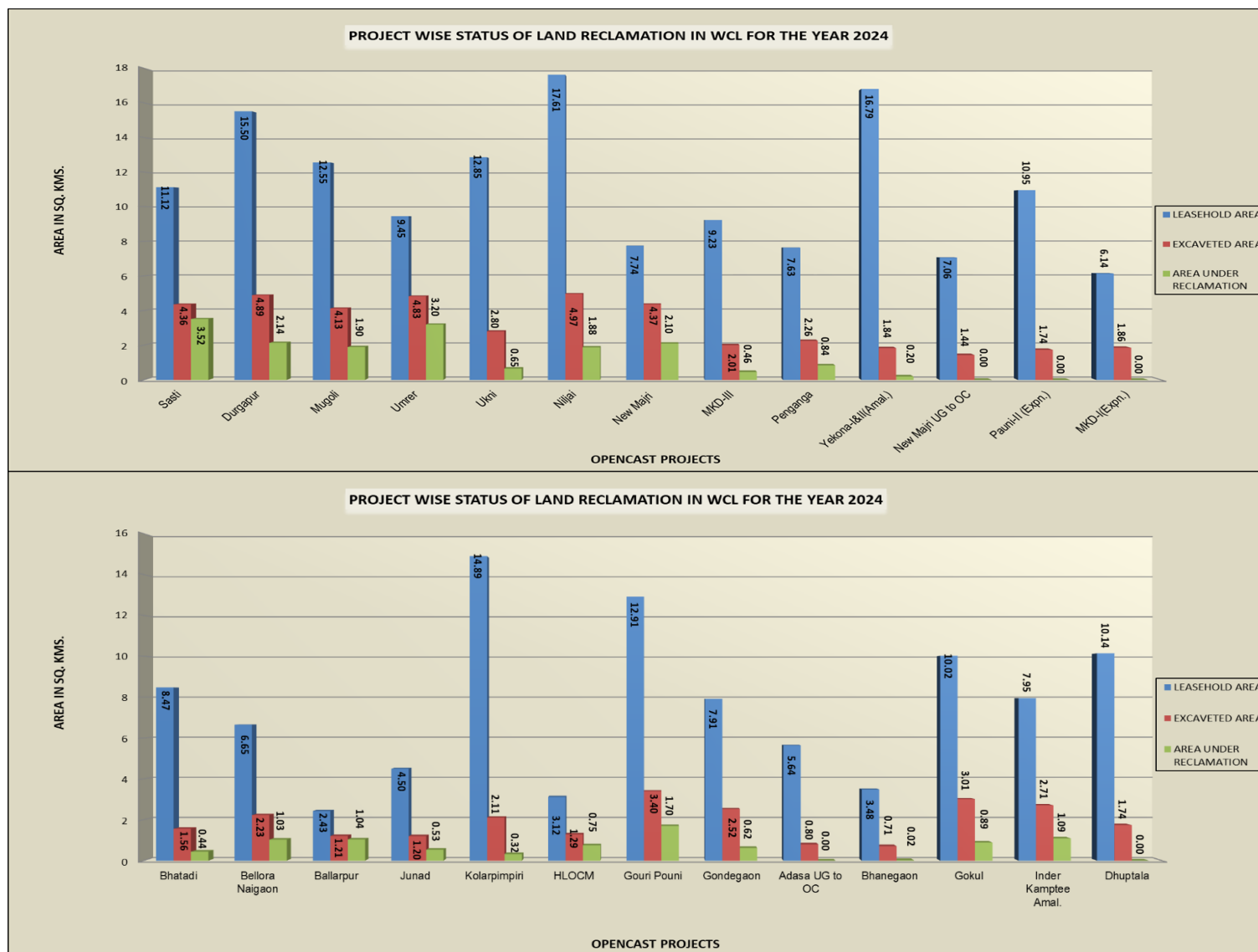


Chart 5.1: Bar Chart showing Land Reclamation Status in WCL

Table 5.2: Project-wise Land Reclamation Status in Opencast Projects of WCL (2024)
PART-A

(Area in Sq.Km)																													
		Sasti		Durgapur		Mungoli		Umrer		Ukni		Niljai		New Majri		MKD-III		Penganga		Yekona-I&II (Amal)		New Majri Ug to OC		Pauni -II (Expn)		MKD-I (Expn.)		Total	
FORESTS		Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
	Dense Forest	0.00	0.00	1.27	8.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	0.88
	Open Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Forest		0.00	0.00	1.27	8.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	0.88
SCRUBS		0.51	5.00	0.48	3.10	1.62	12.91	0.00	0.00	1.53	11.91	1.34	7.61	0.06	0.78	0.54	5.85	0.71	9.31	1.99	11.85	0.68	9.63	0.97	8.86	0.75	12.21	11.18	7.78
	Scrub																												
PLANTATION		0.71	6.95	1.26	8.13	0.65	5.18	2.32	24.55	0.98	7.63	1.31	7.44	1.47	18.99	0.17	1.84	0.68	8.91	0.08	0.48	0.46	6.52	0.30	2.74	0.00	0.00	10.39	7.23
	Social Forestry																												
	Plantation on OB Dump	1.92	18.81	2.99	19.29	1.98	15.78	1.45	15.34	1.81	14.09	2.23	12.66	1.04	13.44	0.25	2.71	0.50	6.55	0.00	0.00	0.35	4.96	0.25	2.28	0.10	1.63	14.87	10.35
	Plantation on Backfill (Biological Reclamation)	0.62	6.07	1.18	7.61	0.20	1.59	1.73	18.31	0.00	0.00	0.13	0.74	0.28	3.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.14	2.88
Total Plantation		3.25	31.83	5.43	35.03	2.83	22.55	5.50	58.20	2.79	21.71	3.67	20.84	2.79	36.05	0.42	4.55	1.18	15.47	0.08	0.48	0.81	11.47	0.55	5.02	0.10	1.63	29.40	20.46
Total Vegetation		3.76	36.83	7.18	46.32	4.45	35.46	5.50	58.20	4.32	33.62	5.01	28.45	2.85	36.82	0.96	10.40	1.89	24.77	2.07	12.33	1.49	21.10	1.52	13.88	0.85	13.84	41.85	29.12
ACTIVE MINING		0.78	7.64	2.25	14.52	2.23	17.77	1.52	16.08	1.99	15.49	3.00	17.04	2.27	29.33	1.55	16.79	1.19	15.60	1.43	8.52	1.31	18.56	1.54	14.06	1.86	30.29	22.92	15.95
	Coal Quarry																												
	Coal Dump	0.06	0.59	0.05	0.32	0.00	0.00	0.10	1.06	0.10	0.78	0.05	0.28	0.00	0.00	0.00	0.00	0.23	3.01	0.21	1.25	0.13	1.84	0.20	1.83	0.00	0.00	1.13	0.79
	Advance Quarry Site	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Quarry Filled With Water	0.00	0.00	0.45	2.90	0.00	0.00	0.01	0.11	0.06	0.47	0.04	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.39
Total Area under Active Mining		0.84	8.23	2.75	17.74	2.23	17.77	1.63	17.25	2.15	16.73	3.09	17.55	2.27	29.33	1.55	16.79	1.42	18.61	1.64	9.77	1.44	20.40	1.74	15.89	1.86	30.29	24.61	17.12
		0.69	6.76	1.77	11.42	2.15	17.13	0.12	1.27	3.73	29.03	4.46	25.33	0.31	4.01	2.55	27.63	1.35	17.69	2.04	12.15	0.84	11.90	3.17	28.95	0.78	12.70	23.96	16.67
	Barren OB Dump																												
	Barren Backfilled Area (Technical Reclamation)	2.90	28.40	0.96	6.19	1.70	13.55	1.47	15.56	0.65	5.06	1.75	9.94	1.82	23.51	0.46	4.98	0.84	11.01	0.03	0.18	0.00	0.00	0.00	0.00	0.00	0.00	12.58	8.75
	Total Area	3.59	35.16	2.73	17.61	3.85	30.68	1.59	16.83	4.38	34.09	6.21	35.26	2.13	27.52	3.01	32.61	2.19	28.70	2.07	12.33	0.84	11.90	3.17	28.95	0.78	12.70	36.54	25.43
Total Area Under Mine Operation		4.43	43.39	5.48	35.35	6.08	48.45	3.22	34.07	6.53	50.82	9.30	52.81	4.40	56.85	4.56	49.40	3.61	47.31	3.71	22.10	2.28	32.29	4.91	44.84	2.64	43.00	61.15	42.55
WASTELANDS		0.53	5.19	1.16	7.48	0.23	1.83	0.27	2.86	0.75	5.84	0.79	4.49	0.10	1.29	0.15	1.63	1.65	21.63	1.26	7.50	0.26	3.68	0.33	3.01	0.11	1.79	7.59	5.28
	Waste Lands																												
	Fly Ash Pond / Sand Body	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.71	0.05	0.46	0.00	0.10	0.07	
Total Wasteland		0.53	5.19	1.16	7.48	0.23	1.83	0.27	2.86	0.75	5.84	0.79	4.49	0.10	1.29	0.15	1.63	1.65	21.63	1.26	7.50	0.31	4.39	0.38	3.47	0.11	1.79	7.69	5.35
WATERBODIES		0.07	0.69	0.05	0.32	0.00	0.00	0.20	2.12	0.00	0.00	0.03	0.17	0.01	0.13	0.00	0.00	0.12	1.57	0.10	0.60	0.03	0.42	0.22	2.01	0.07	1.14	0.90	0.63
	Reservoir, nallah, ponds																												
	Total Waterbodies	0.07	0.69	0.05	0.32	0.00	0.00	0.20	2.12	0.00	0.00	0.03	0.17	0.01	0.13	0.00	0.00	0.12	1.57	0.10	0.60	0.03	0.42	0.22	2.01	0.07	1.14	0.90	0.63
AGRICULTURE		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	10.08	0.00	0.00	3.26	19.42	0.87	12.32	0.46	4.20	0.51	8.31	6.03	4.20
	Crop Lands																												
	Fallow Lands	1.08	10.58	1.04	6.71	1.46	11.63	0.00	0.00	1.05	8.17	1.45	8.23	0.00	0.00	2.42	26.22	0.21	2.75	6.34	37.76	2.00	28.33	3.33	30.41	1.96	31.92	22.34	15.55
Total Agriculture		1.08	10.58	1.04	6.71	1.46	11.63	0.00	0.00	1.05	8.17	1.45	8.23	0.00	0.00	3.35	36.29	0.21	2.75	9.60	57.18	2.87	40.65	3.79	34.61	2.47	40.23	28.37	19.74
SETTLEMENTS		0.08	0.78	0.39	2.52	0.12	0.96	0.15	1.59	0.00	0.00	0.34	1.93	0.34	4.39	0.00	0.00	0.00	0.00	0.01	0.06	0.07	0.99	0.00	0.00	0.00	0.00	1.50	1.04
	Urban Settlement																												
	Rural Settlement	0.00	0.00	0.05	0.32	0.03	0.24	0.00	0.00	0.02	0.16	0.20	1.14	0.00	0.00	0.00	0.00	0.03	0.39	0.03	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.25
	Industrial Settlement	0.26	2.55	0.15	0.97	0.18	1.43	0.11	1.16	0.18	1.40	0.49	2.78	0.04	0.52	0.21	2.28	0.12	1.57	0.01	0.06	0.01	0.14	0.13	1.19	0.00	0.00	1.89	1.32
Total Settlement		0.34	3.33	0.59	3.81	0.33	2.63	0.26	2.75	0.20	1.56	1.03	5.85	0.38	4.91	0.21	2.28	0.15	1.97	0.05	0.30	0.08	1.13	0.13	1.19	0.00	0.00	3.75	2.61
Grand Total		10.21	100.00	15.50	100.00	12.55	100.00	9.45	100.00	12.85	100.00	17.61	100.00	7.74	100.00	9.23	100.00	7.63	100.00	16.79	100.00	7.06	100.00	10.95	100.00	6.14	100.00	143.71	100.00

PART-B

		(Area in Sq.Km)																											
		Bhatadi		Bellora Naigaon		Ballarpur		Junad		Kolar Pimpri		HLOCM		Gauri-Pouni		Gondegaon		Adasa UG to OC		Dhuptala		Gokul		Bhanegaon		Inder Kamptee		Total	
		Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
FORESTS	Dense Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Open Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Forest	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SCRUBS																													
	Scrubs	0.97	11.45	0.53	7.97	0.01	0.41	0.51	11.33	2.40	16.12	0.02	0.64	0.86	6.66	0.33	4.17	0.82	14.54	1.07	10.55	1.06	10.58	0.13	3.74	0.75	12.21	9.46	9.82
PLANTATION	Social Forestry	0.48	5.67	0.45	6.77	0.13	5.35	0.38	8.44	0.16	1.07	0.37	11.86	0.64	4.96	0.57	7.21	0.27	4.79	0.41	4.04	0.92	9.18	0.24	6.90	0.00	0.00	5.02	5.21
	Plantation on OB Dump	0.59	6.97	0.57	8.57	0.78	32.10	0.81	18.00	1.43	9.60	0.76	24.36	2.55	19.75	1.22	15.42	0.00	0.00	0.78	7.69	0.00	0.00	0.33	9.48	0.10	1.63	9.92	10.30
	Plantation on Backfill (Biological Reclamation)	0.00	0.00	0.20	3.01	0.28	11.52	0.12	2.67	0.11	0.74	0.10	3.21	0.79	6.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60	1.66
	Total Plantation	1.07	12.63	1.22	18.35	1.19	48.97	1.31	29.11	1.70	11.42	1.23	39.42	3.98	30.83	1.79	22.63	0.27	4.79	1.19	11.74	0.92	9.18	0.57	16.38	0.10	1.63	16.54	17.18
ACTIVE MINING	Total Vegetation	2.04	24.09	1.75	26.32	1.20	49.38	1.82	40.44	4.10	27.54	1.25	40.06	4.84	37.49	2.12	26.80	1.09	19.33	2.26	22.29	1.98	19.76	0.70	20.11	0.85	13.84	26.00	27.00
	Coal Quarry	0.97	11.45	1.17	17.59	0.13	5.35	0.65	14.44	1.33	8.93	0.49	15.71	1.08	8.37	1.59	20.10	0.74	13.12	0.29	2.86	1.81	18.06	0.64	18.39	1.86	30.29	12.75	13.24
	Coal Dump	0.13	1.53	0.03	0.45	0.04	1.65	0.02	0.44	0.04	0.27	0.05	1.60	0.15	1.16	0.07	0.88	0.06	1.06	0.04	0.39	0.26	2.59	0.02	0.57	0.00	0.00	0.91	0.94
	Advance Quarry Site	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09
	Quarry Filled With Water	0.02	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.42	2.82	0.00	0.00	0.47	3.64	0.24	3.03	0.00	0.00	0.04	0.39	0.05	0.50	0.03	0.86	0.00	0.00	1.27	1.32
	Total Area under Active Mining	1.12	13.22	1.20	18.05	0.17	7.00	0.67	14.89	1.79	12.02	0.54	17.31	1.70	13.17	1.90	24.02	0.80	14.18	0.46	4.54	2.12	21.16	0.69	19.83	1.86	30.29	15.02	15.60
	Barren OB Dump	1.77	20.90	0.45	6.77	0.19	7.82	1.15	25.56	3.58	24.04	0.31	9.94	0.90	6.97	1.62	20.48	0.97	17.20	1.18	11.64	1.52	15.17	0.96	27.59	0.78	12.70	15.38	15.97
	Barren Backfilled Area (Technical Reclamation)	0.44	5.19	0.83	12.48	0.76	31.28	0.41	9.11	0.21	1.41	0.65	20.83	0.91	7.05	0.62	7.84	0.00	0.00	0.00	0.00	0.89	8.88	0.02	0.57	0.00	0.00	5.74	5.96
	Total Area	2.21	26.09	1.28	19.25	0.95	39.09	1.56	34.67	3.79	25.45	0.96	30.77	1.81	14.02	2.24	28.32	0.97	17.20	1.18	11.64	2.41	24.05	0.98	28.16	0.78	12.70	21.12	21.93
	Total Area Under Mine Operation	3.33	39.32	2.48	37.29	1.12	46.09	2.23	49.56	5.58	37.47	1.50	48.08	3.51	27.19	4.14	52.34	1.77	31.38	1.64	16.17	4.53	45.21	1.67	47.99	2.64	43.00	36.14	37.53
WASTELANDS	Waste Lands	0.57	6.73	0.27	4.06	0.03	1.23	0.22	4.89	0.65	4.37	0.11	3.53	0.41	3.18	0.50	6.32	0.46	8.16	0.68	6.71	0.47	4.69	0.25	7.18	0.11	1.79	4.73	4.91
	Fly Ash Pond / Sand Body	0.05	0.59	0.05	0.75	0.02	0.00	0.04	0.89	0.03	0.20	0.00	0.00	0.06	0.46	0.00	0.00	0.04	0.71	0.05	0.49	0.00	0.00	0.03	0.86	0.00	0.00	0.37	0.38
	Total Wasteland	0.62	7.32	0.32	4.81	0.05	1.23	0.26	5.78	0.68	4.57	0.11	3.53	0.47	3.64	0.50	6.32	0.50	8.87	0.73	7.20	0.47	4.69	0.28	8.05	0.11	1.79	5.10	5.30
WATERBODIES	Reservoir, nallah, ponds	0.15	1.77	0.02	0.30	0.02	0.82	0.04	0.89	0.02	0.13	0.08	2.56	0.02	0.15	0.00	0.00	0.05	0.89	0.11	1.08	0.02	0.20	0.08	2.30	0.07	1.14	0.68	0.71
	Total Waterbodies	0.15	1.77	0.02	0.30	0.02	0.82	0.04	0.89	0.02	0.13	0.08	2.56	0.02	0.15	0.00	0.00	0.05	0.89	0.11	1.08	0.02	0.20	0.08	2.30	0.07	1.14	0.68	0.71
AGRICULTURE	Crop Lands	0.00	0.00	0.50	7.52	0.00	0.00	0.00	0.35	2.35	0.00	0.00	0.00	0.00	0.00	0.00	0.70	12.41	1.67	16.47	0.00	0.00	0.00	0.00	0.51	8.31	3.73	3.87	
	Fallow Lands	2.25	26.56	1.58	23.76	0.02	0.82	0.12	2.67	3.99	26.80	0.04	1.28	3.94	30.52	1.08	13.65	1.45	25.71	3.56	35.11	2.80	27.94	0.67	19.25	1.96	31.92	23.46	24.36
	Total Agriculture	2.25	26.56	2.08	31.28	0.02	0.82	0.12	2.67	4.34	29.15	0.04	1.28	3.94	30.52	1.08	13.65	2.15	38.12	5.23	51.58	2.80	27.94	0.67	19.25	2.47	40.23	27.19	28.23
SETTLEMENTS	Urban Settlement	0.02	0.24	0.00	0.00	0.01	0.41	0.01	0.22	0.01	0.07	0.13	4.17	0.00	0.00	0.04	0.51	0.04	0.71	0.07	0.69	0.00	0.00	0.00	0.00	0.00	0.33	0.34	
	Rural Settlement	0.04	0.47	0.00	0.00	0.00	0.00	0.01	0.22	0.06	0.40	0.00	0.00	0.05	0.39	0.00	0.00	0.03	0.53	0.02	0.20	0.16	1.60	0.00	0.00	0.00	0.37	0.38	
	Industrial Settlement	0.02	0.24	0.00	0.00	0.01	0.41	0.01	0.22	0.10	0.67	0.01	0.32	0.08	0.62	0.03	0.38	0.01	0.18	0.08	0.79	0.06	0.60	0.08	2.30	0.00	0.00	0.49	0.51
	Total Settlement	0.08	0.94	0.00	0.00	0.02	0.82	0.03	0.67	0.17	1.14	0.14	4.49	0.13	1.01	0.07	0.88	0.08	1.42	0.17	1.68	0.22	2.20	0.08	2.30	0.00	0.00	1.19	1.24
Grand Total		8.47	100.00	6.65	100.00	2.43	99.18	4.50	100.00	14.89	100.00	3.12	100.00	12.91	100.00	7.91	100.00	5.64	100.00	10.14	100.00	10.02	100.00	3.48	100.00	6.14	100.00	96.30	100.00

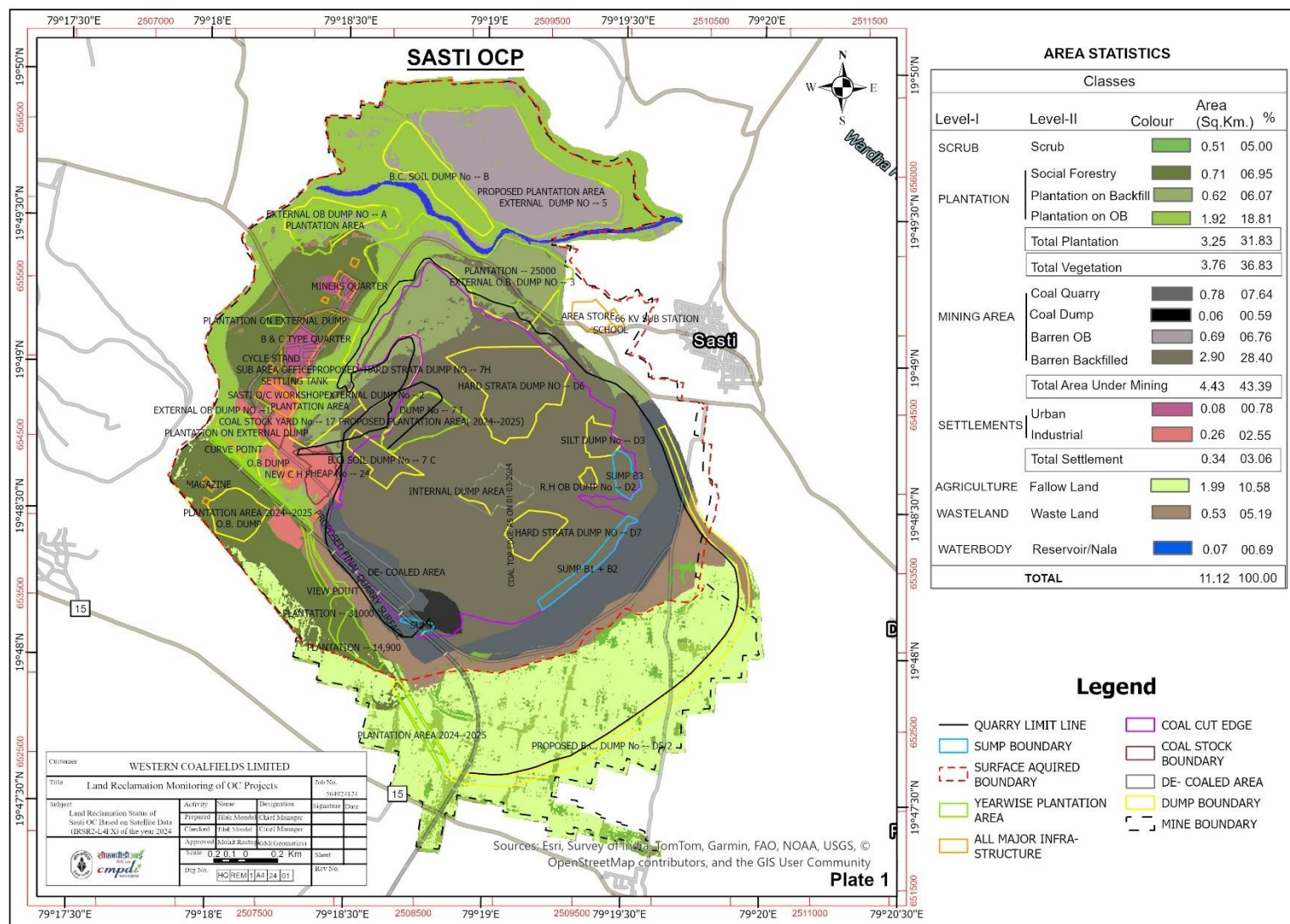


Plate 5-1: Land Use/Cover map of Sasti OCP

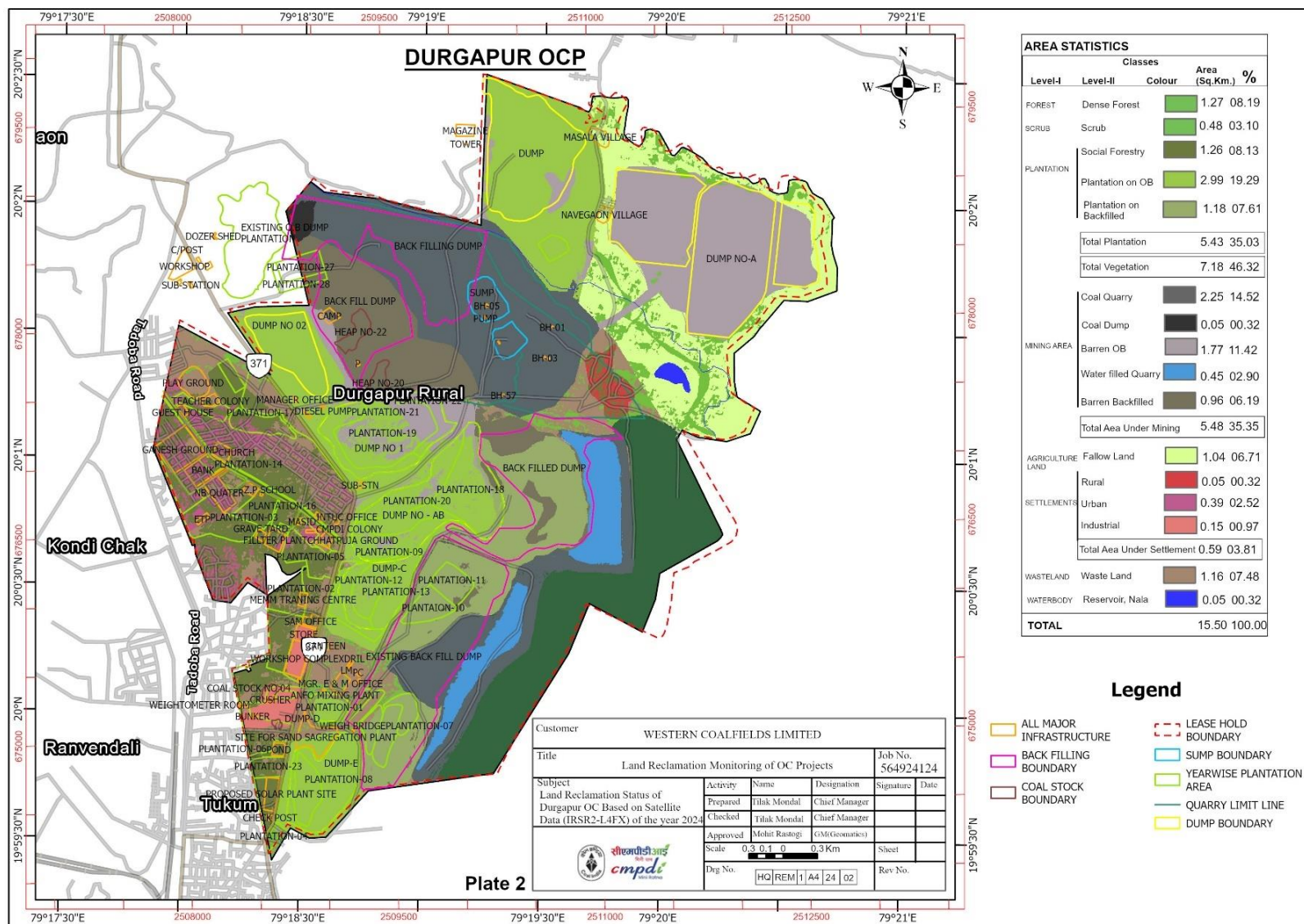


Plate 5-2: Land Use/Cover map of Durgapur OCP

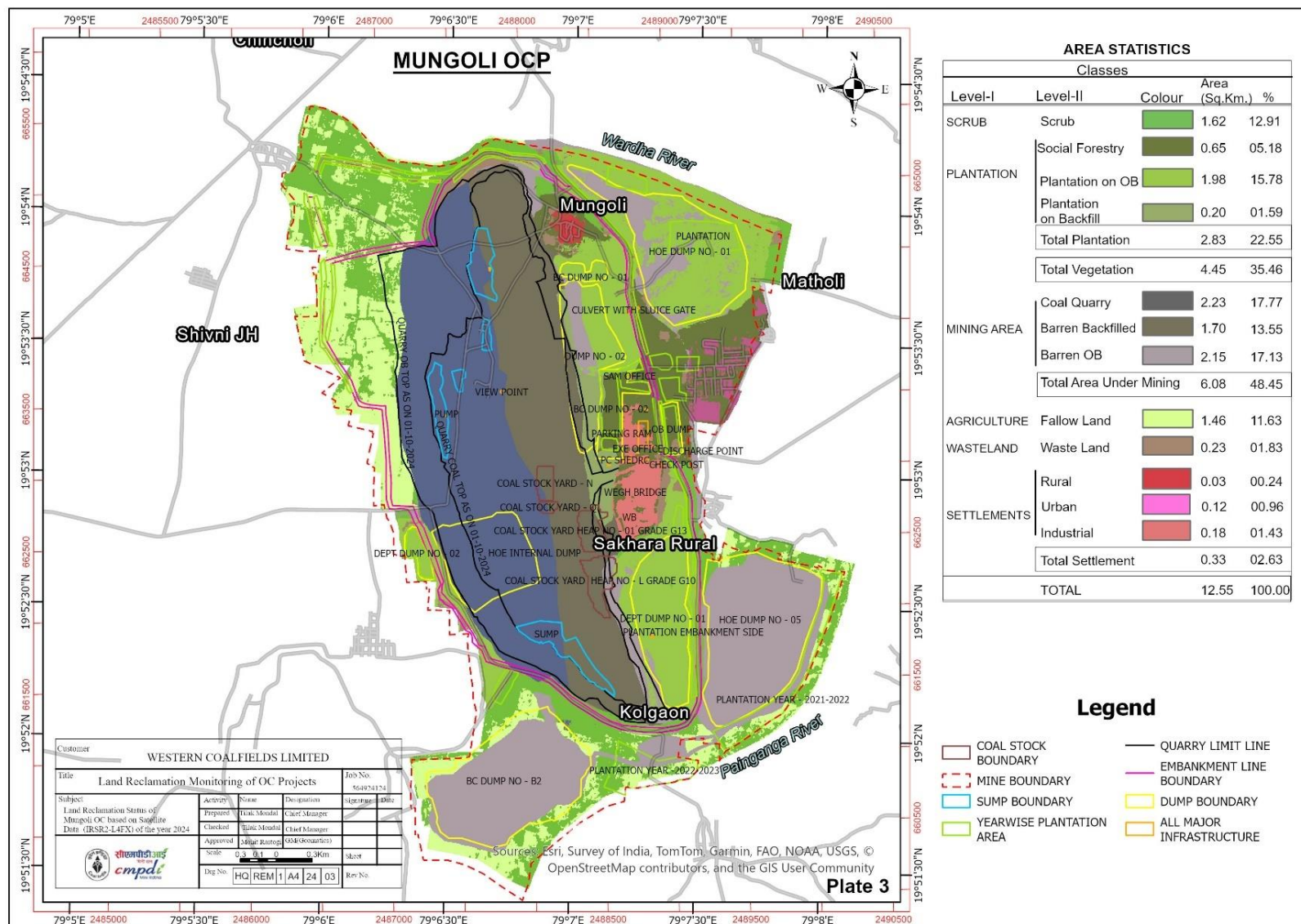


Plate 5-3: Land Use/Cover map of Mungoli OCP

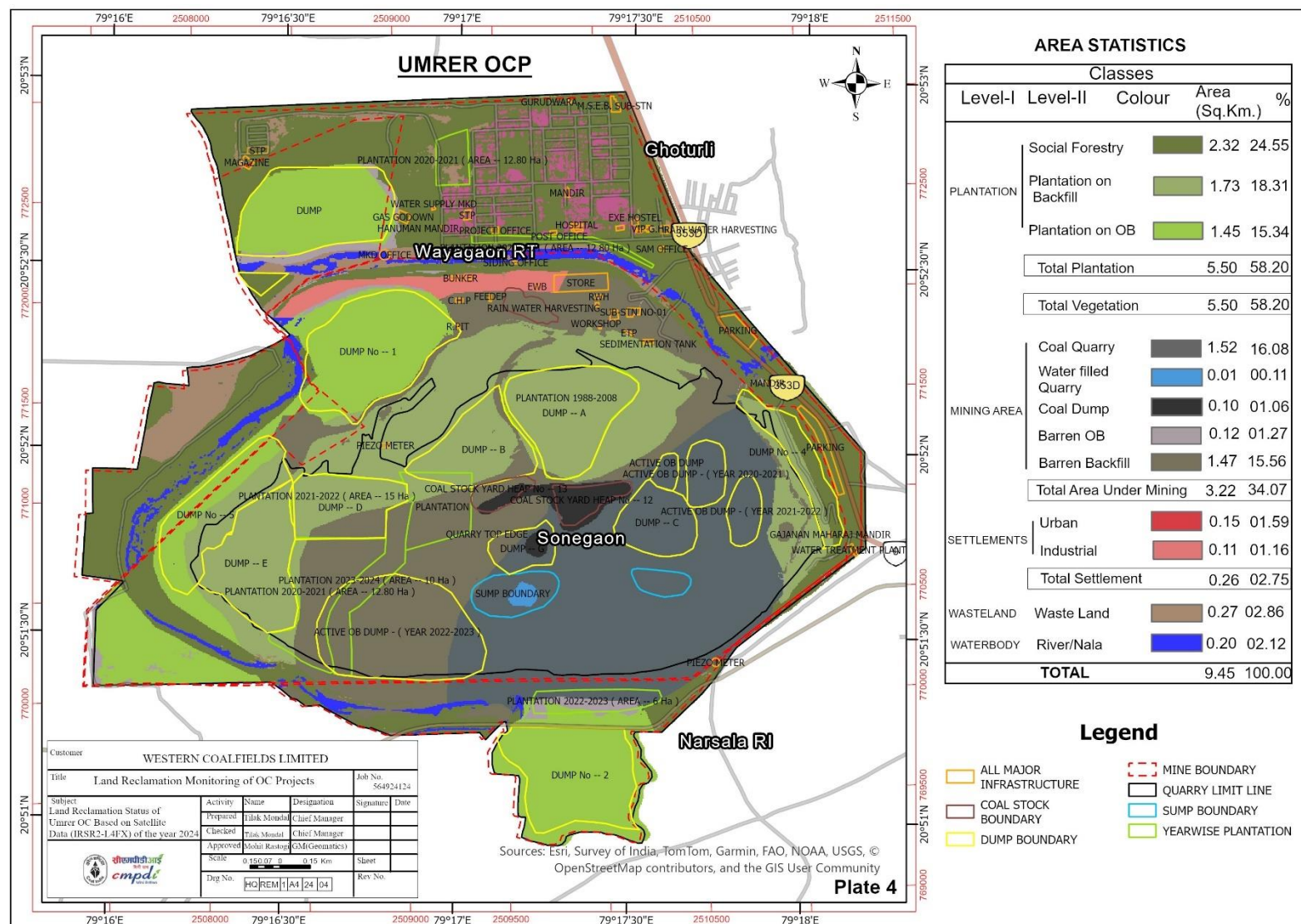


Plate 5-4: Land Use/Cover map of Umrer OCP

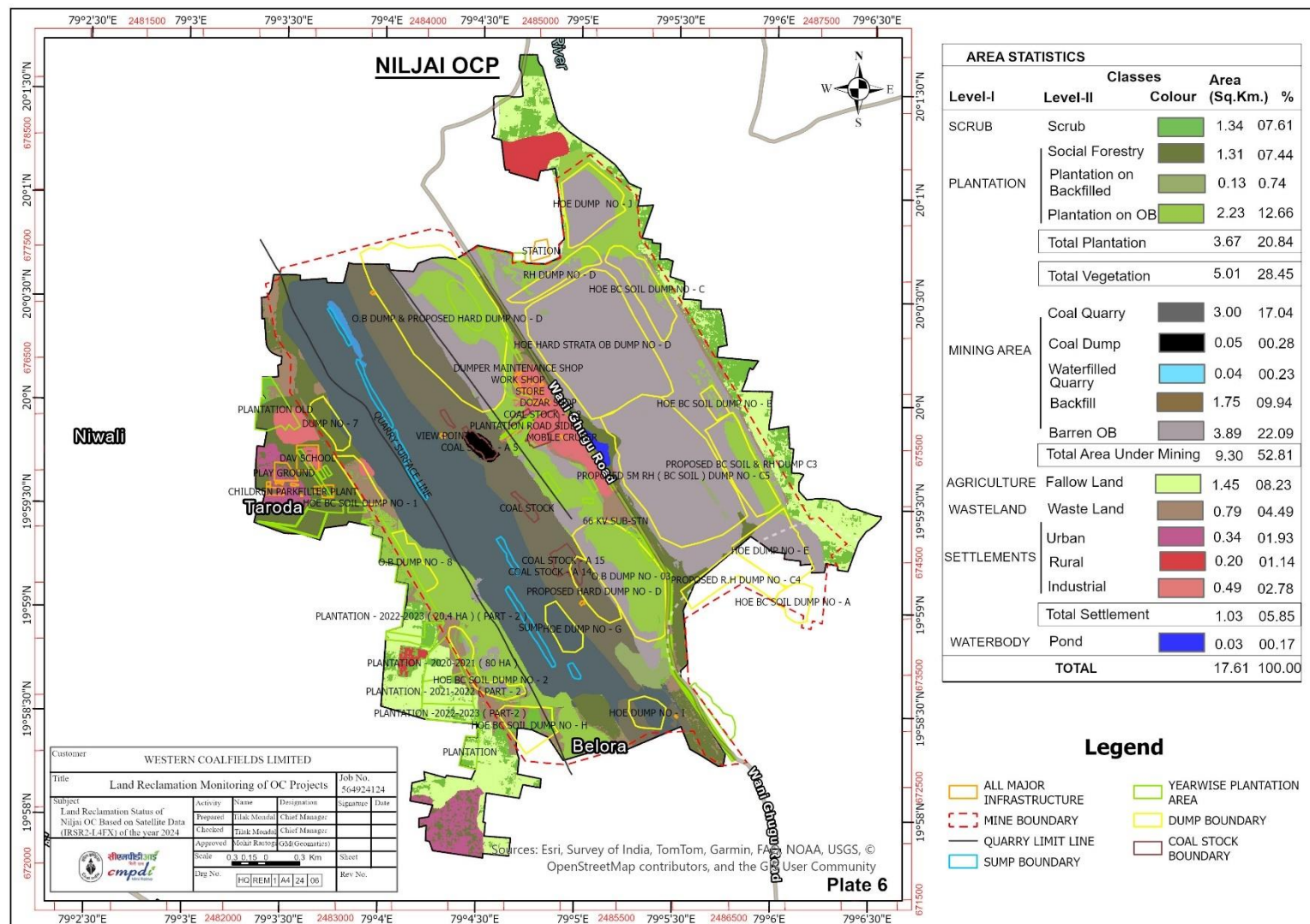


Plate 5-6: Land Use/Cover map of Niljai OCP

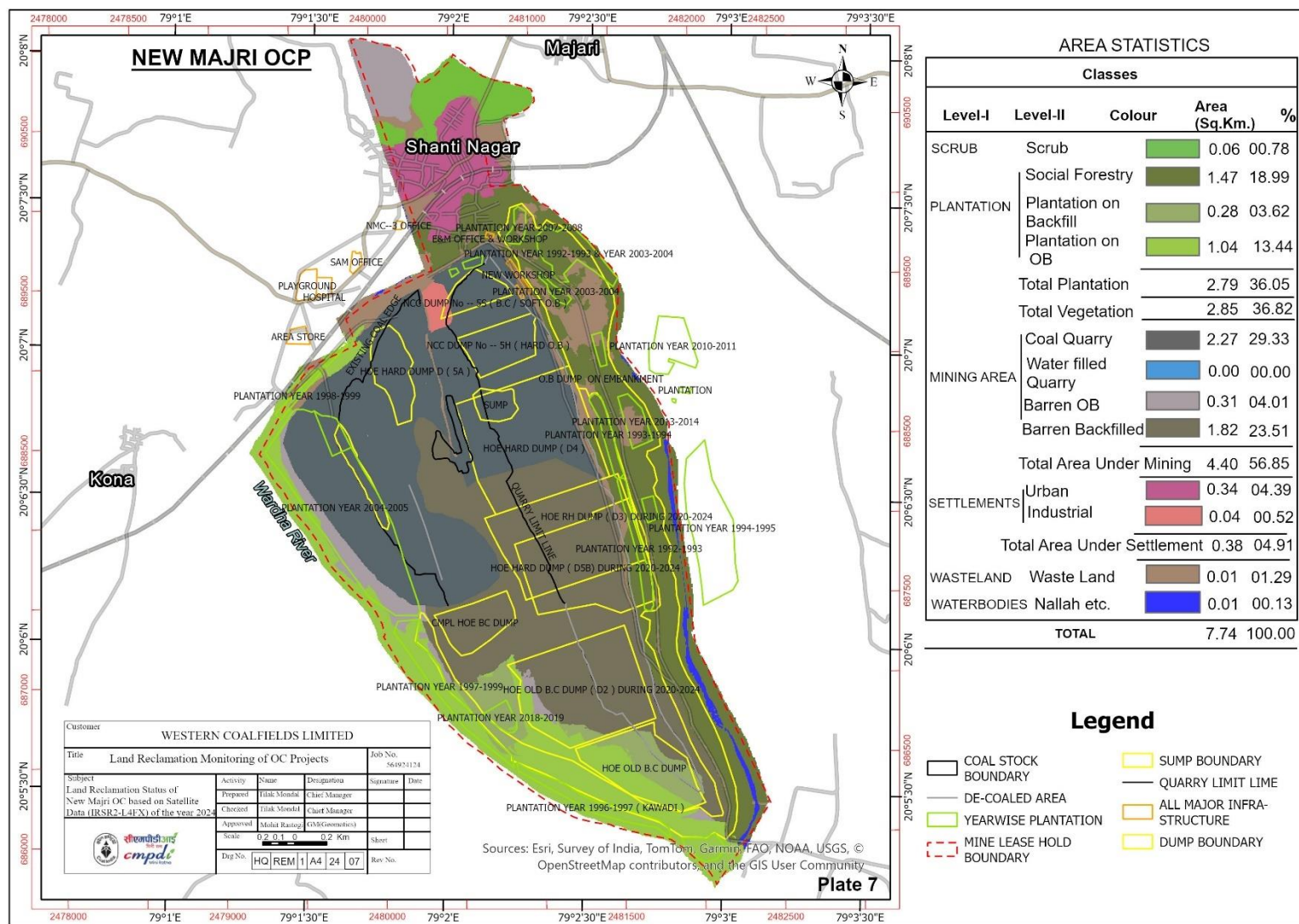


Plate 5-7: Land Use/Cover map of New Majri OCP

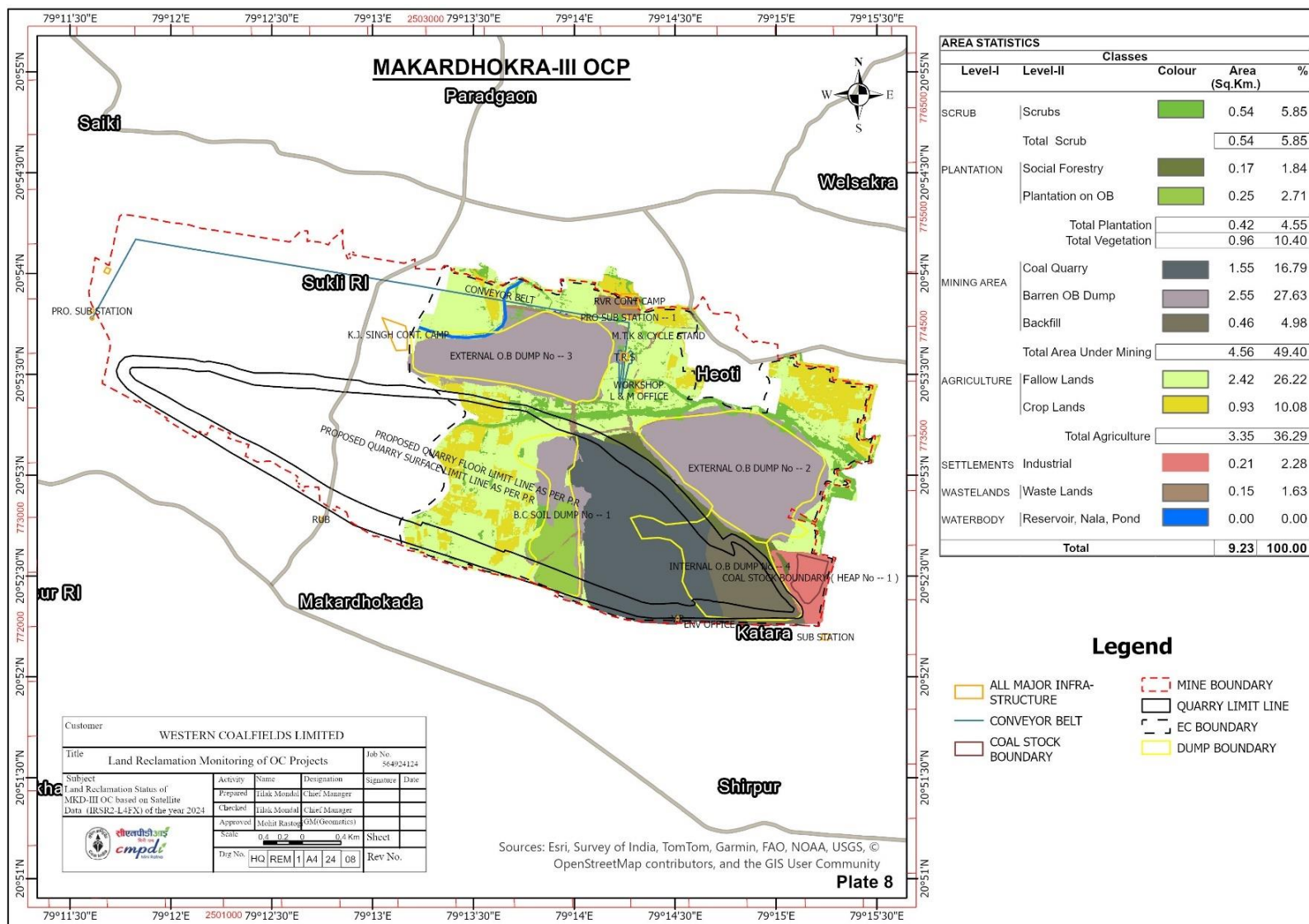


Plate 5-8: Land Use/Cover map of Makardhokra-III OCP

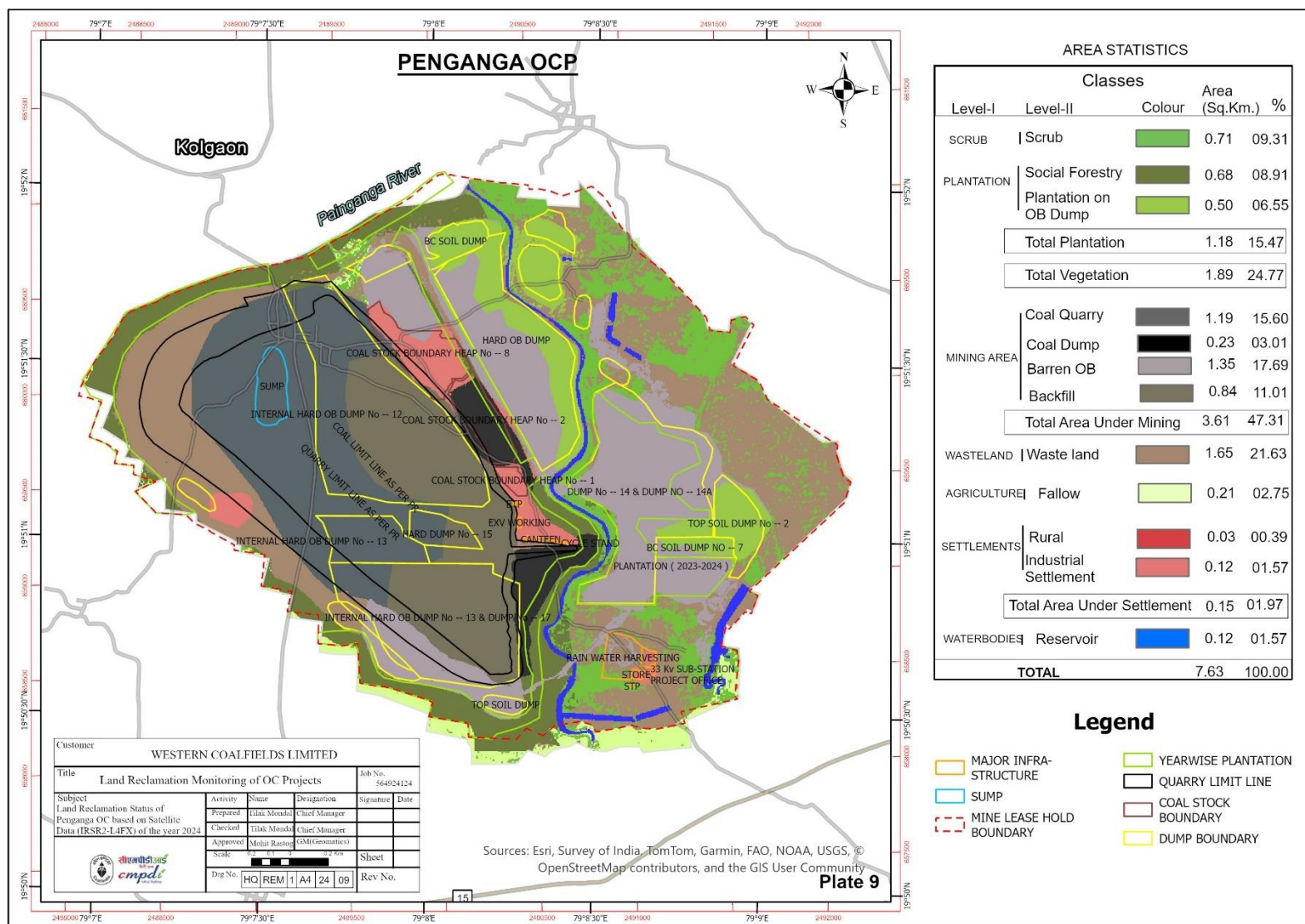


Plate 5-9: Land Use/Cover map of Penganga OCP

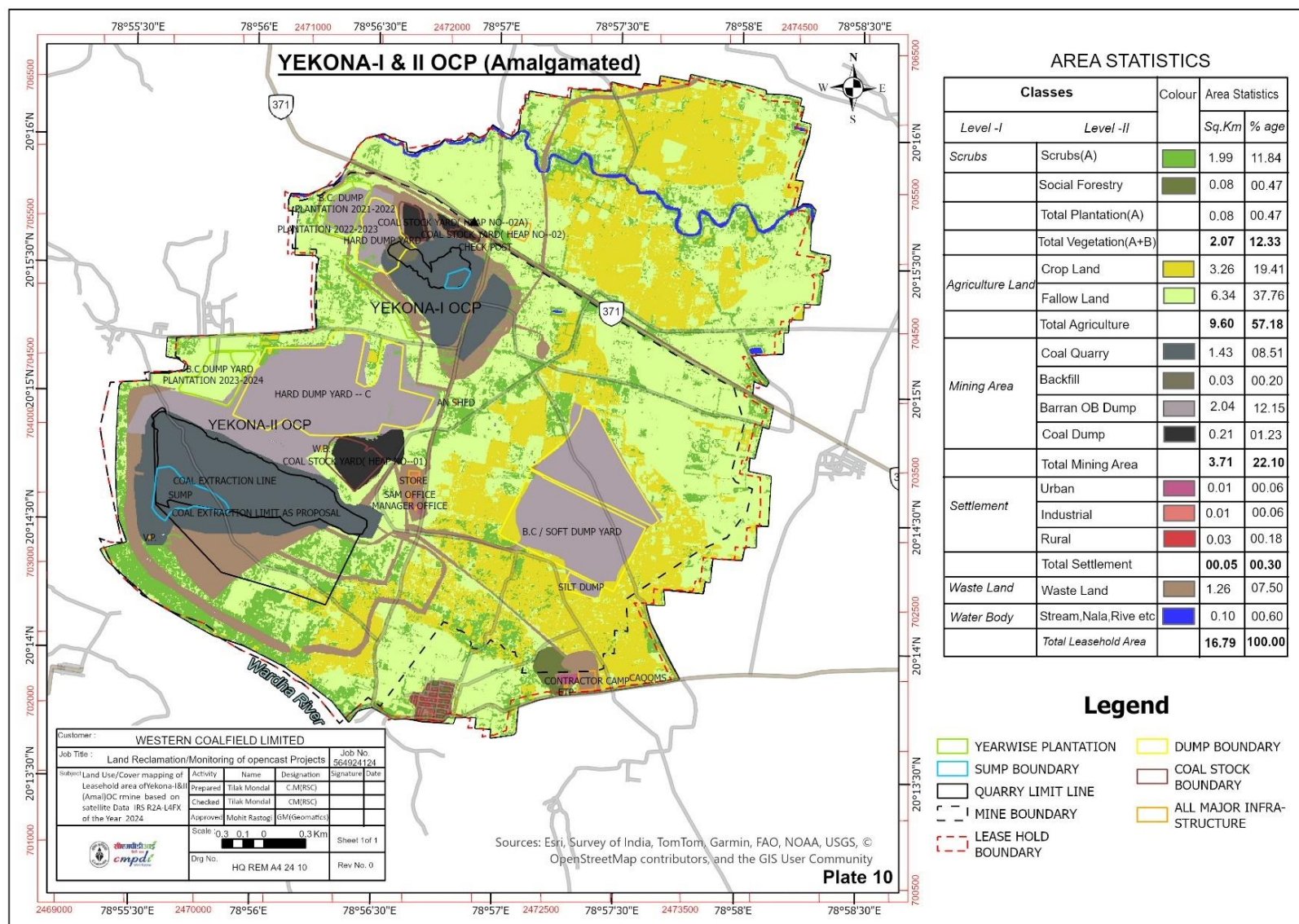


Plate 5-10: Land Use/Cover map of Yekona-I & II OCP(Amalgamated)

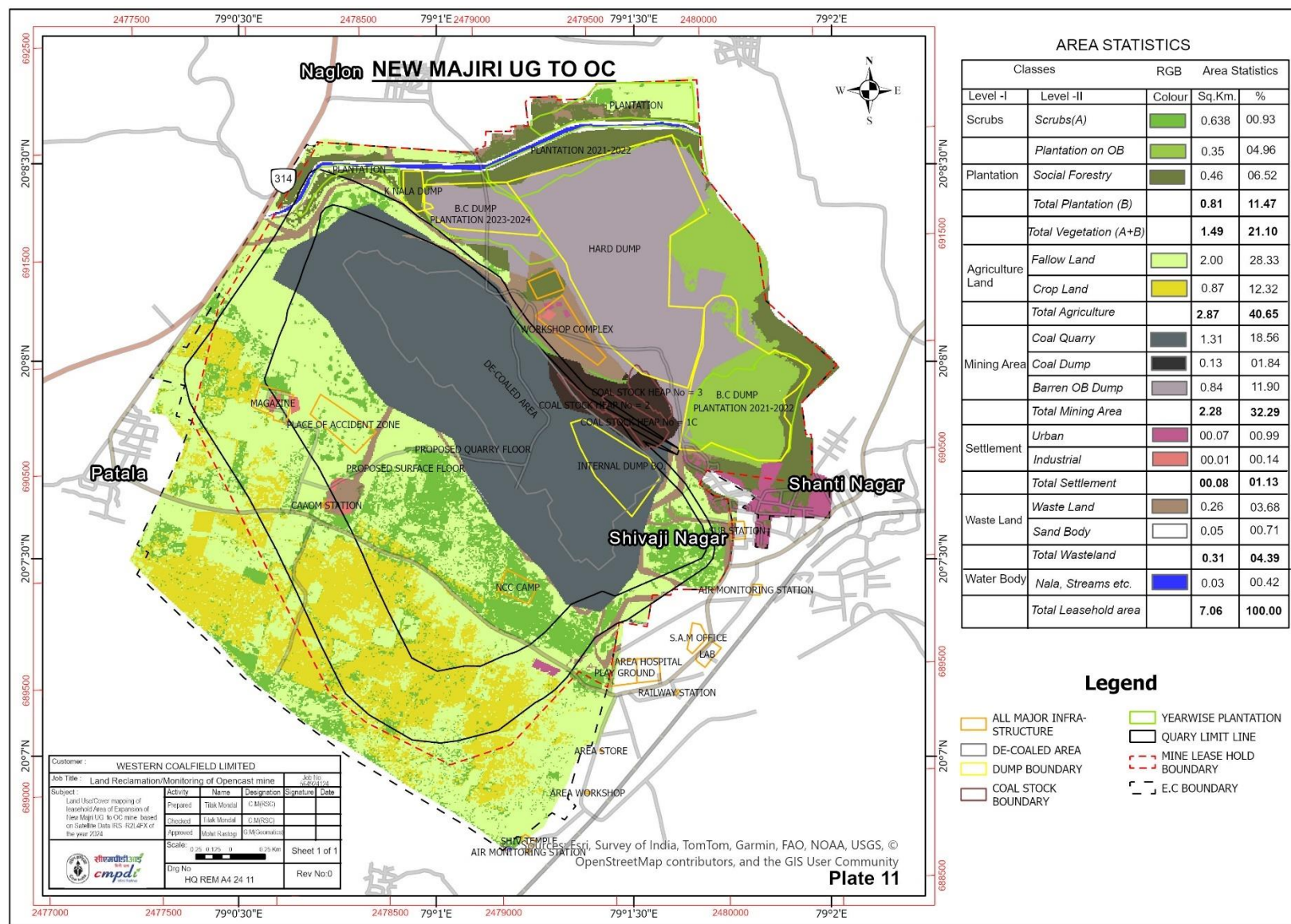


Plate 5-11: Land Use/Cover map of New Majiri UG to OCP

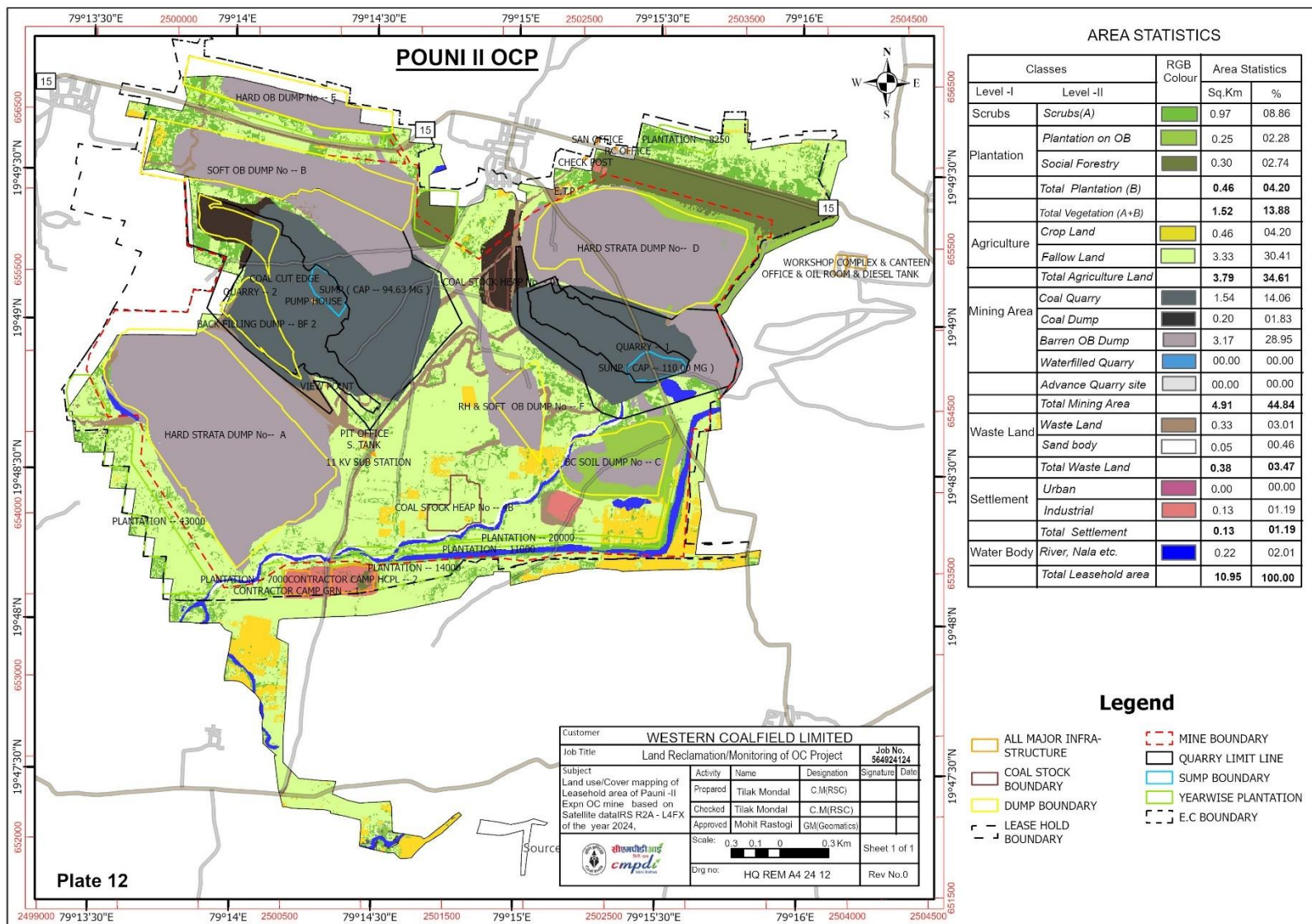


Plate 5-12: Land Use/Cover map of Pouni-II OCP

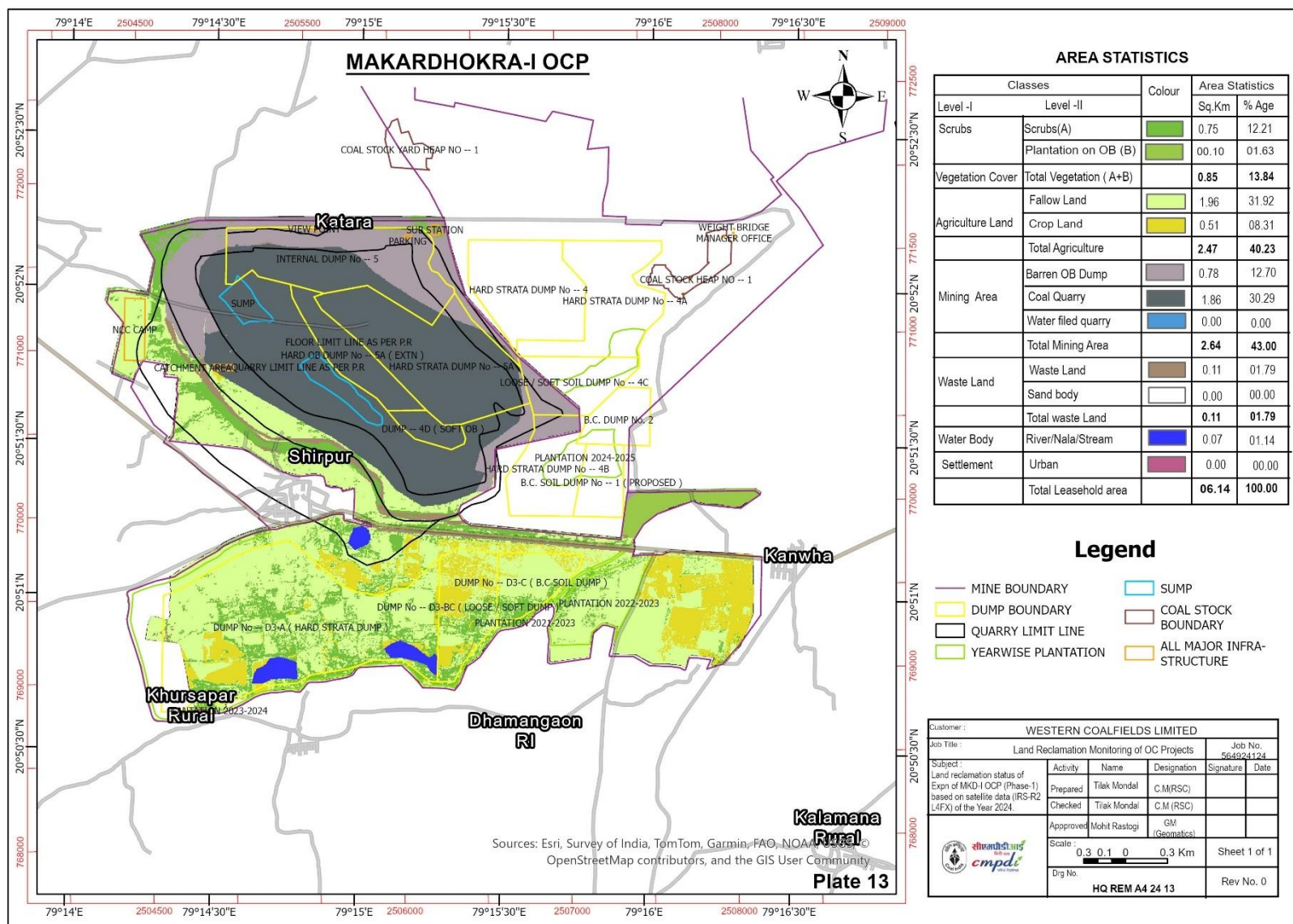


Plate 5-13: Land Use/Cover map of Makardhokra-I OCP

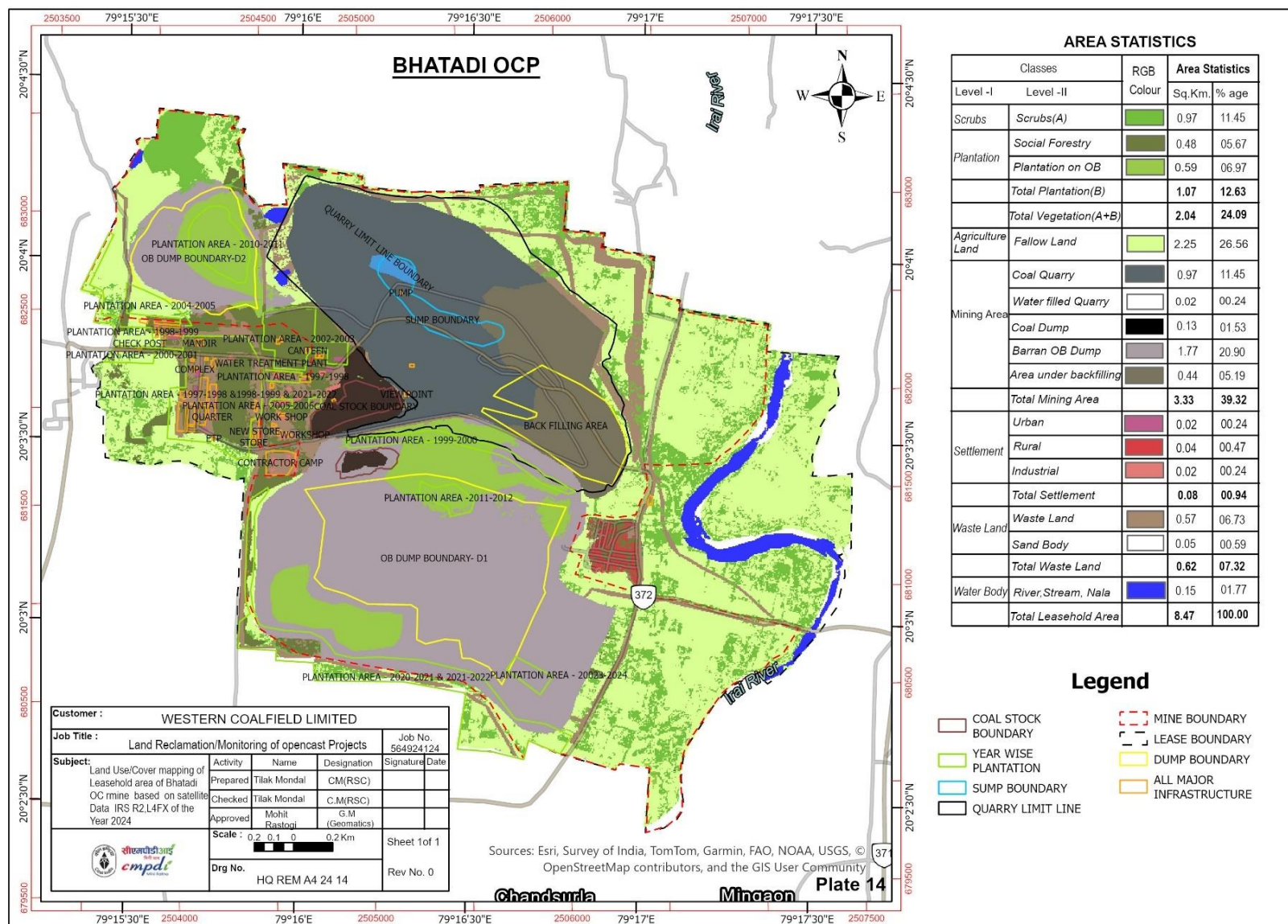


Plate 5-14: Land Use/Cover map of Bhatadi OCP

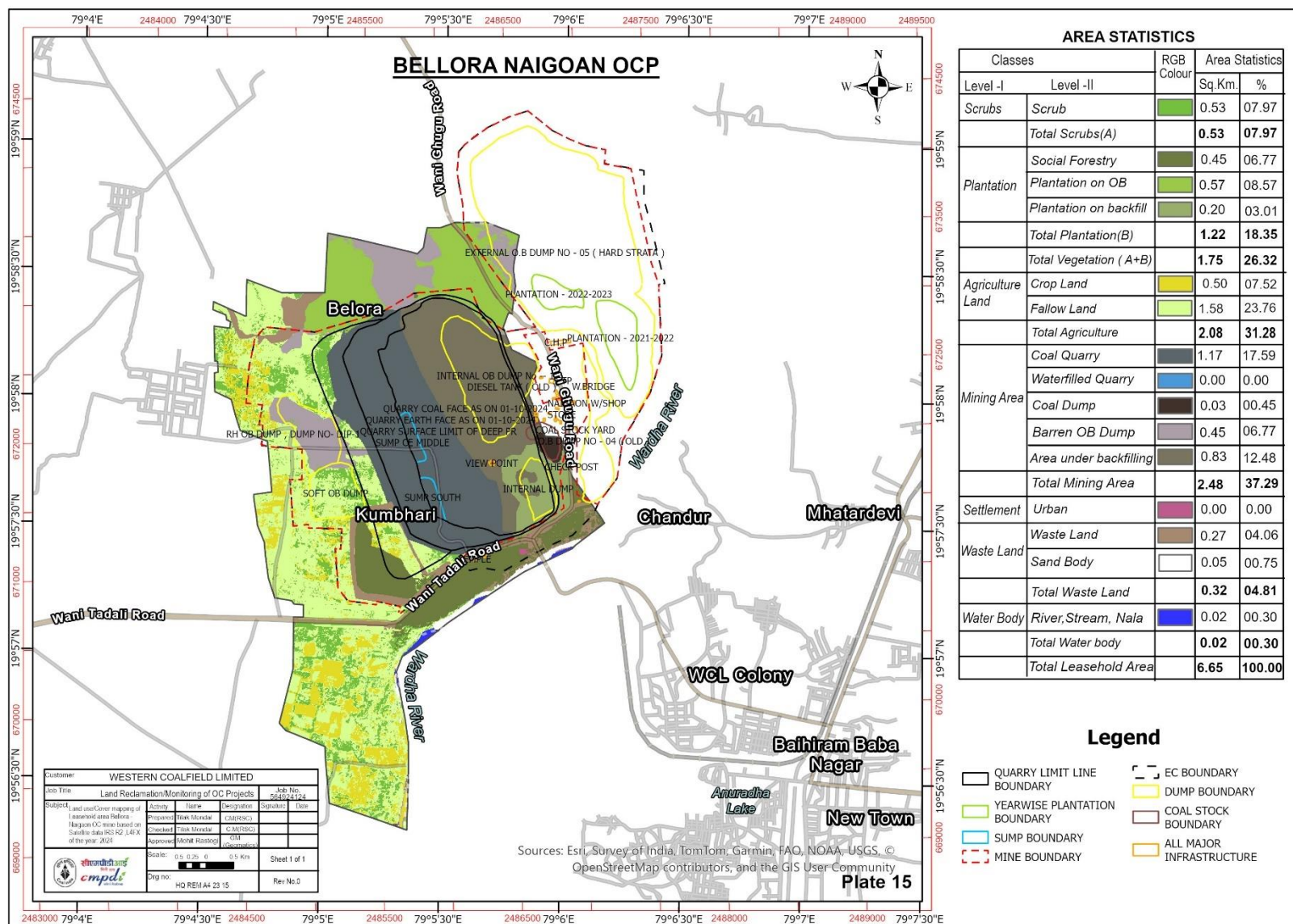


Plate 5-15: Land Use/Cover map of Bellora Naigoan OCP

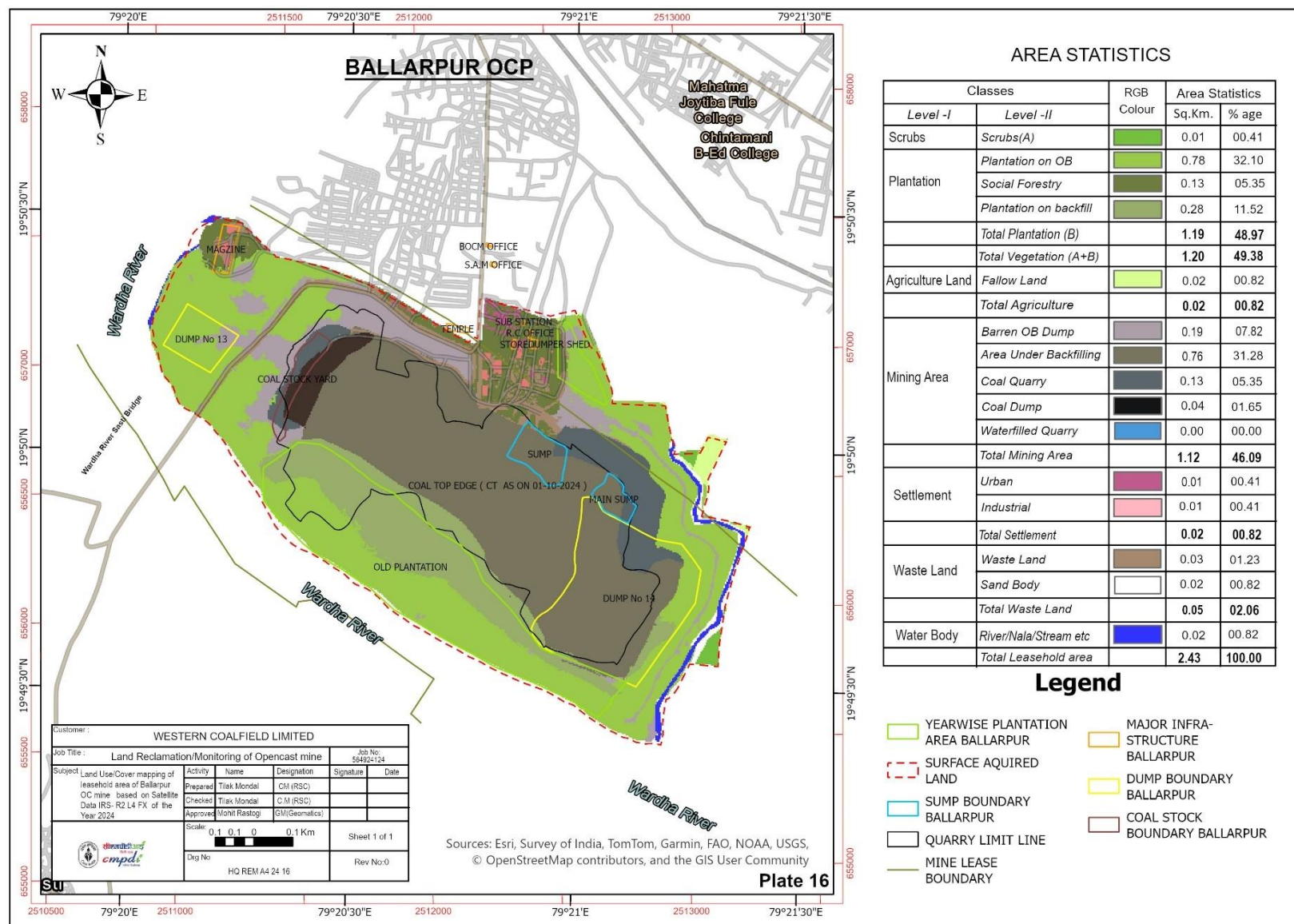


Plate 5-16: Land Use/Cover map of Ballarpur OCP

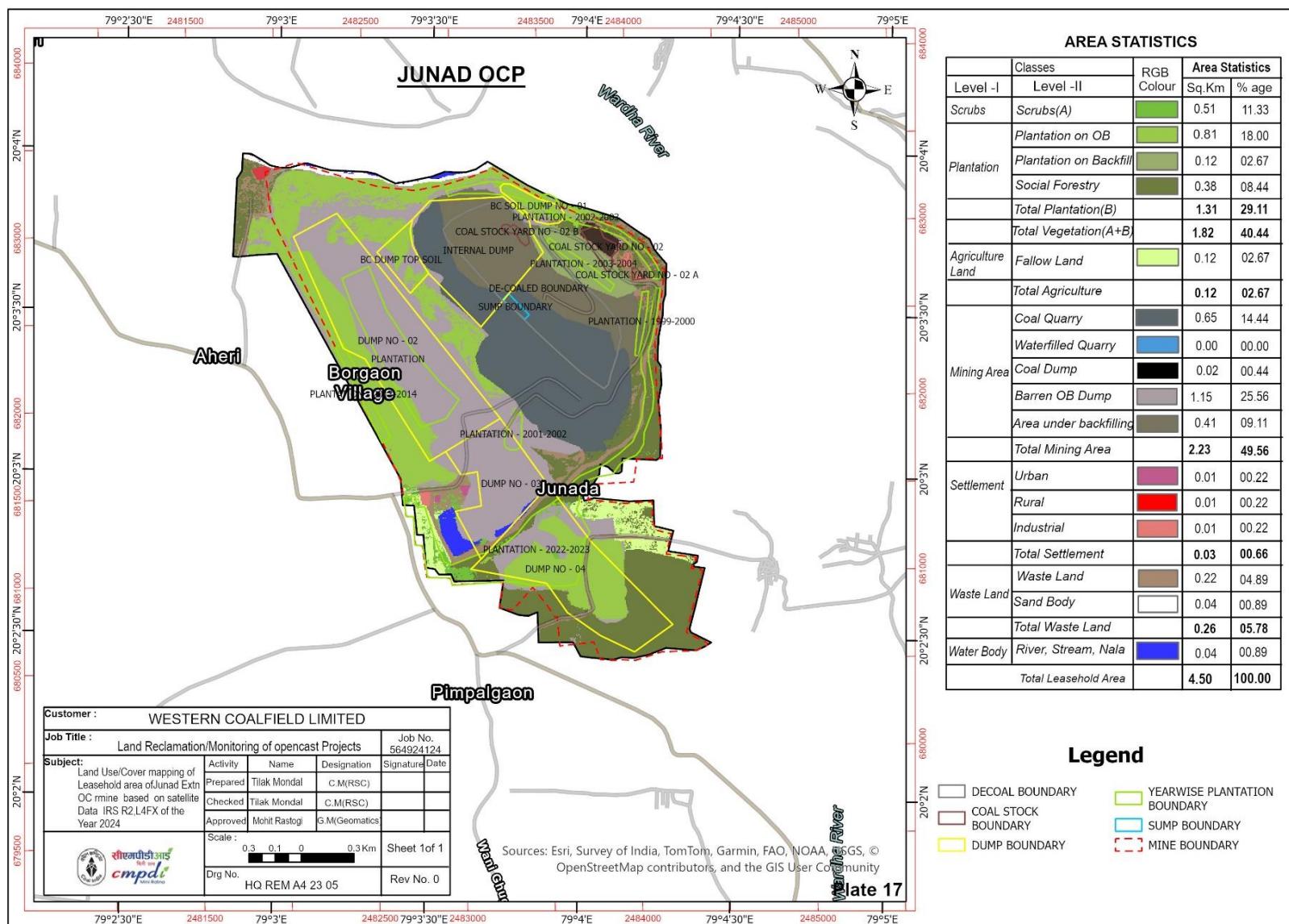


Plate 5-17: Land Use/Cover map of Junad OCP

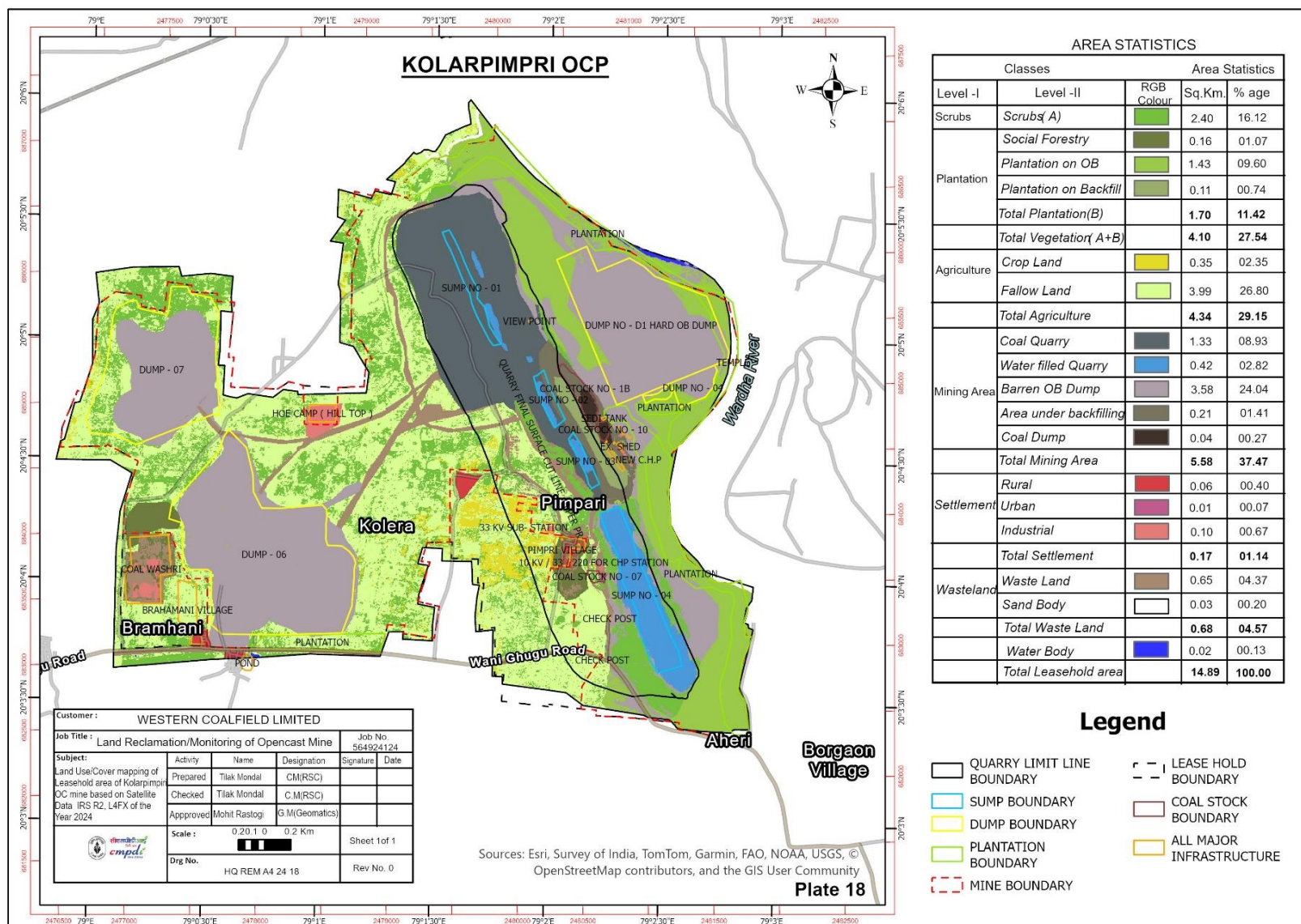


Plate 5-18: Land Use/Cover map of Kolarpimpri OCP

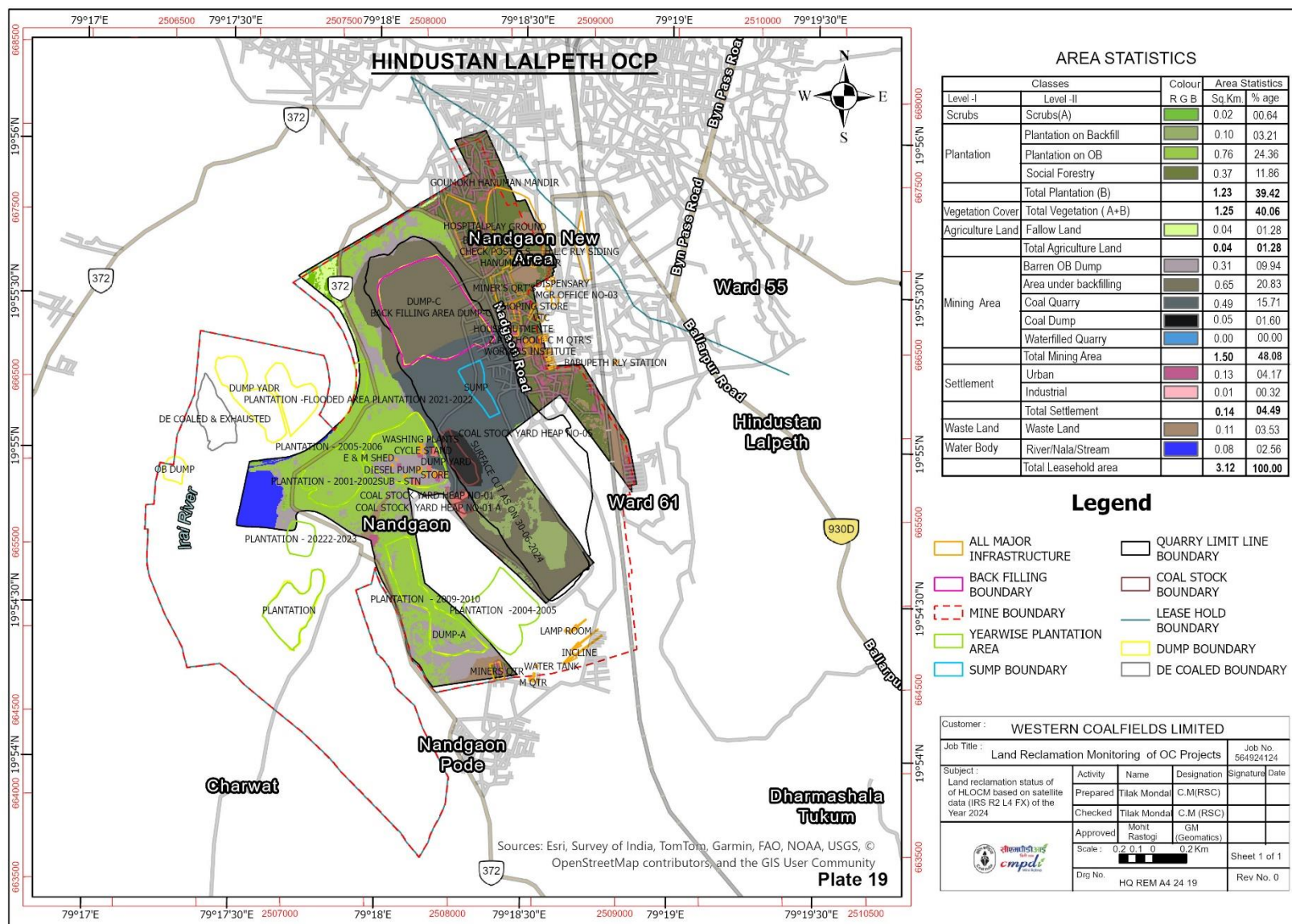


Plate 5-19: Land Use/Cover map of Hindustan Lalpeth OCP

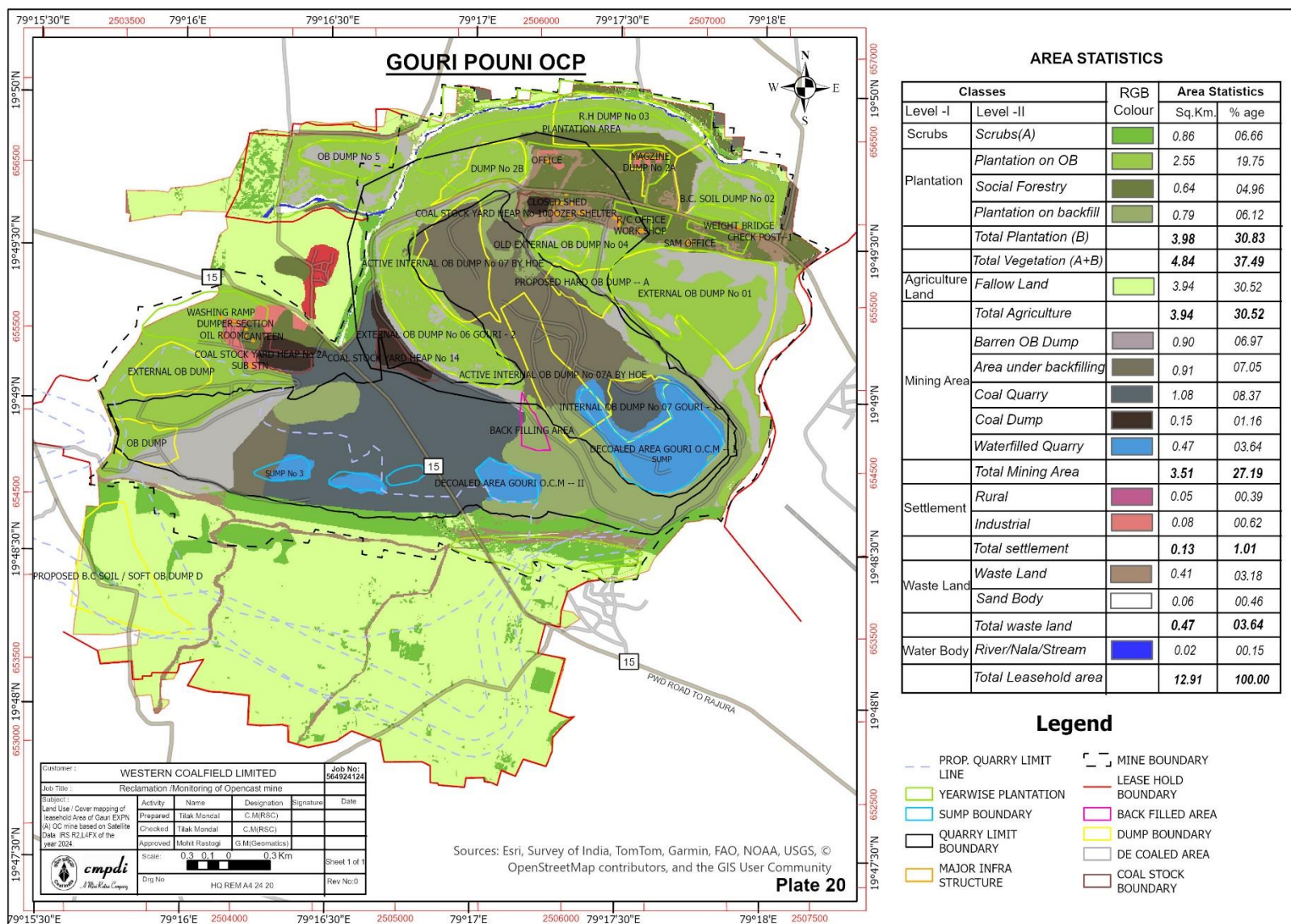
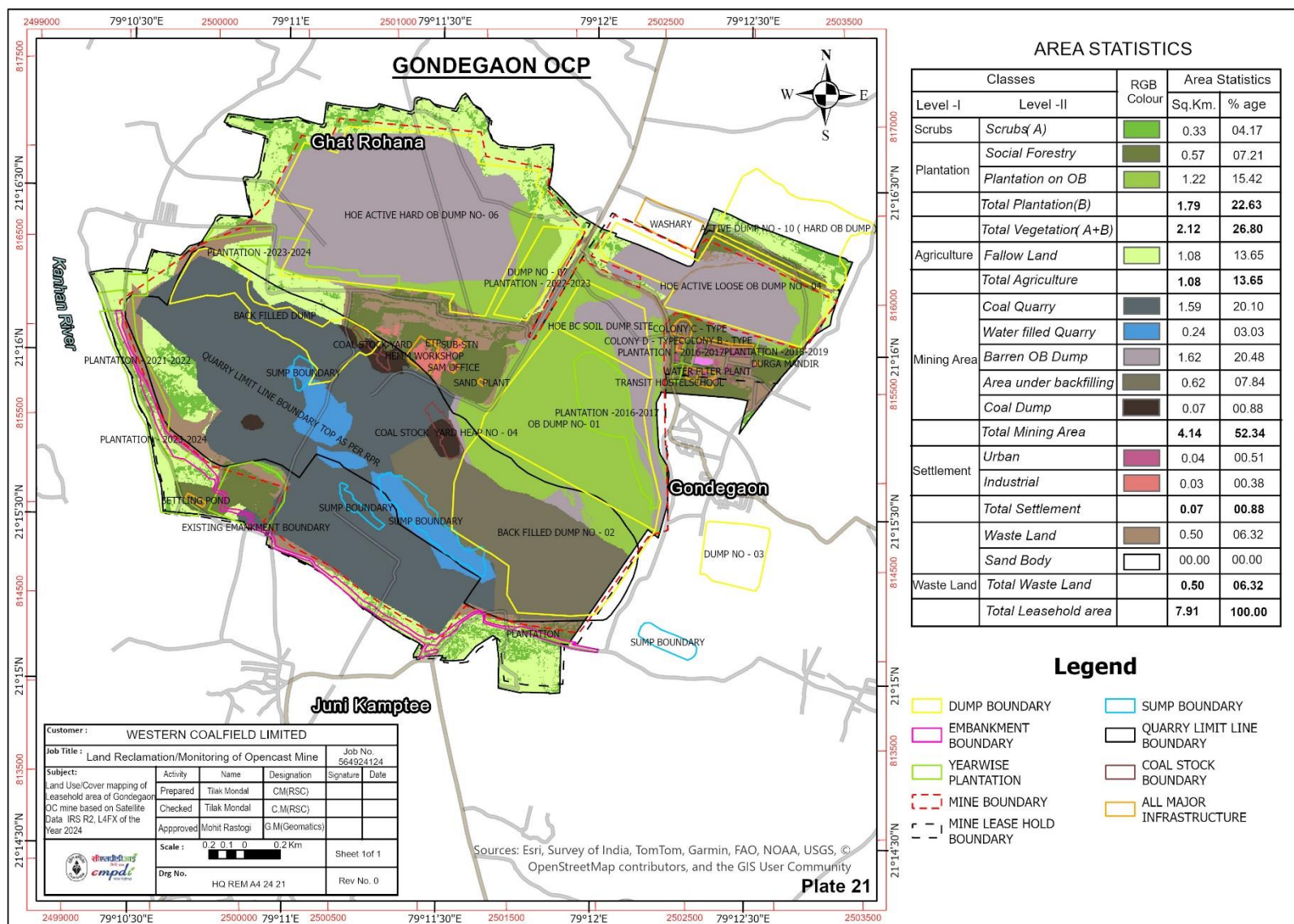


Plate 5-20: Land Use/Cover map of Gauri Pouni OCP



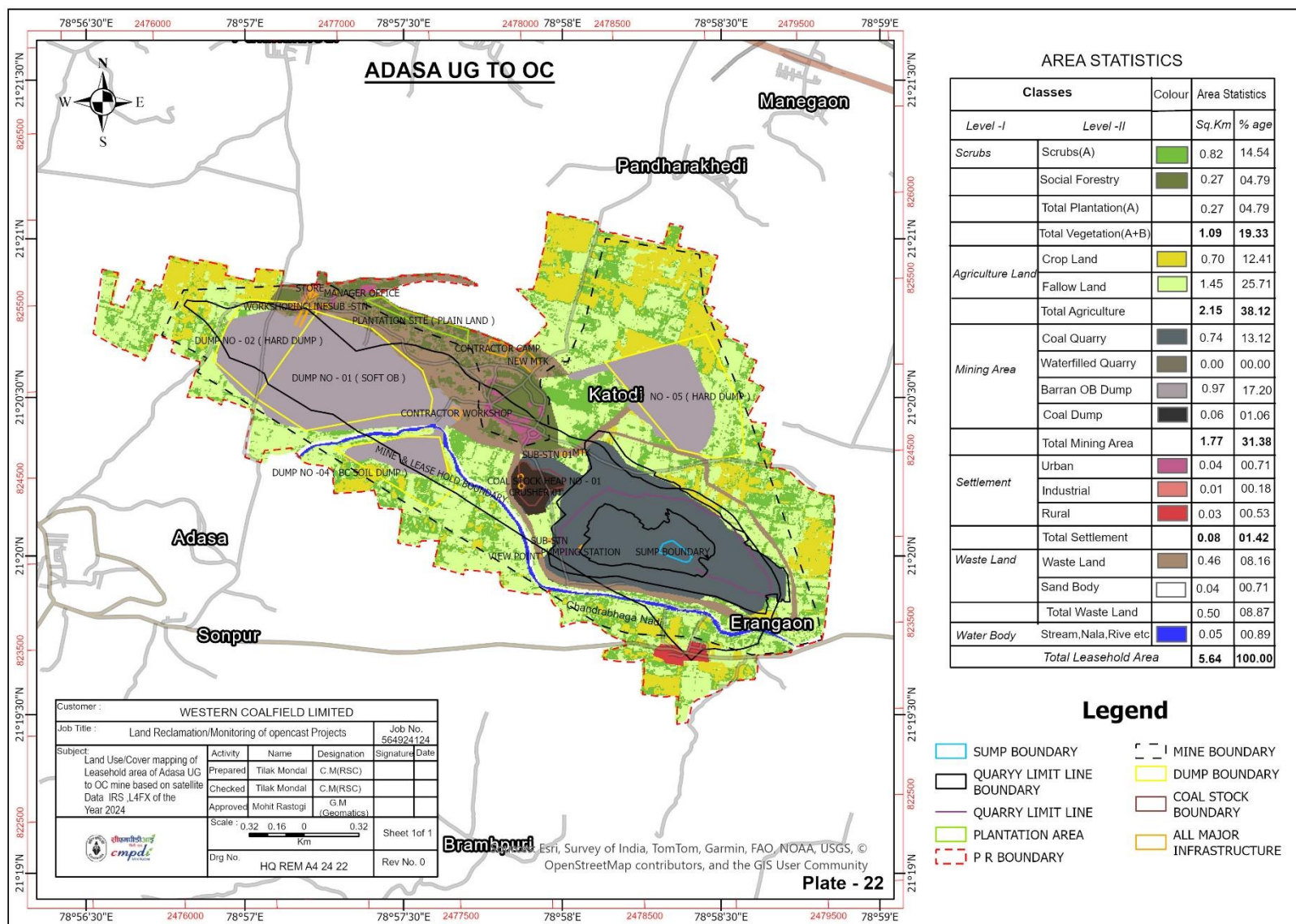


Plate 5-22: Land Use/Cover map of Adasa UG to OCP

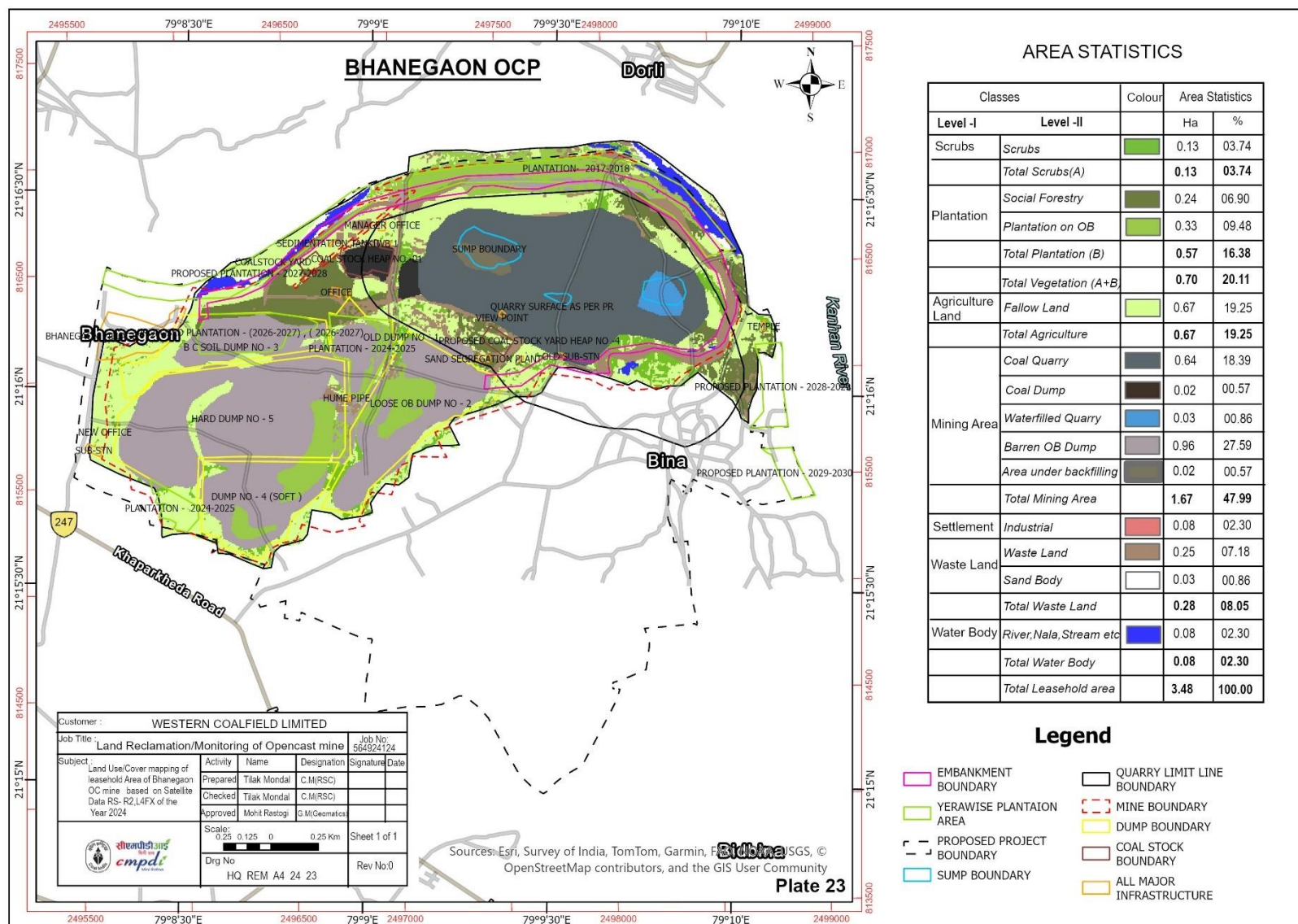


Plate 5-23: Land Use/Cover map of Bhanegaon OCP

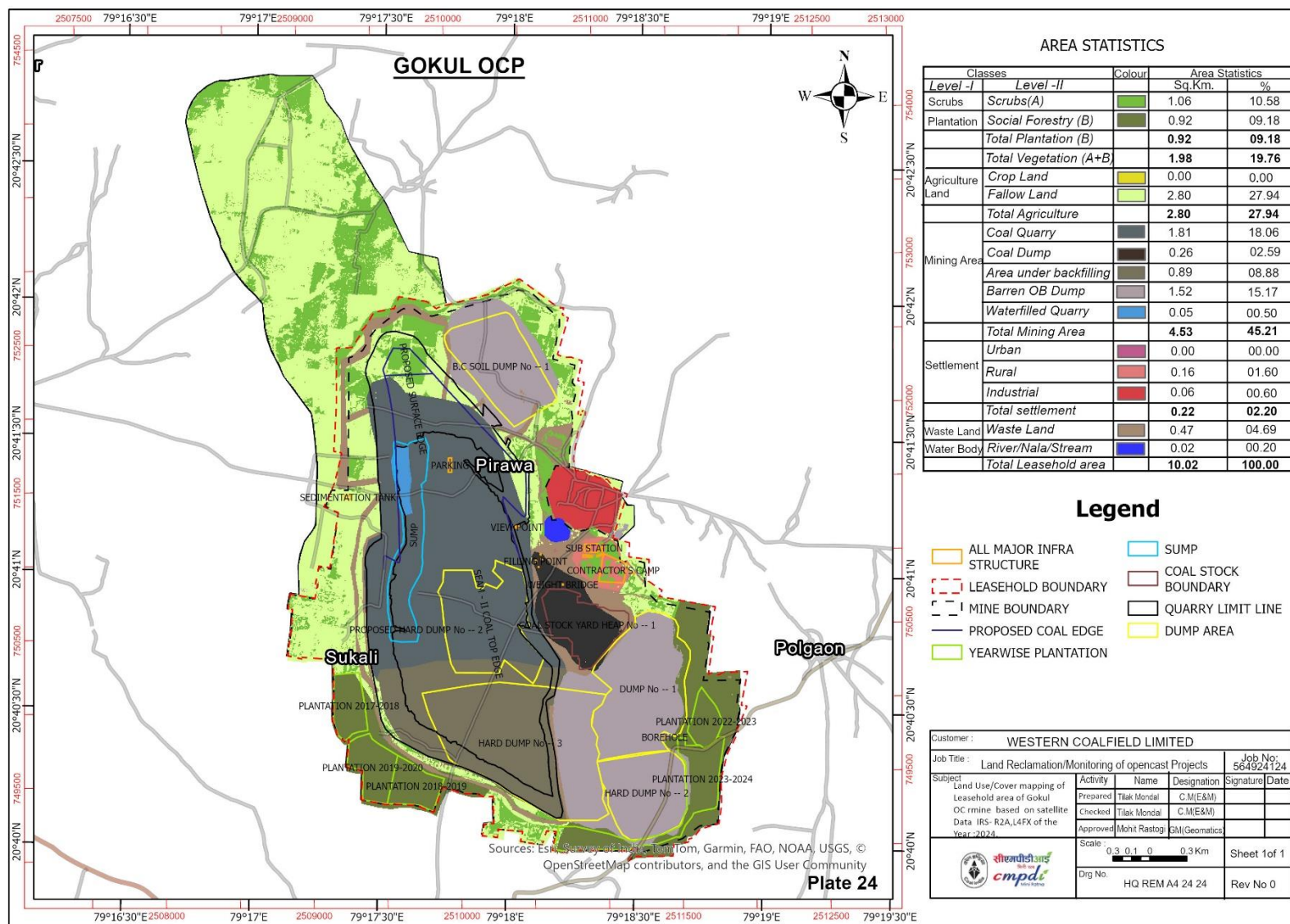


Plate 5-24: Land Use/Cover map of Gokul OCP

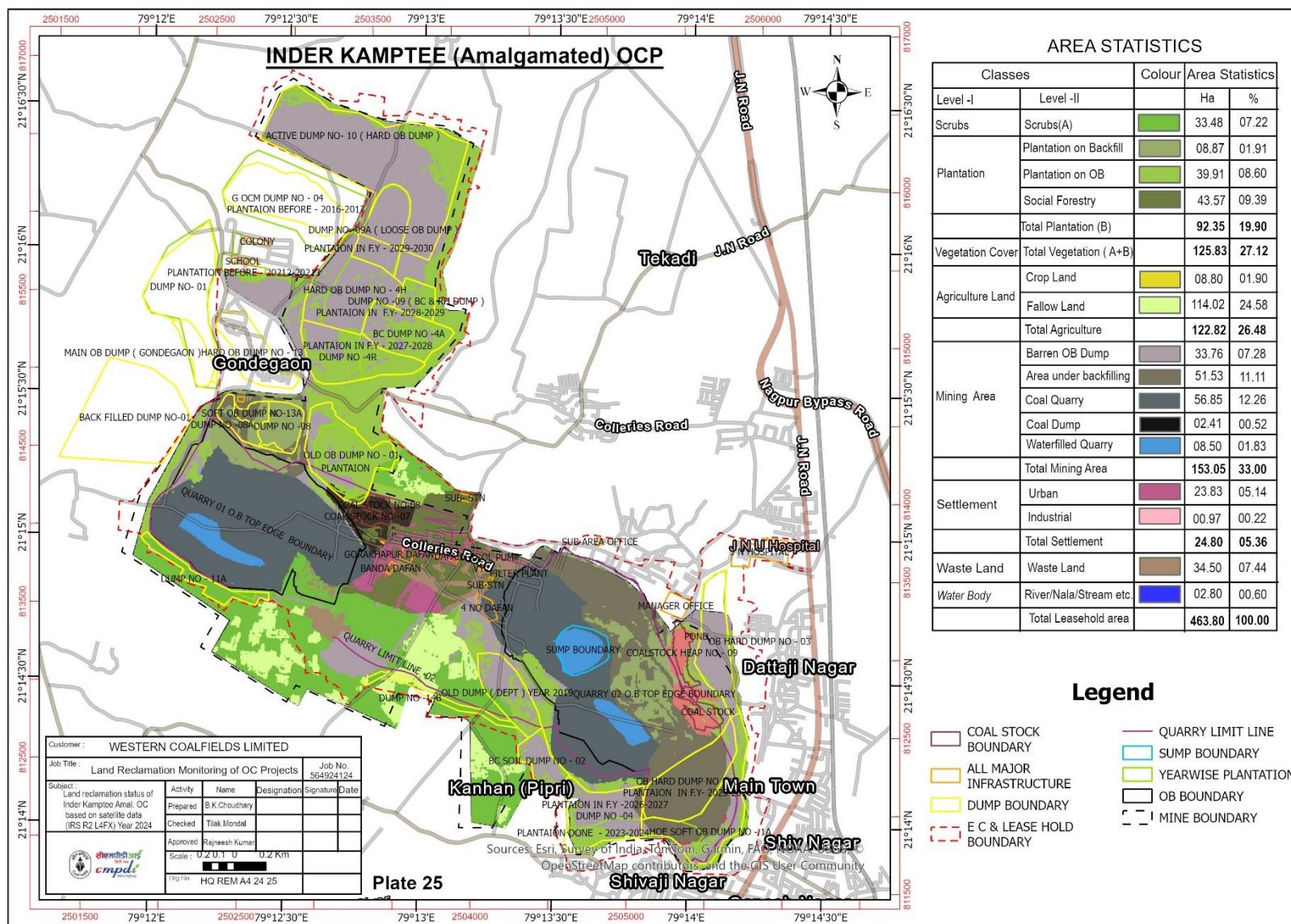


Plate 5-25: Land Use/Cover map of Inder Kamptee (Amalgamated) OCP

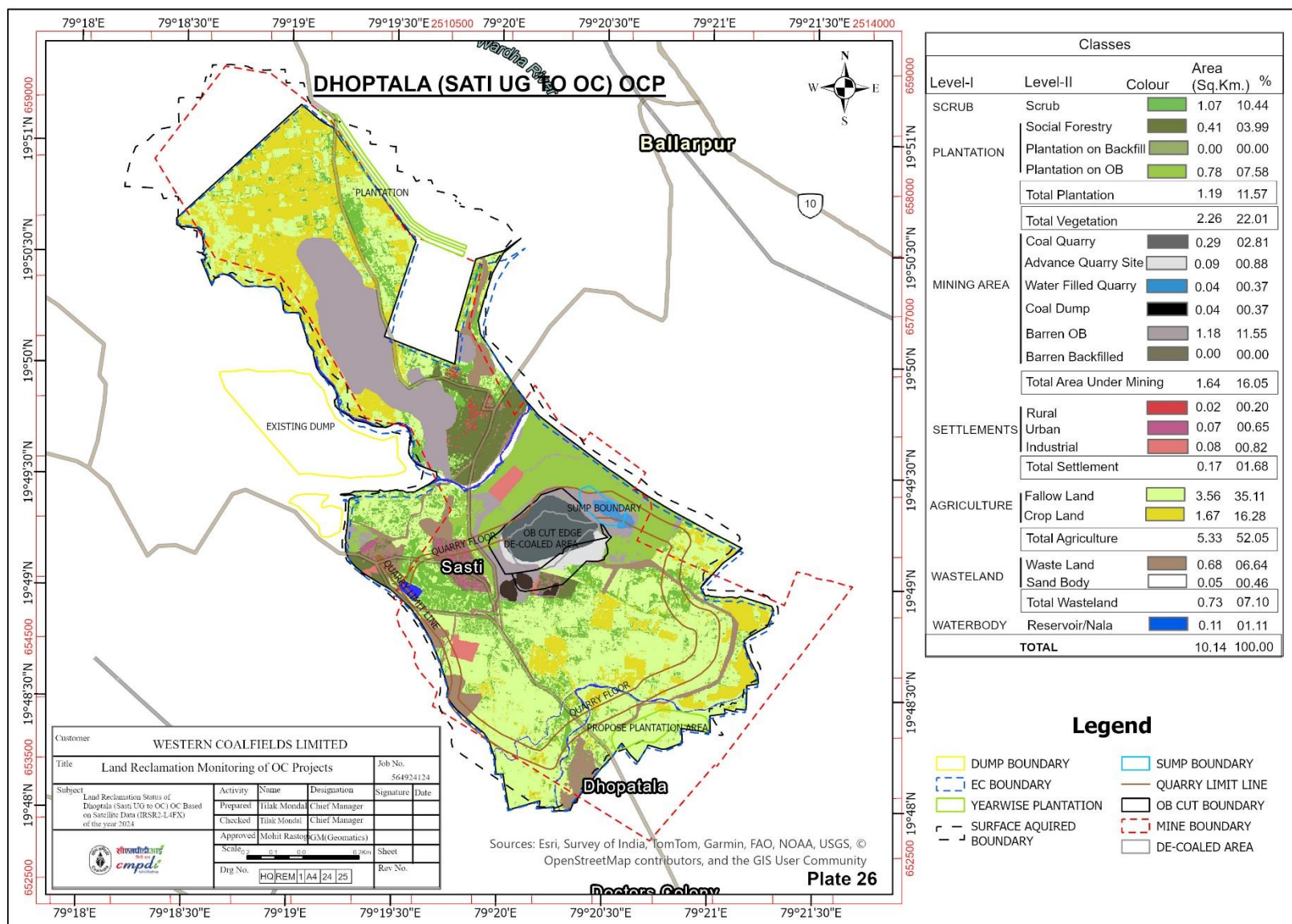


Plate 5-26: Land Use/Cover map of Dhoptala (Sati UG to OC) OCP

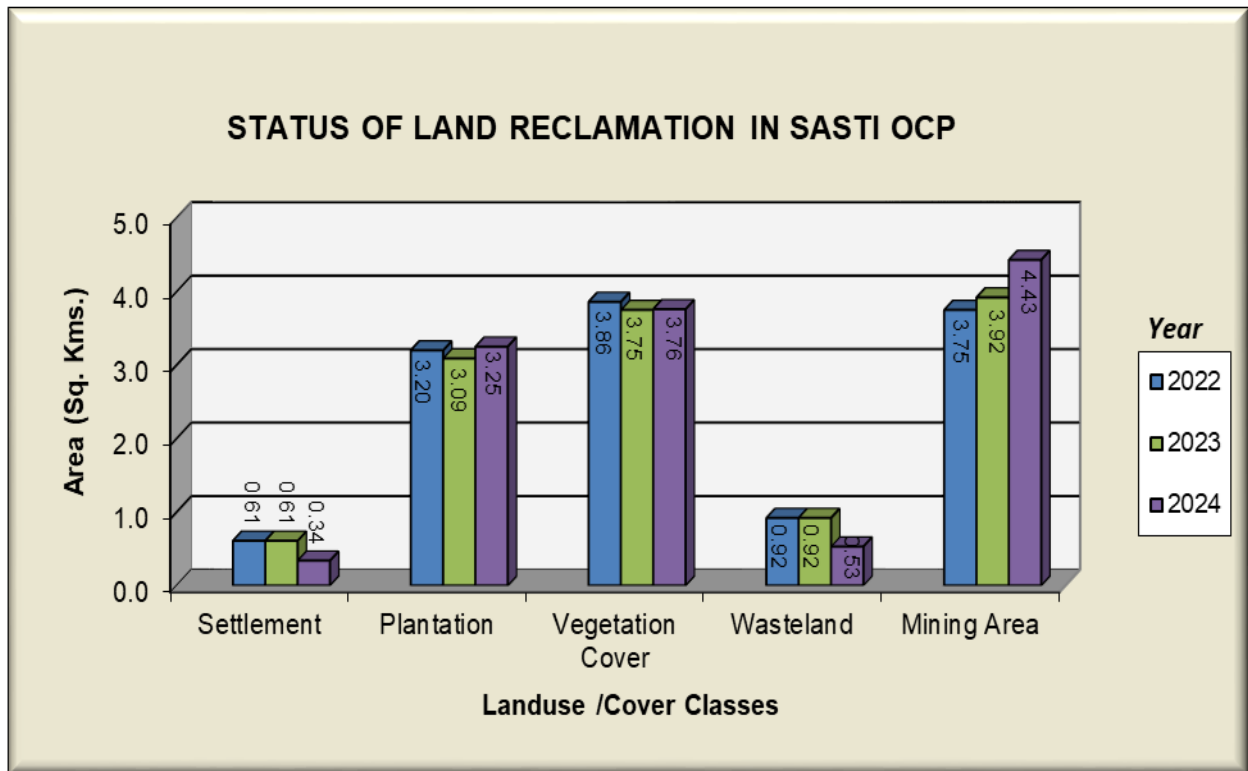


Chart 5.2: Status of Land Reclamation in Sasti OCP

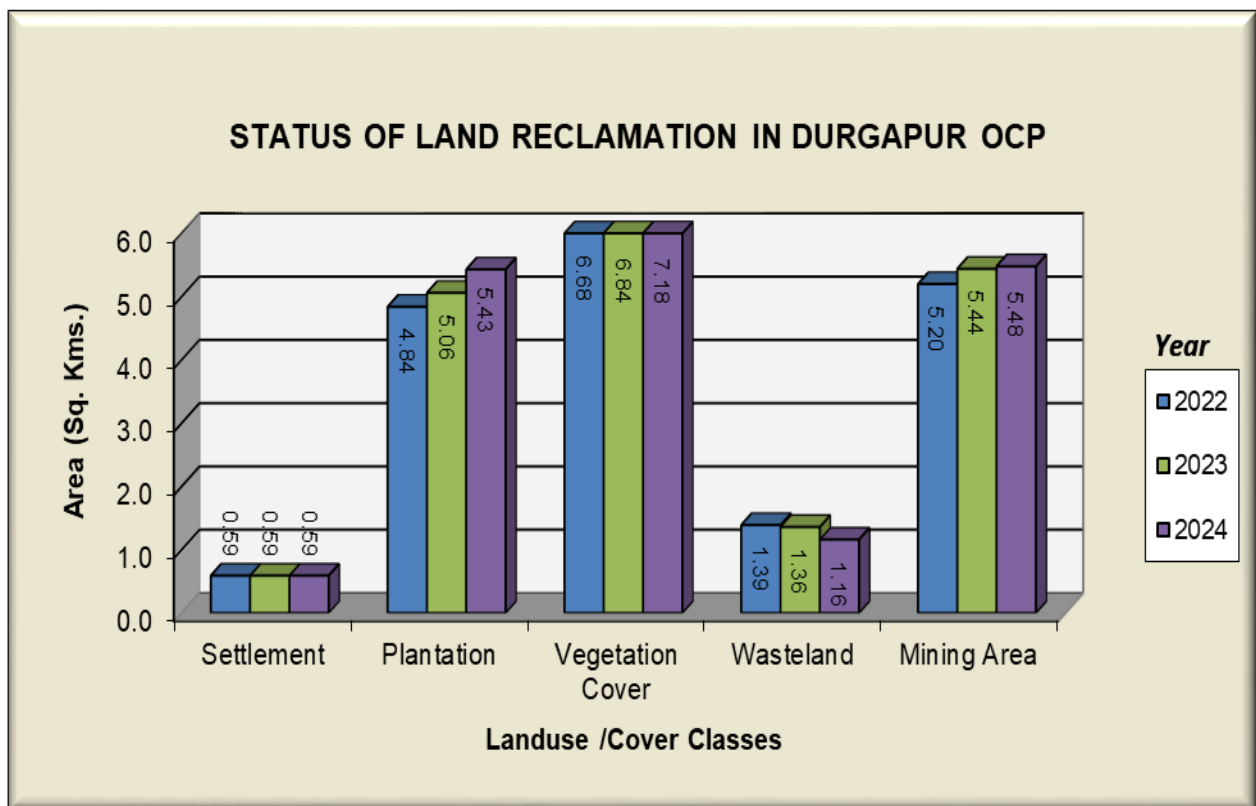


Chart 5.3: Status of Land Reclamation in Durgapur OCP

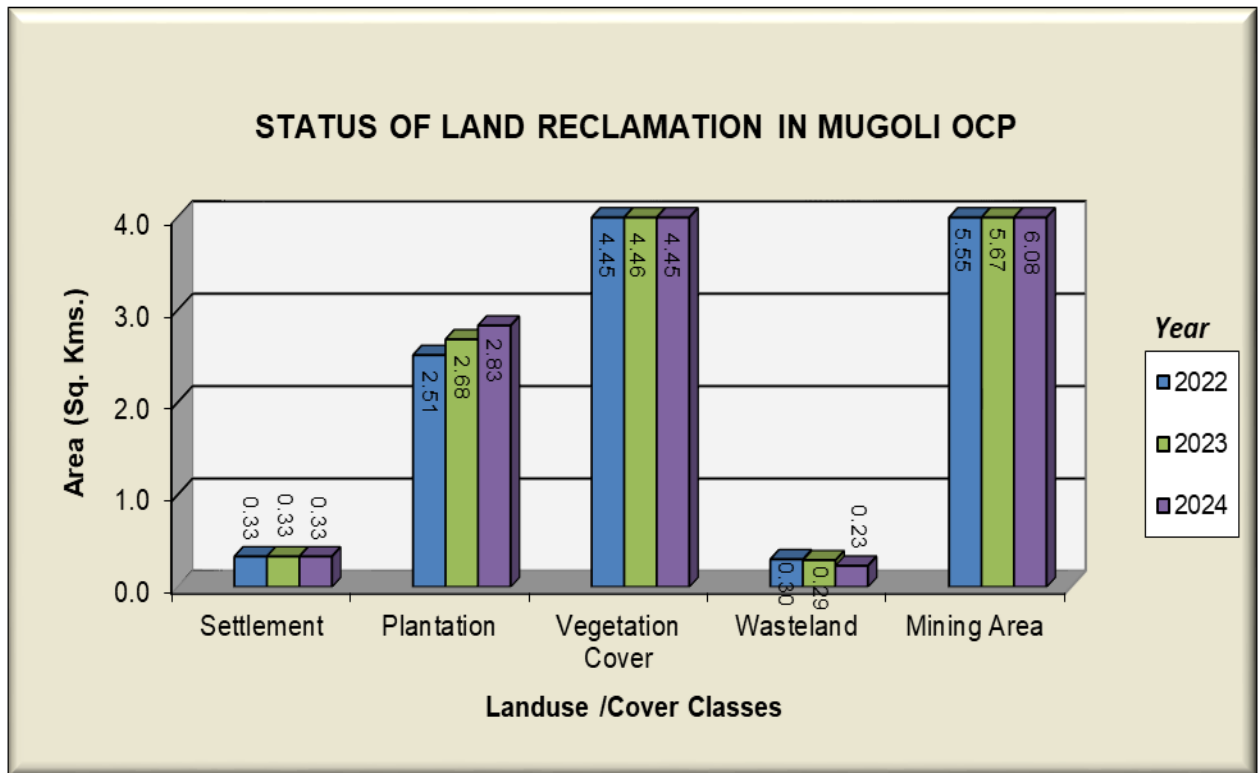


Chart 5.4: Status of Land Reclamation in Mugoli OCP

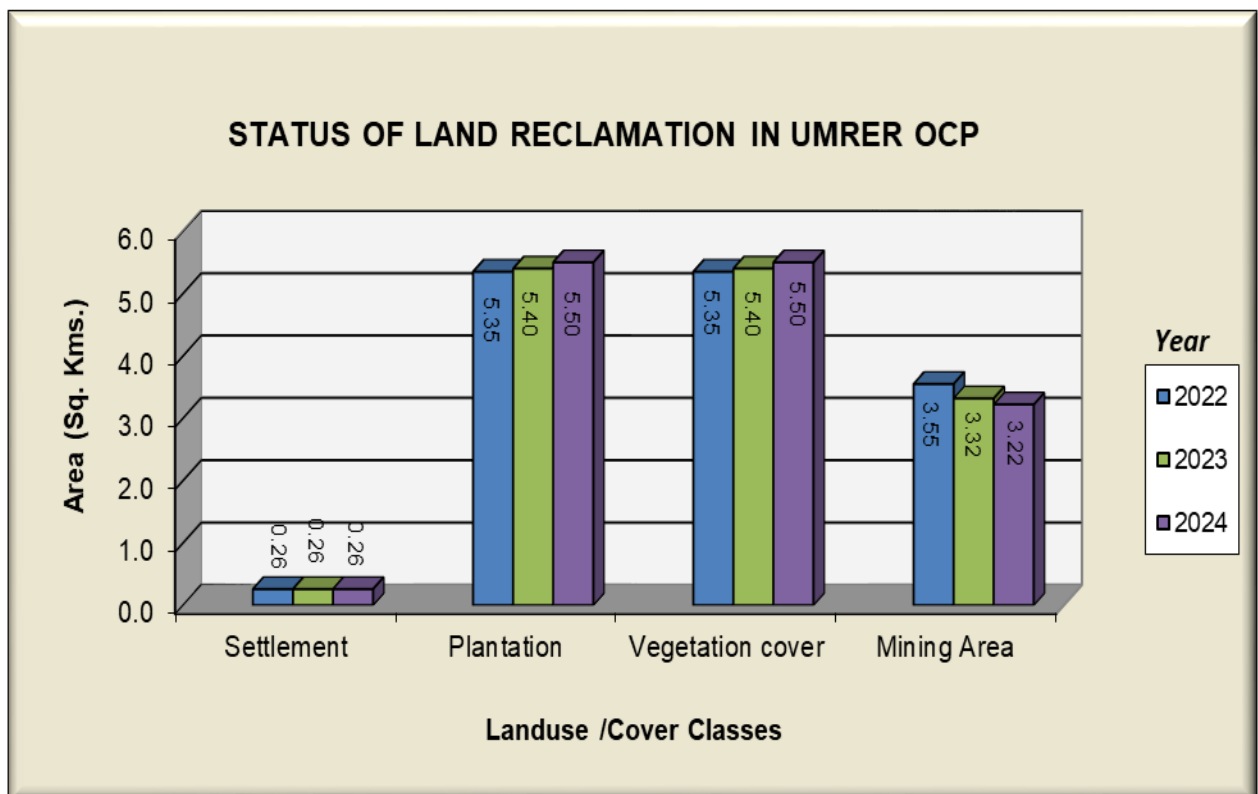


Chart 5.5: Status of Land Reclamation in Umrer OCP

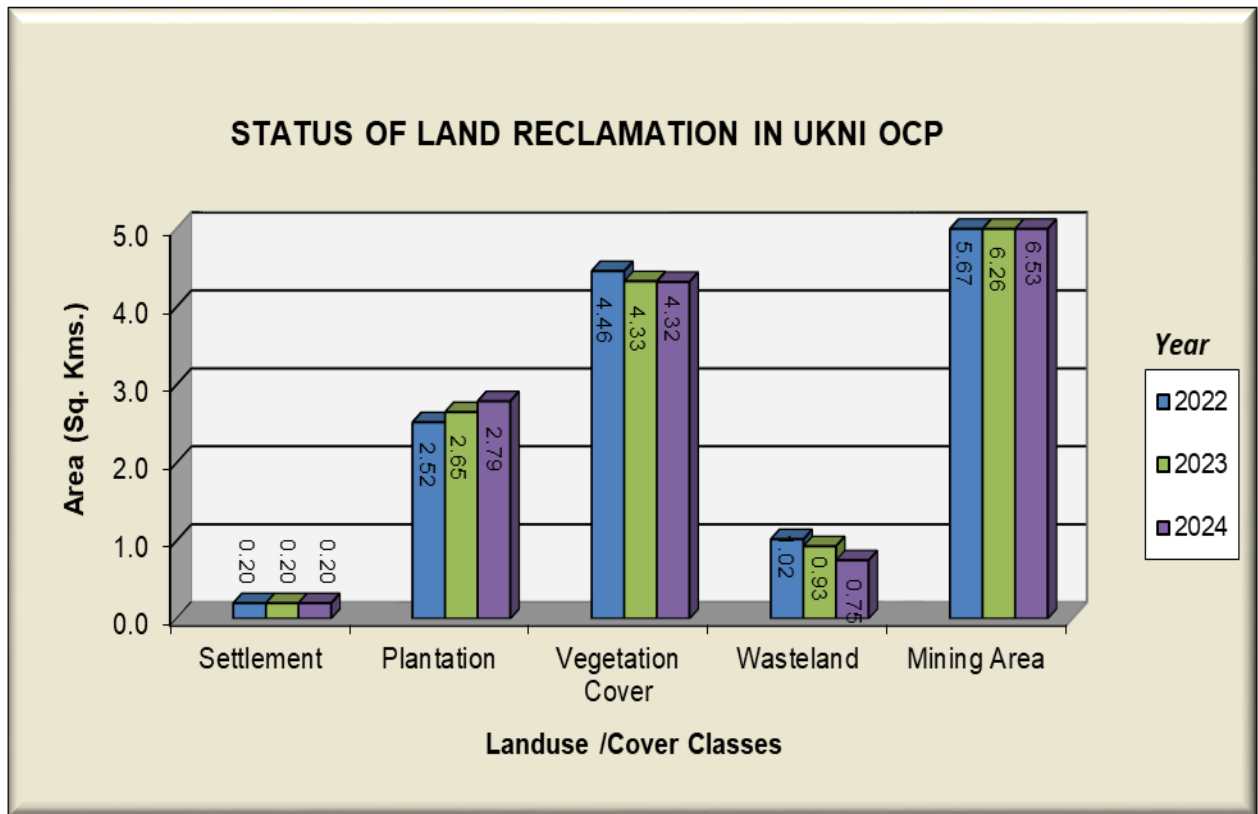


Chart 5.6: Status of Land Reclamation in Ukni OCP

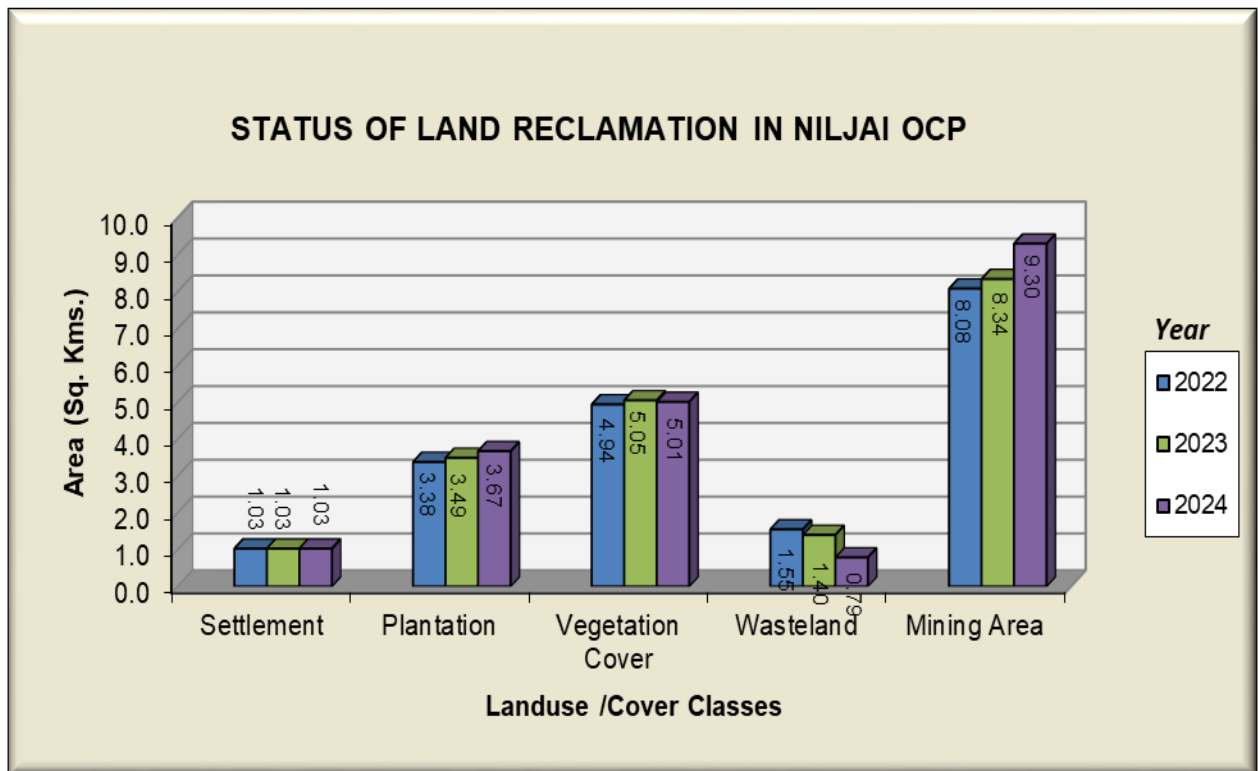


Chart 5.7: Status of Land Reclamation in Niljai OCP

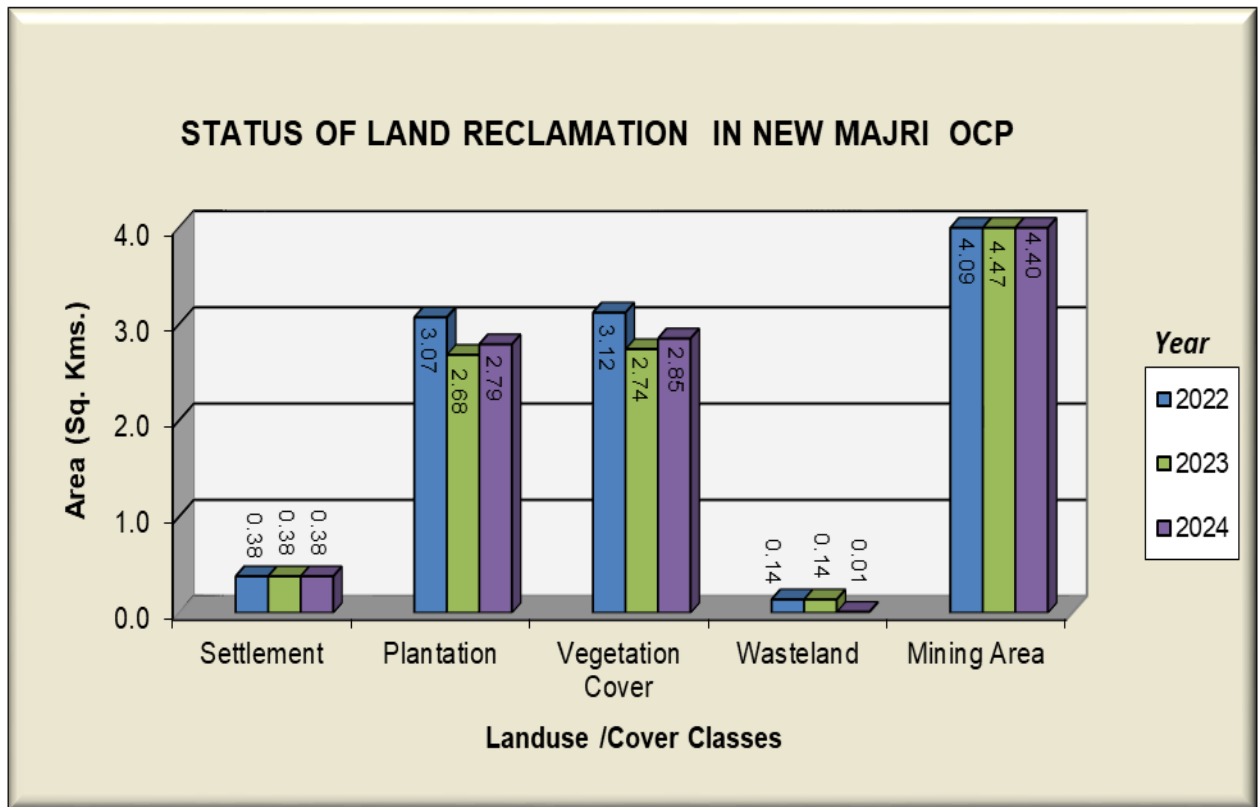


Chart 5.8: Status of Land Reclamation in New Majri OCP

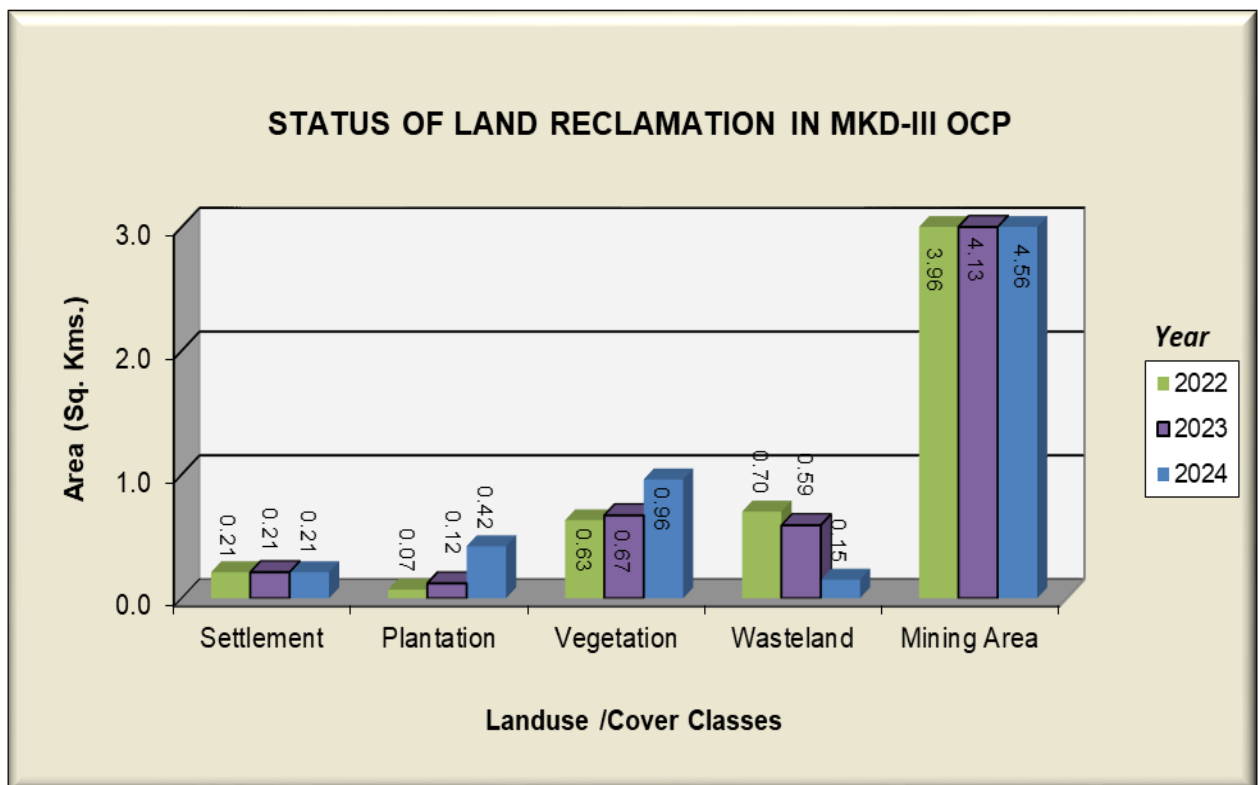


Chart 5.9: Status of Land Reclamation in MKD-III OCP

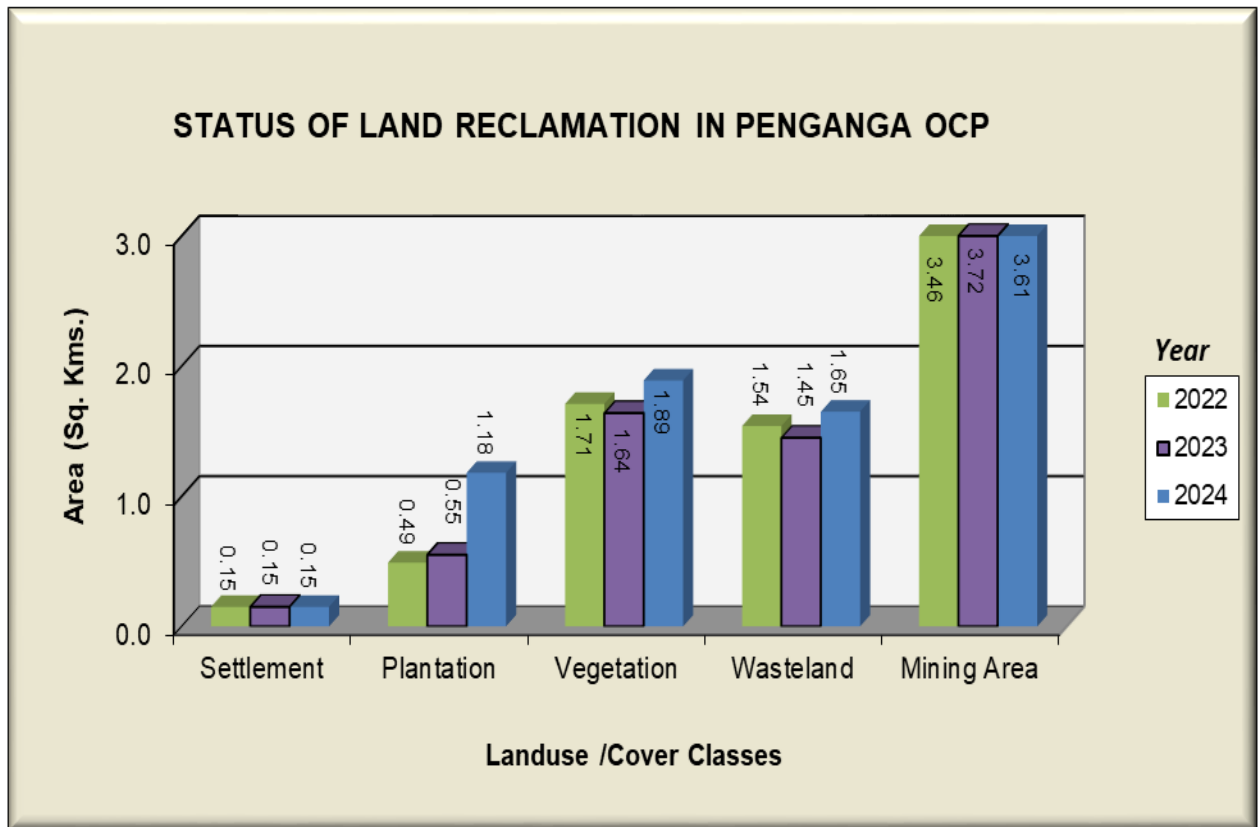


Chart 5.10: Status of Land Reclamation in Penganga OCP

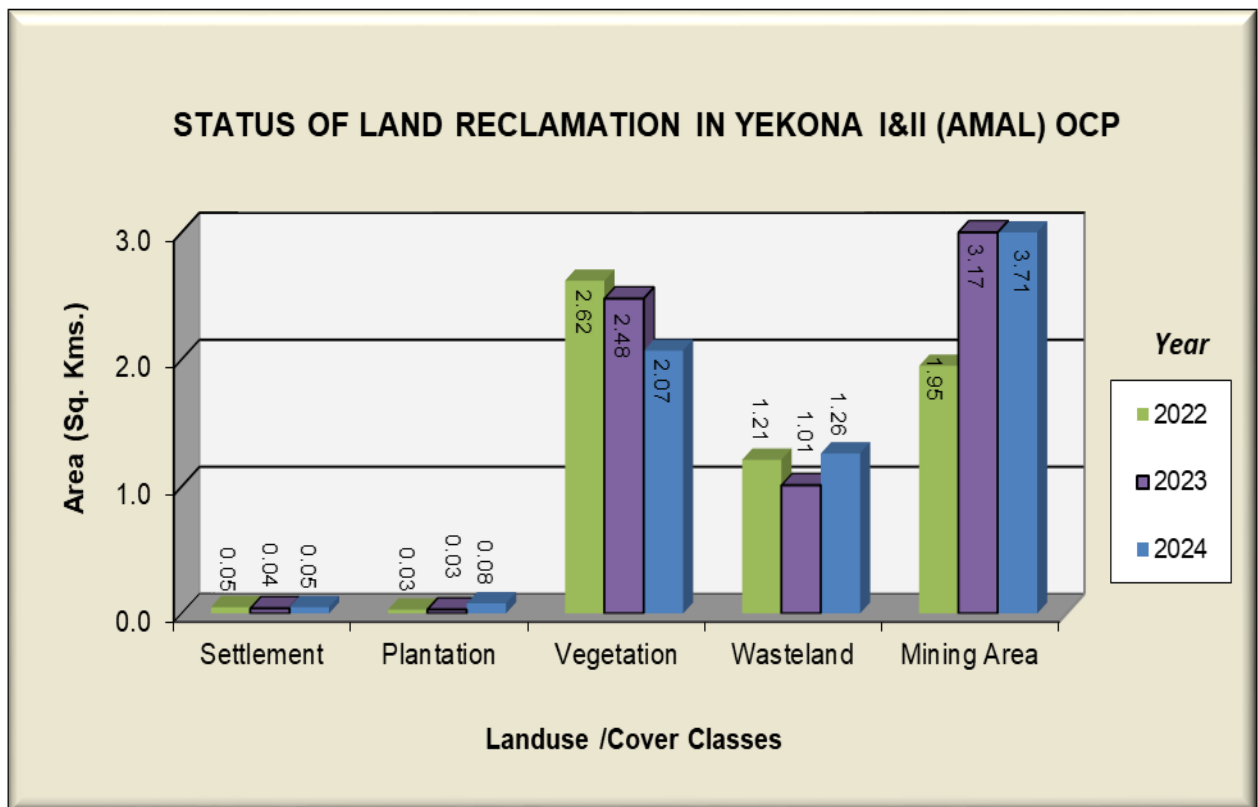


Chart 5.11: Status of Land Reclamation in Yekona I&II (Amal) OCP

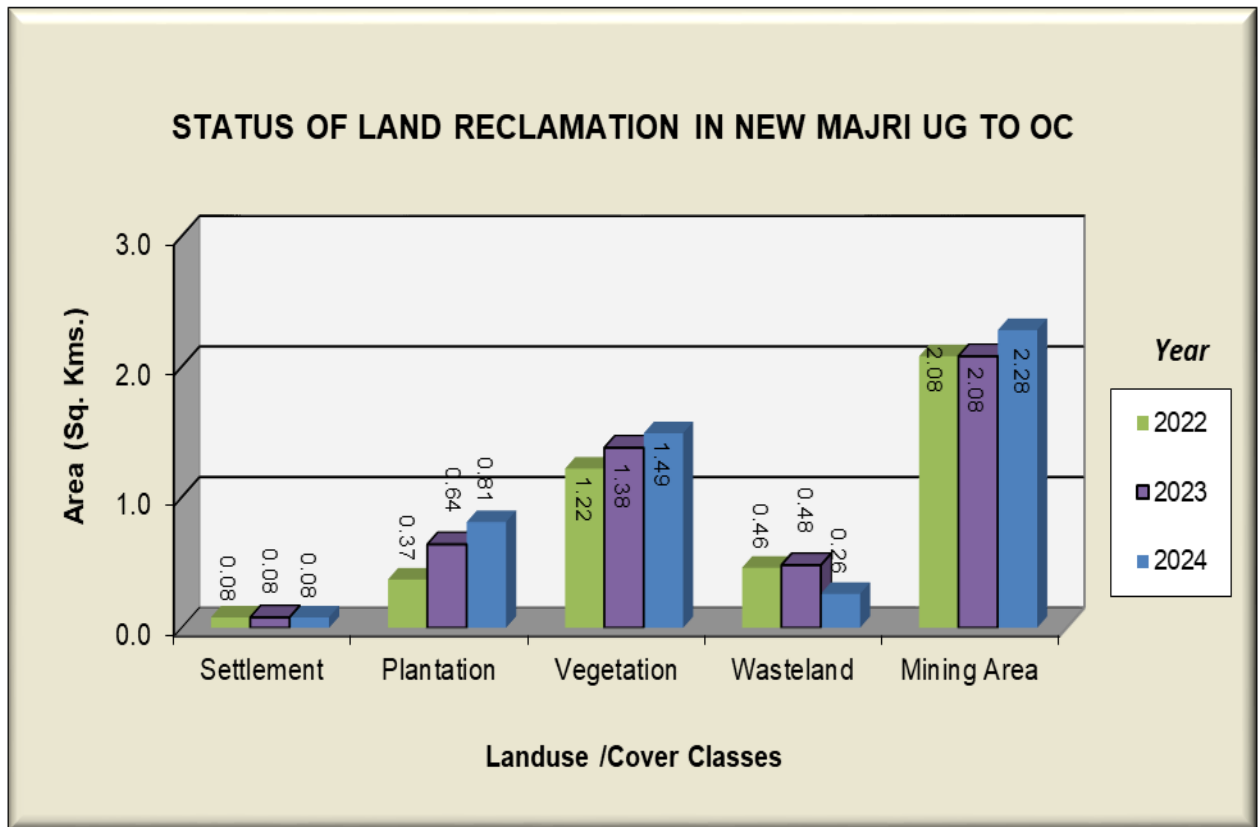


Chart 5.12: Status of Land Reclamation in Majri UG to OCP

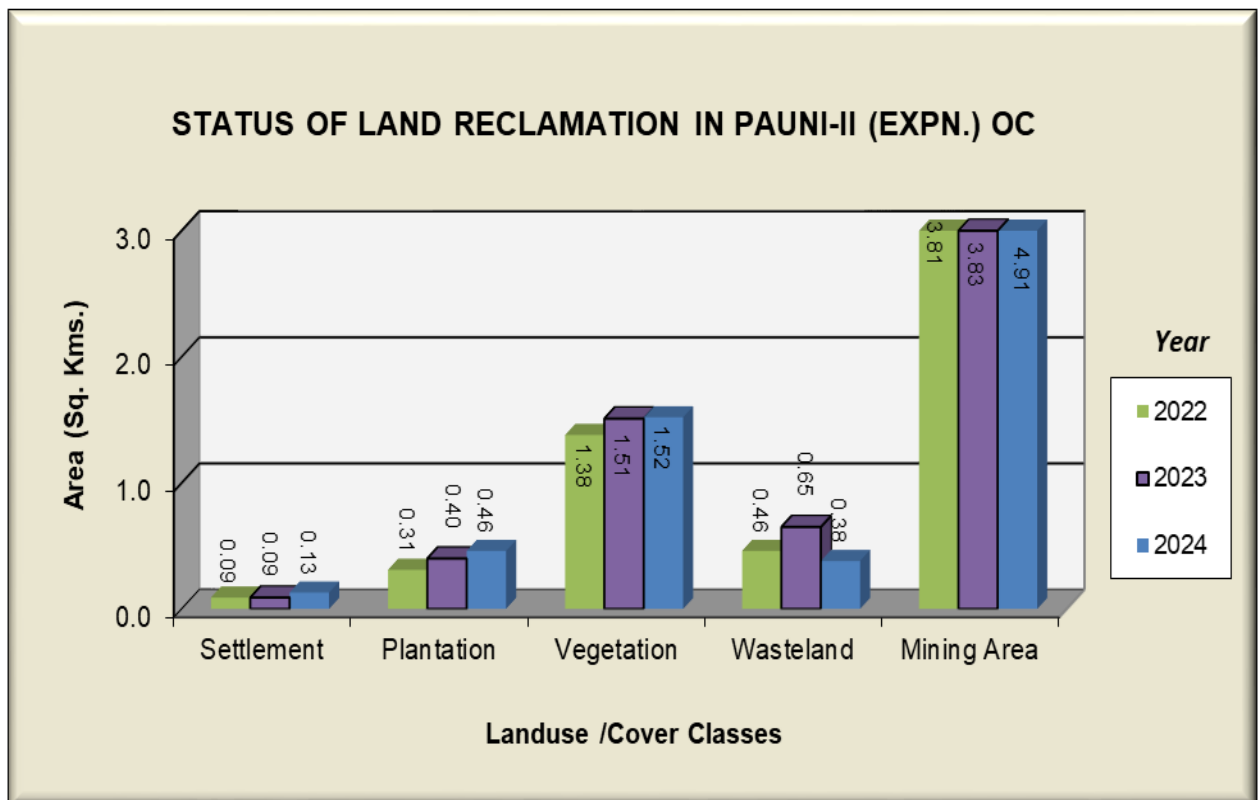


Chart 5.13: Status of Land Reclamation in Pauni-II(Expn.) OCP

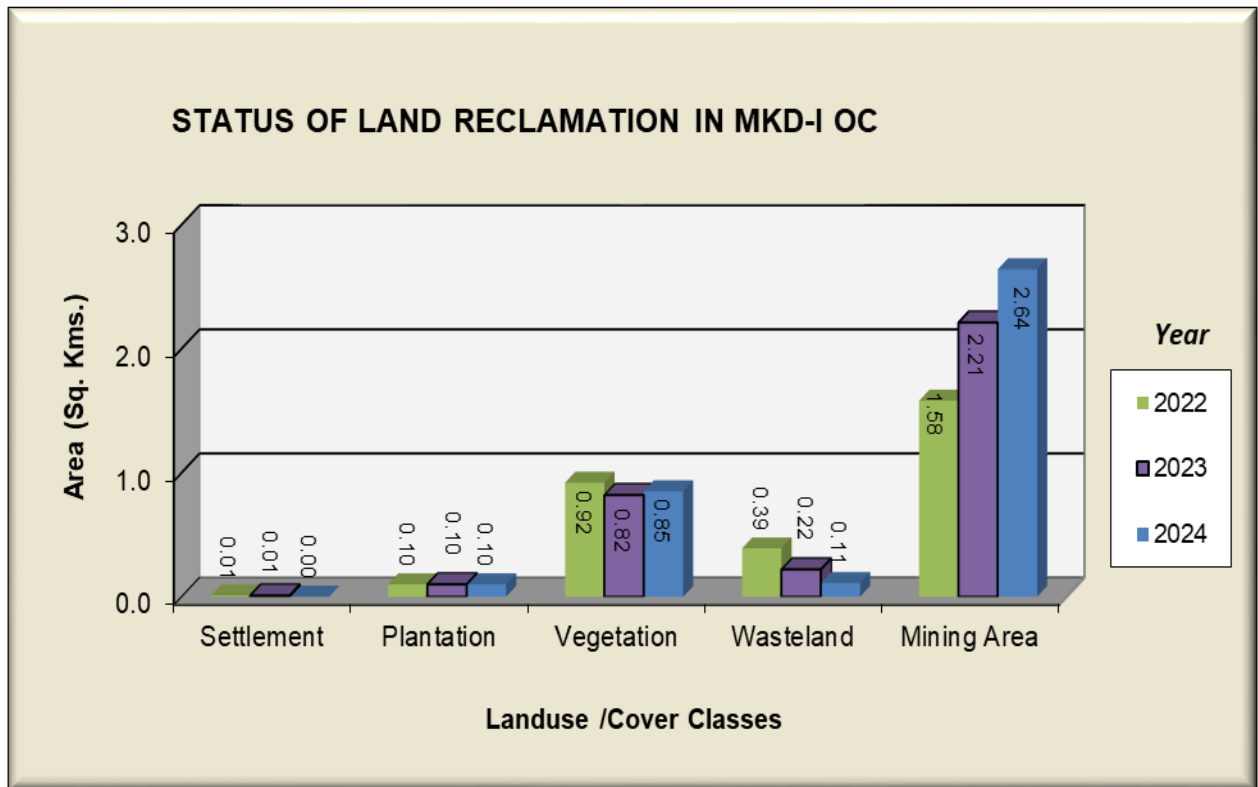


Chart 5.14: Status of Land Reclamation in MKD-I OCP

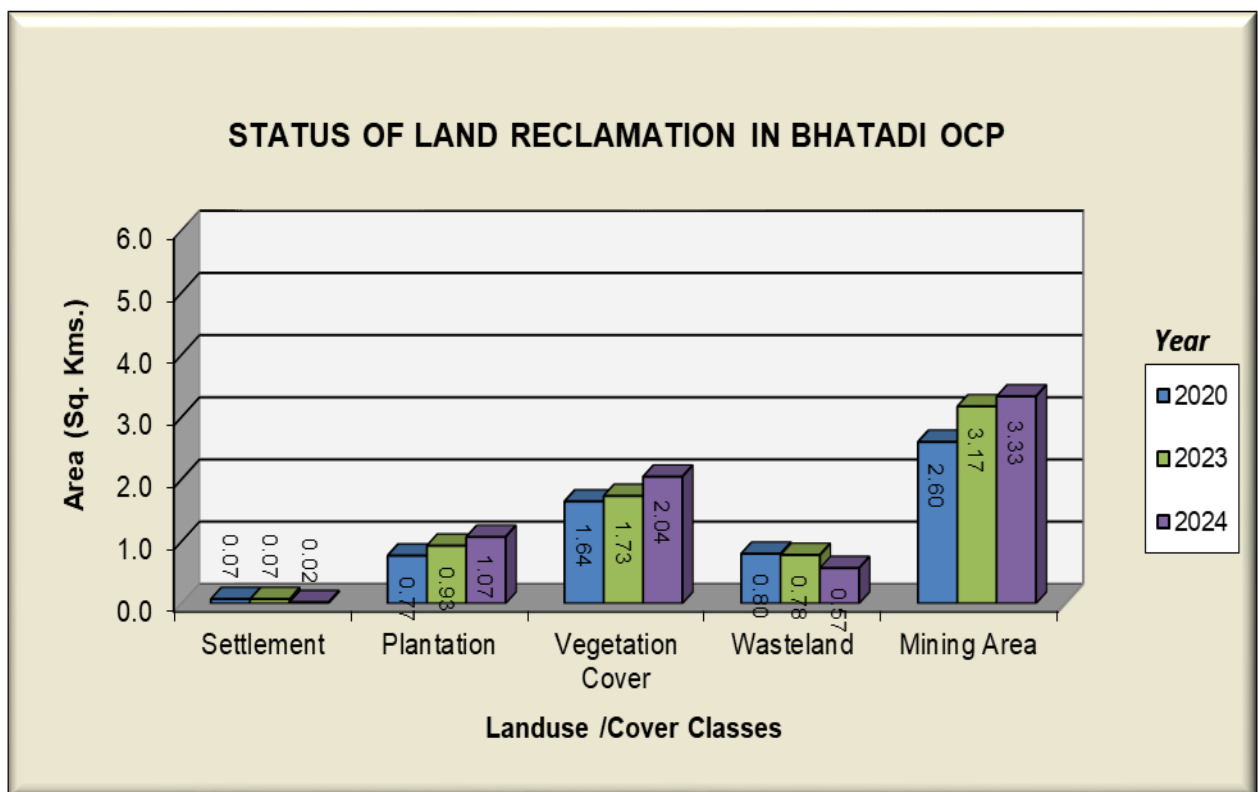


Chart 5.15: Status of Land Reclamation in Bhatadi OCP

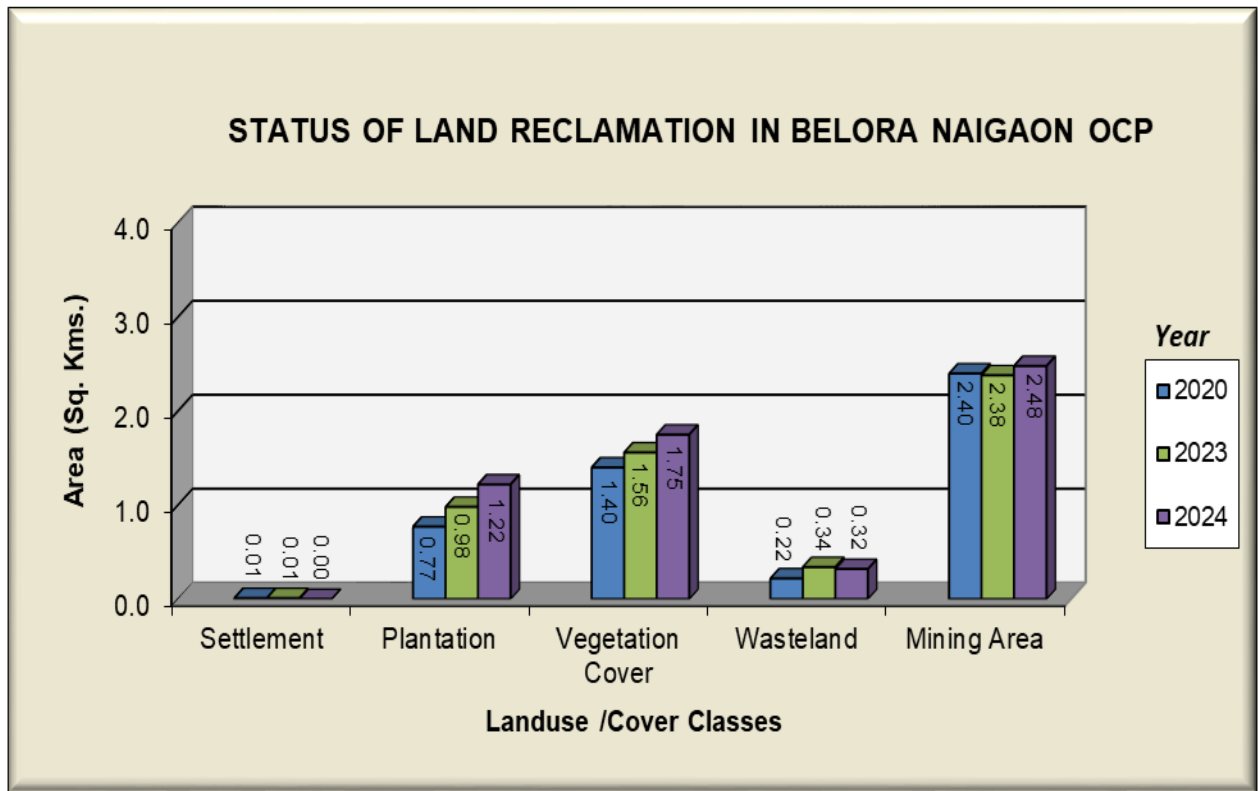


Chart 5.16: Status of Land Reclamation in Belora Naigaon OCP

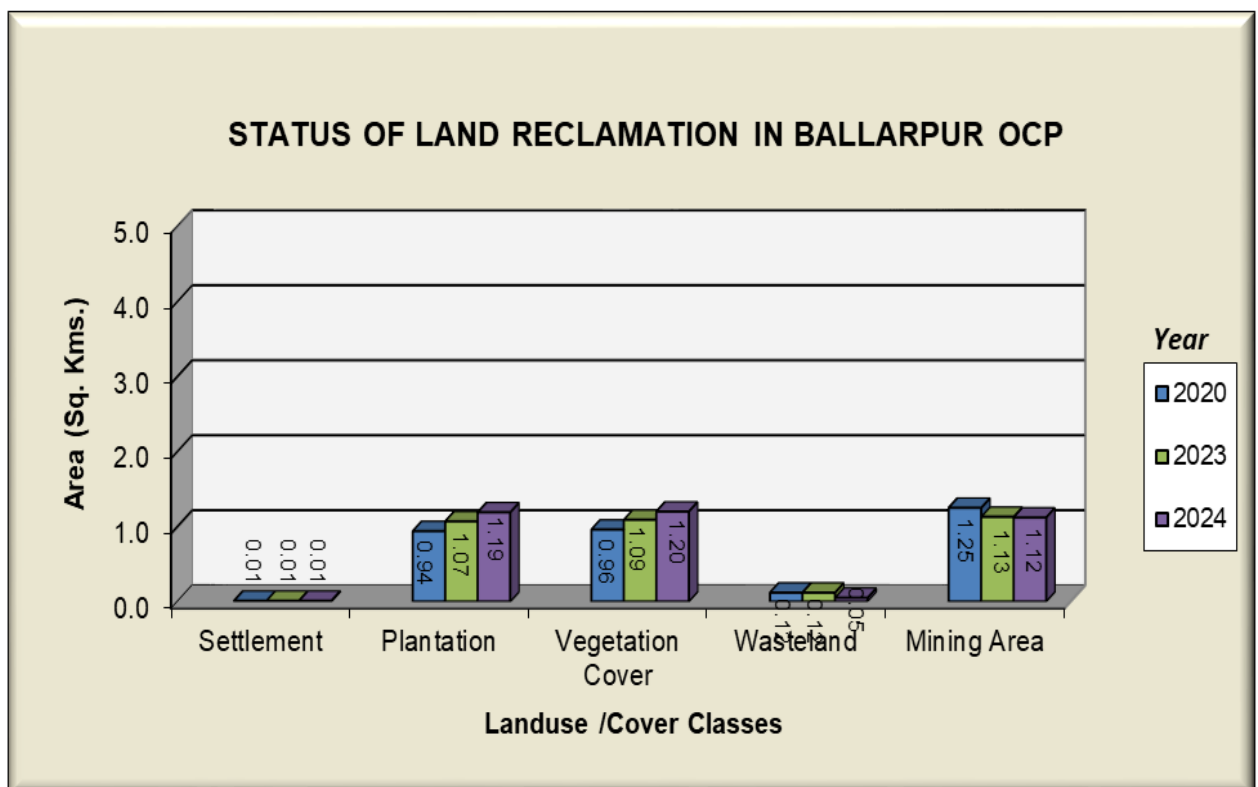


Chart 5.17: Status of Land Reclamation in Ballarpur OCP

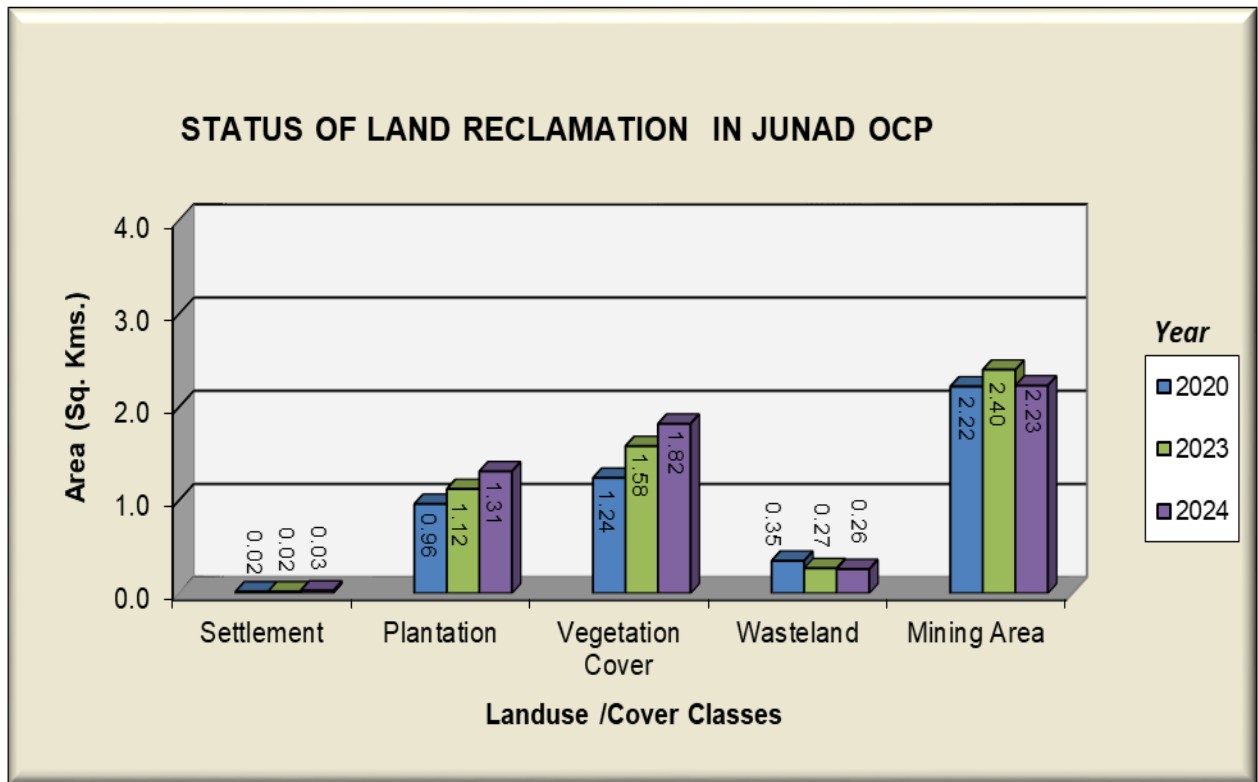


Chart 5.18: Status of Land Reclamation in Junad OCP

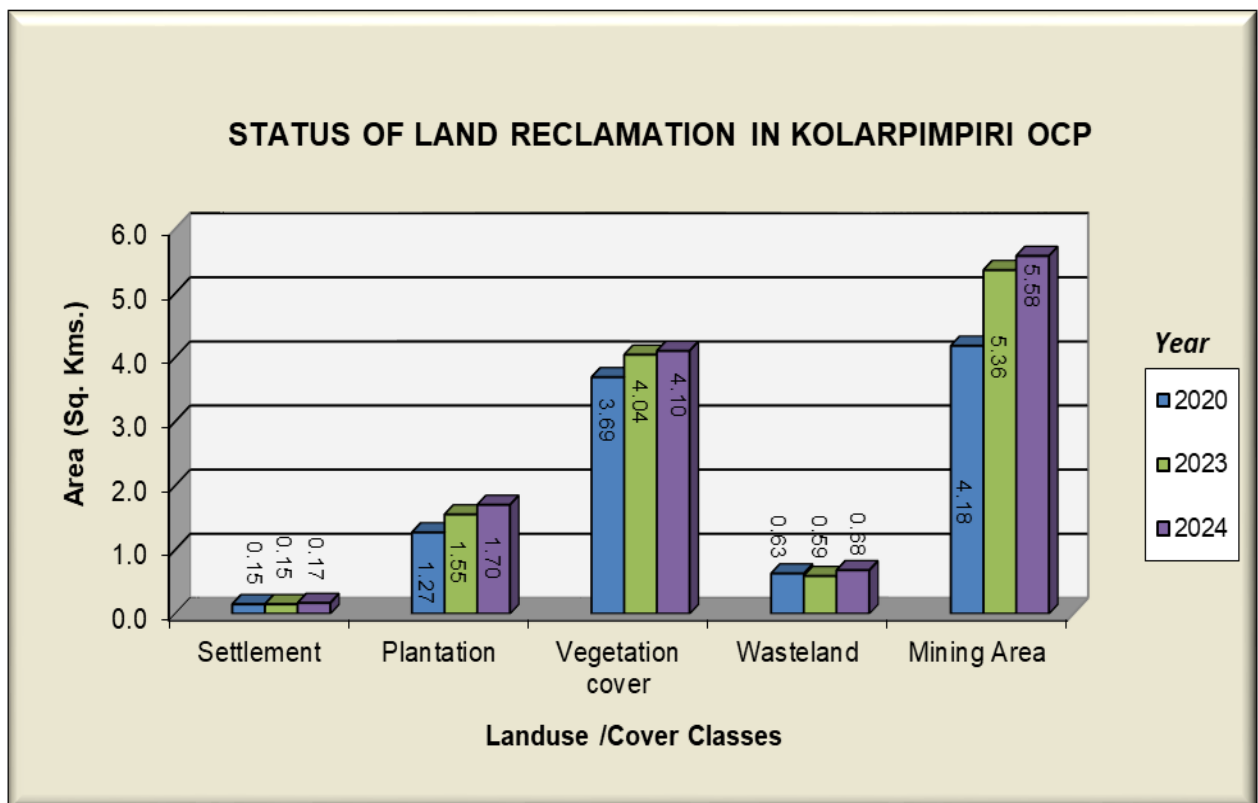


Chart 5.19: Status of Land Reclamation in Kolarpimpuri OCP

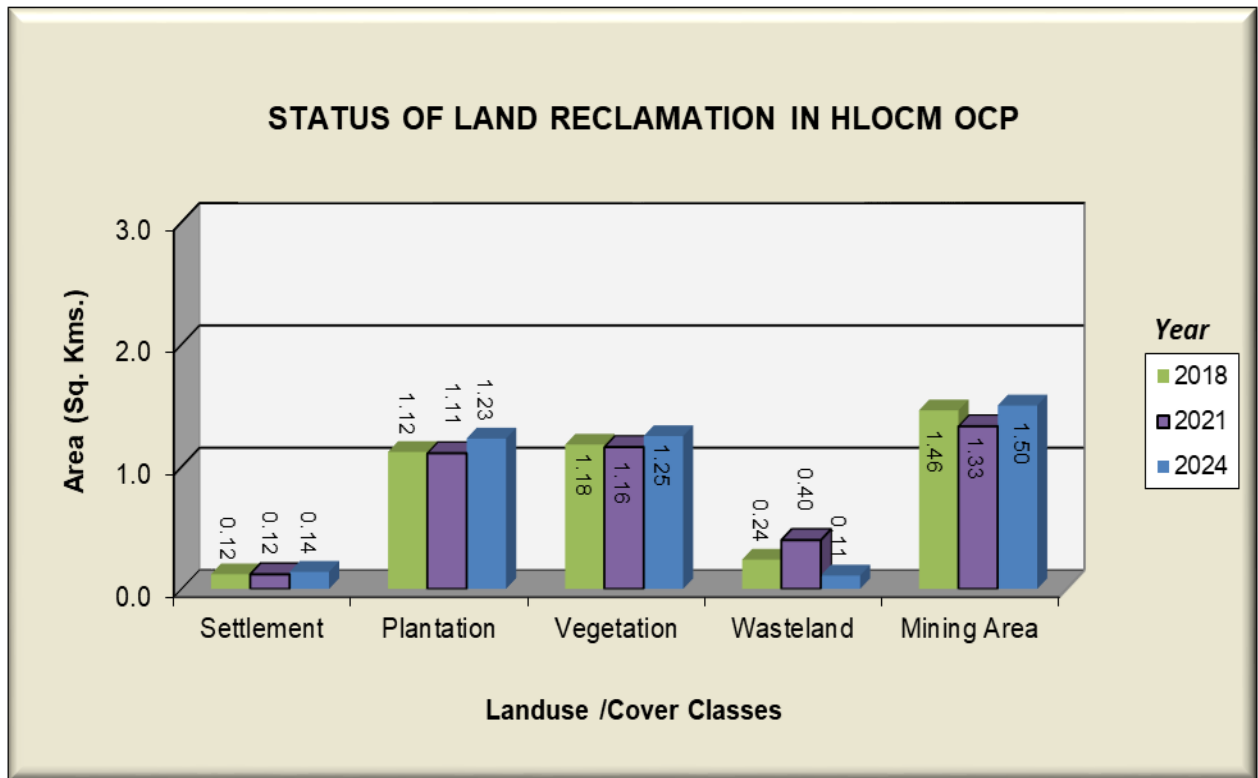


Chart 5.20: Status of Land Reclamation in HLOCM OCP

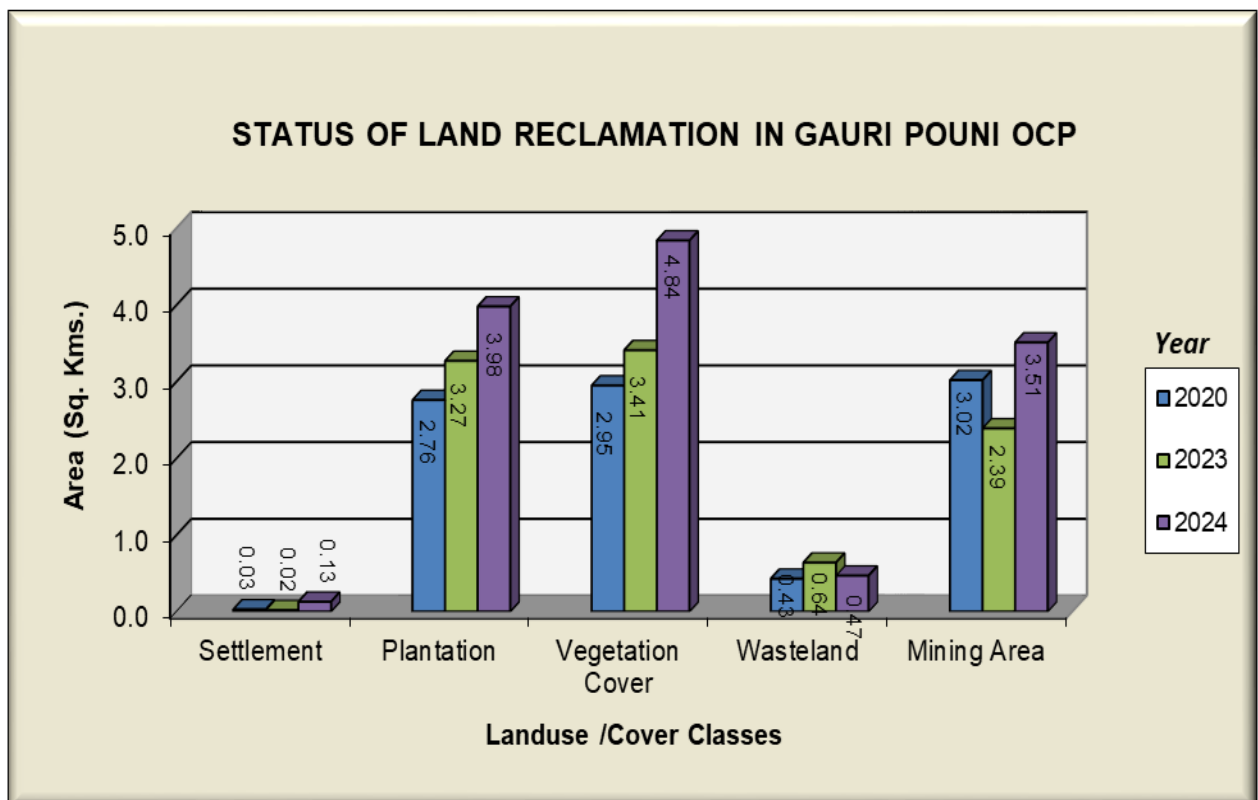


Chart 5.21: Status of Land Reclamation in Gauri Pouni OCP

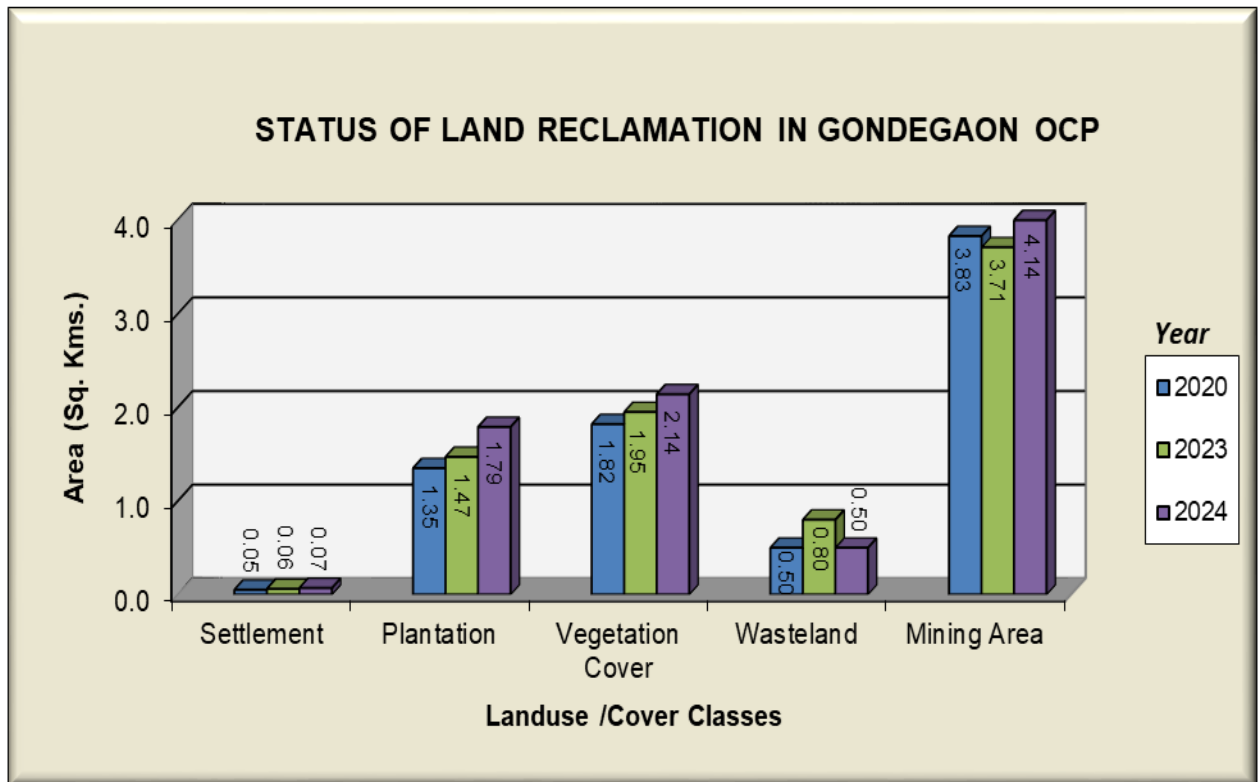


Chart 5.22: Status of Land Reclamation in Gondegaon OCP

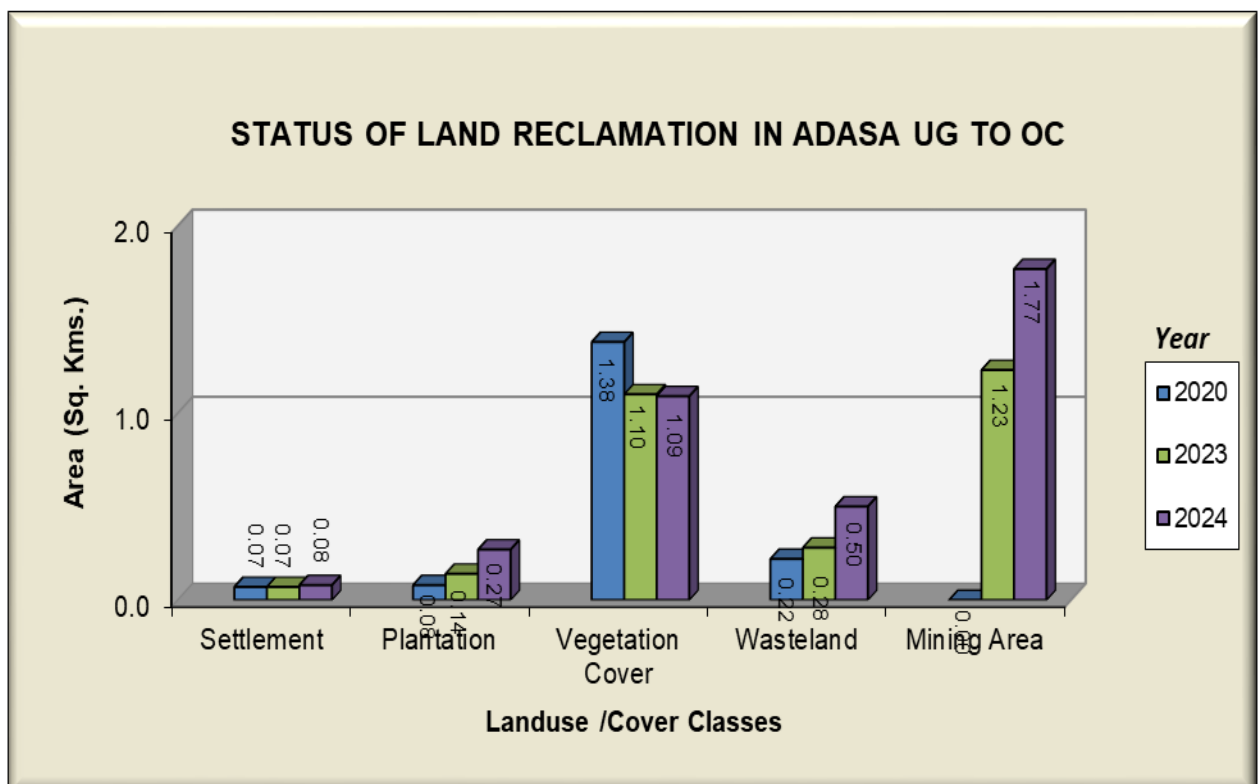


Chart 5.23: Status of Land Reclamation in Adasa UG to OCP

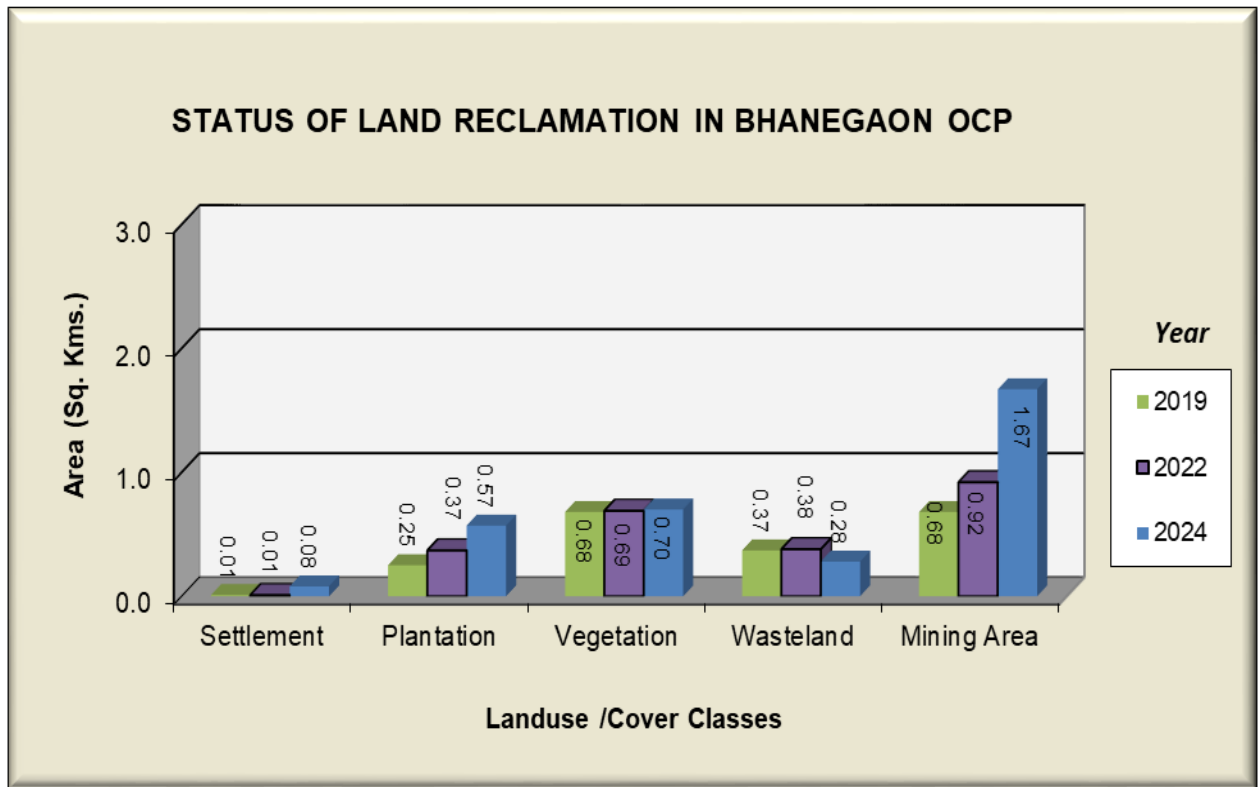


Chart 5.24: Status of Land Reclamation in Bhanegaon OCP

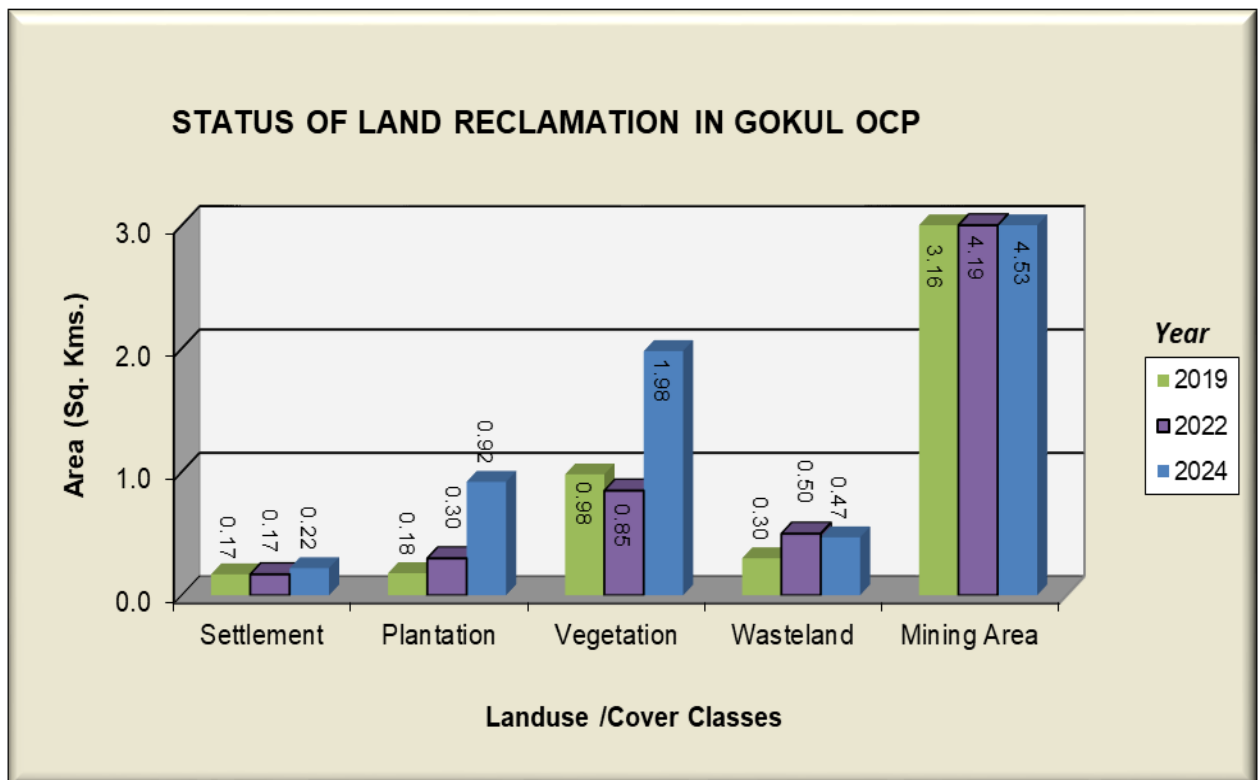


Chart 5.25: Status of Land Reclamation in Gokul OCP

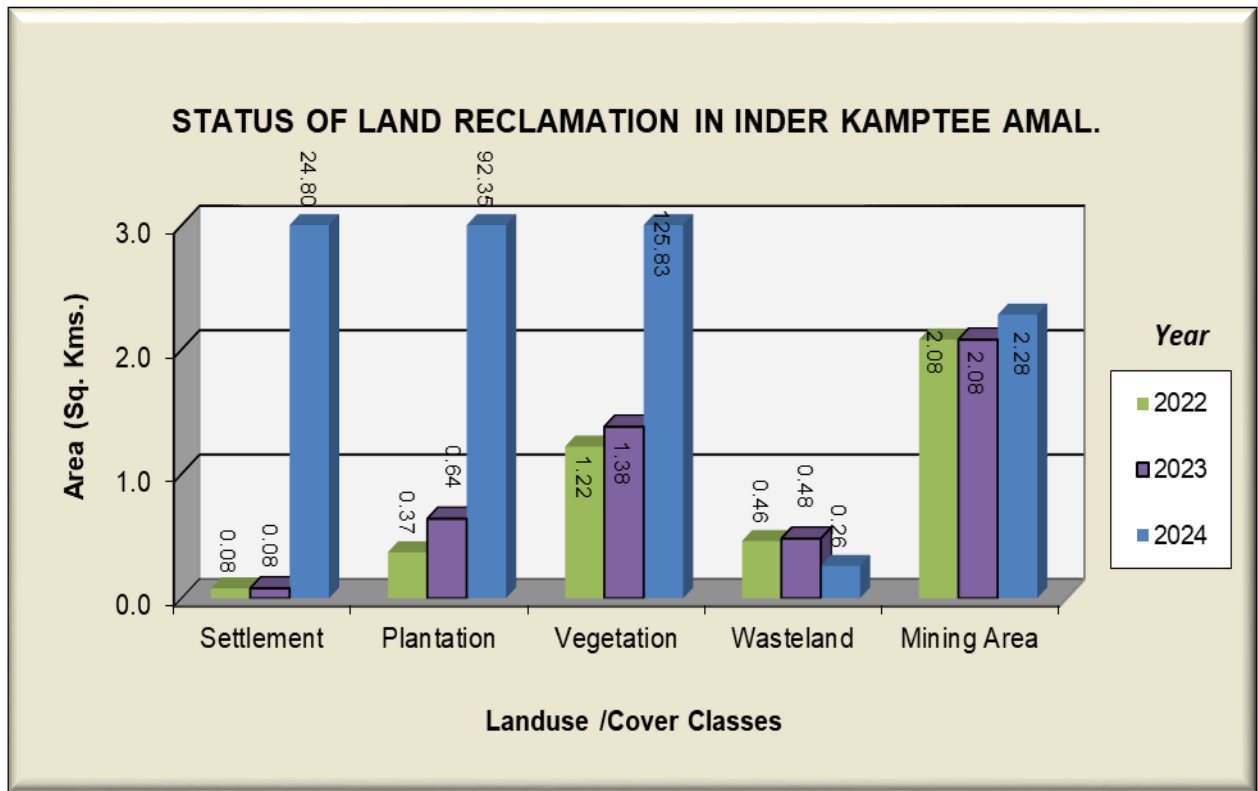


Chart 5.26: Status of Land Reclamation in Inder Kamptee Amal. OCP

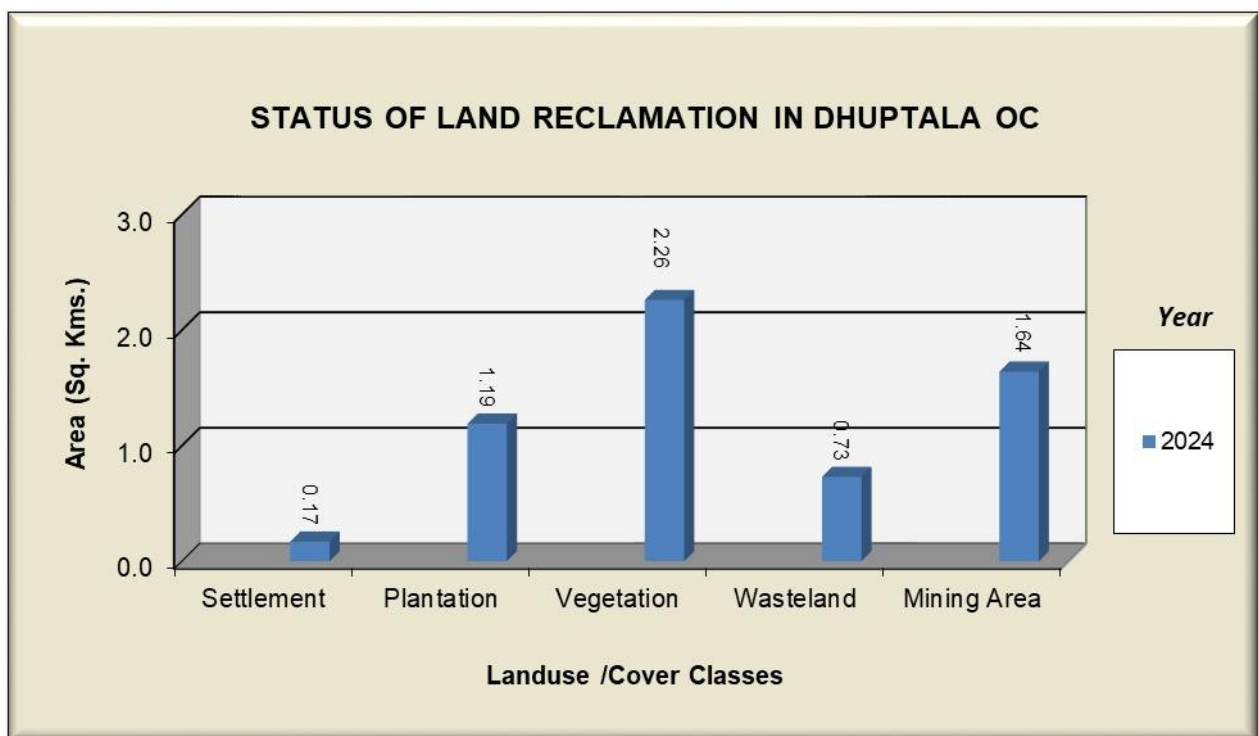


Chart 5.27: Status of Land Reclamation in Dhuptala OCP



Photo 5.1: Plantation on Internal OB/Backfill (Sasti OCP)



Photo 5.2: Avenue Plantation (Durgapur OCP)



Photo 5.3: Plantation on External OB dump (Mungoli OCP)

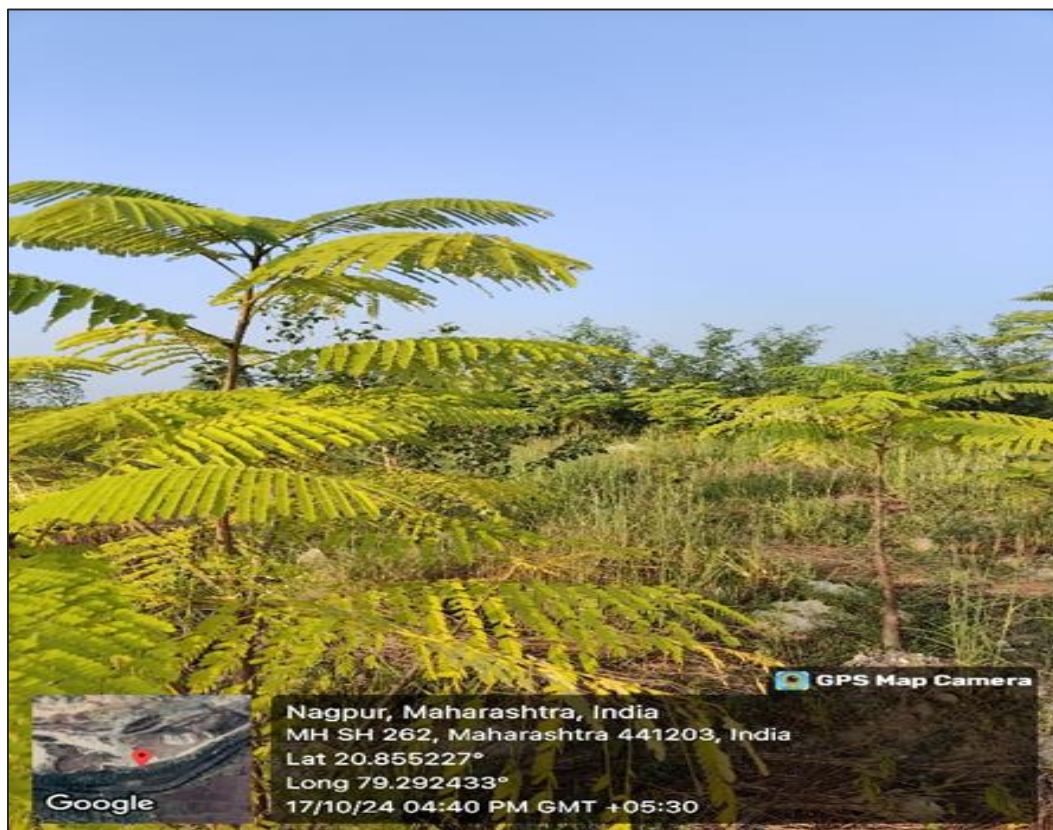


Photo 5.4: Avenue Plantation (Umrer OCP)



Photo 5.5: Plantation on OB Dump (Ukni OCP)



Photo 5.6: Plantation on Internal OB dump (Niljai OCP)

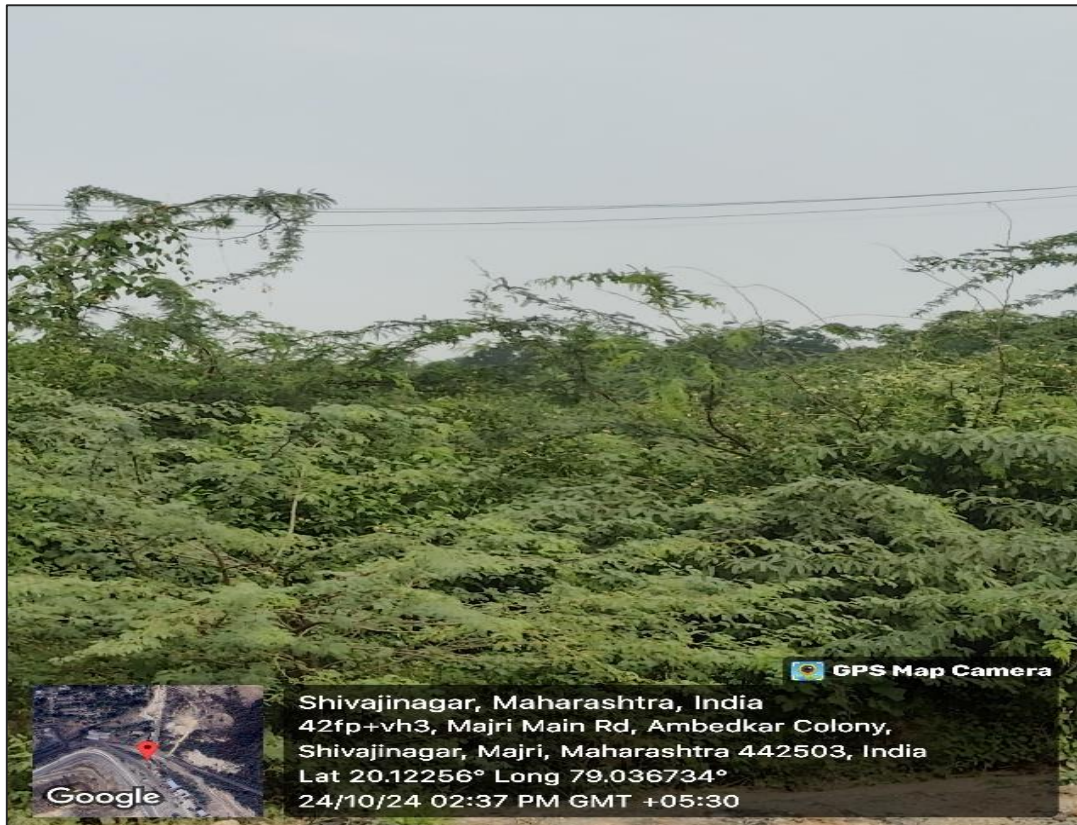


Photo 5.7 : Plantation on External OB dump (New Majri OCP)



Photo 5.8: Social Forestry (MKD-III OCP)



Photo 5.9: Plantation on Embankment (Penganga OCP)

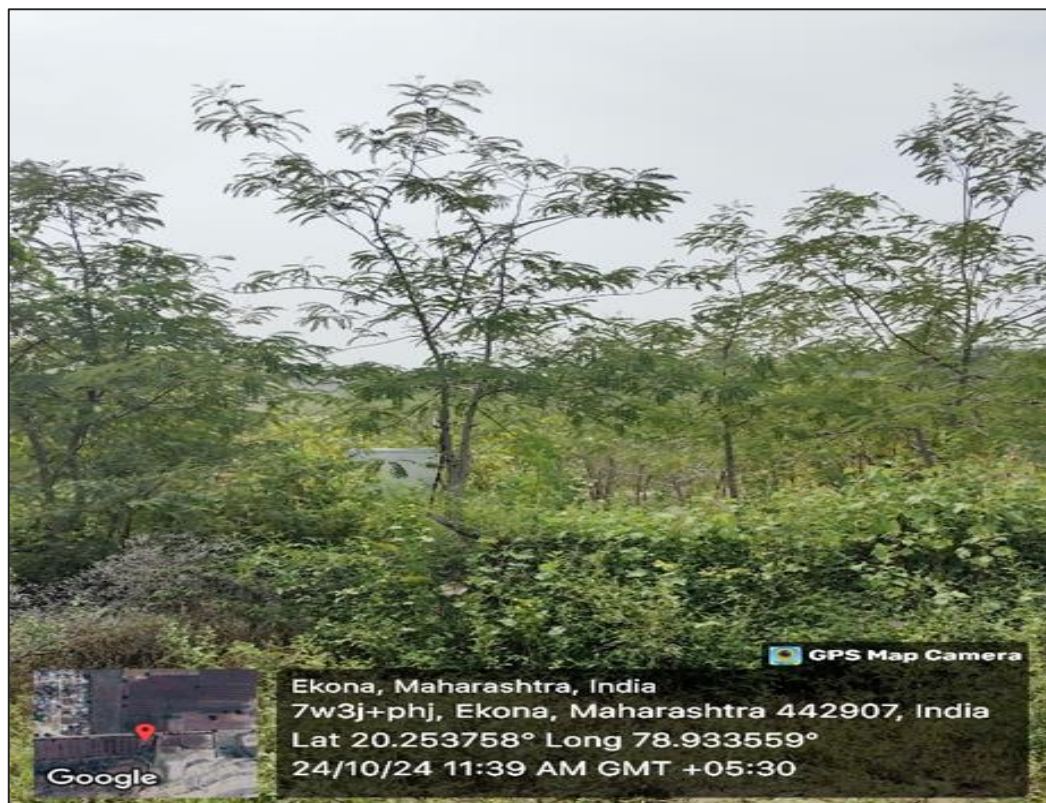


Photo 5.10: Plantation on OB dump (Yekona I&II OC)



Photo 5.11: Avenue Plantation NewMajri UG to OC

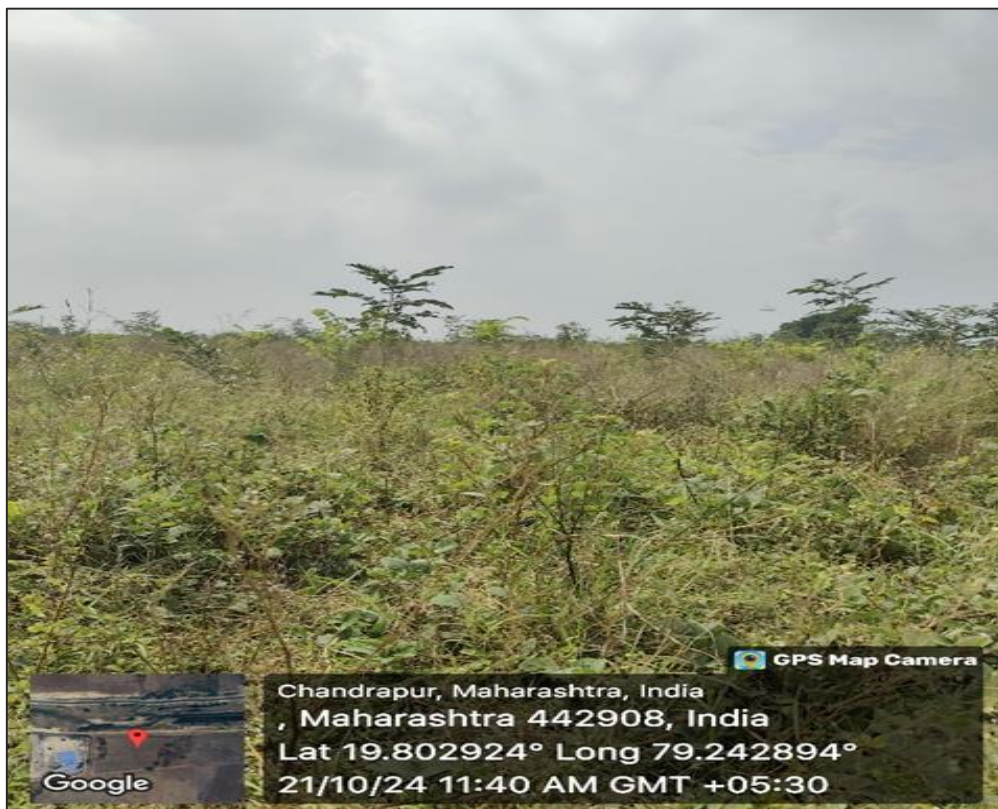


Photo 5.12: Social Forestry (Pauni-II OCP)



Photo 5.13: Social Forestry (MKD-I OC)



Photo 5.14: Social Forestry (Bhatadi OCP)



Photo 5.15: Social Forestry (Belora Naigaon OCP)



Photo 5.16: Social Forestry (Ballarpur OCP)



Photo 5.17: Social Forestry (Kolarpimpiri OCP)

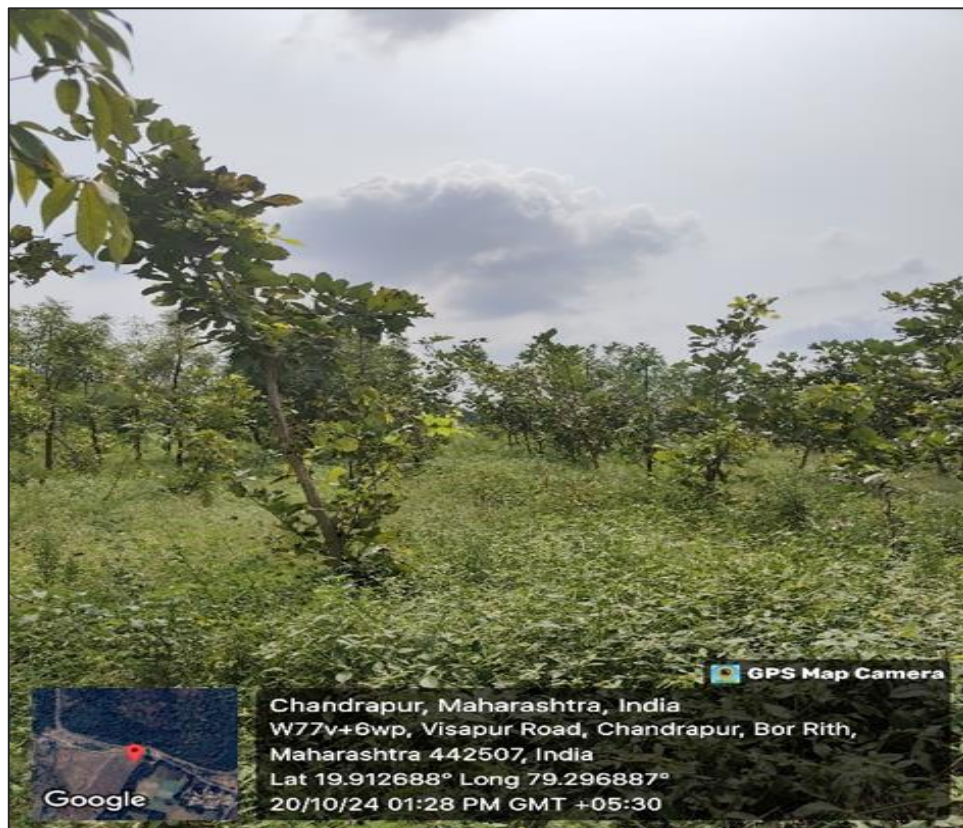


Photo 5.18: Social Forestry (HLOCM OCP)

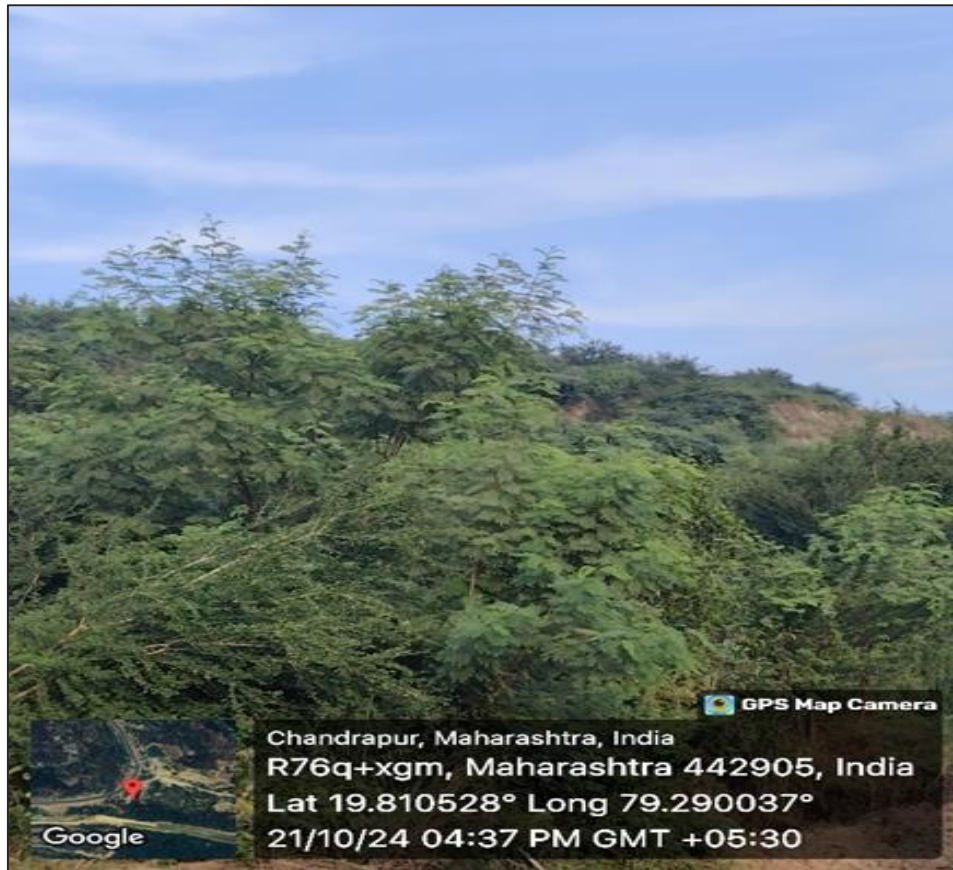


Photo 5.19: Social Forestry (Gauri Pauni OCP)



Photo 5.20: Social Forestry (Gondegaon OCP)



Photo 5.21: Social Forestry (Bhanegaon OC)



Photo 5.22: Social Forestry (Adasa UG to OC)

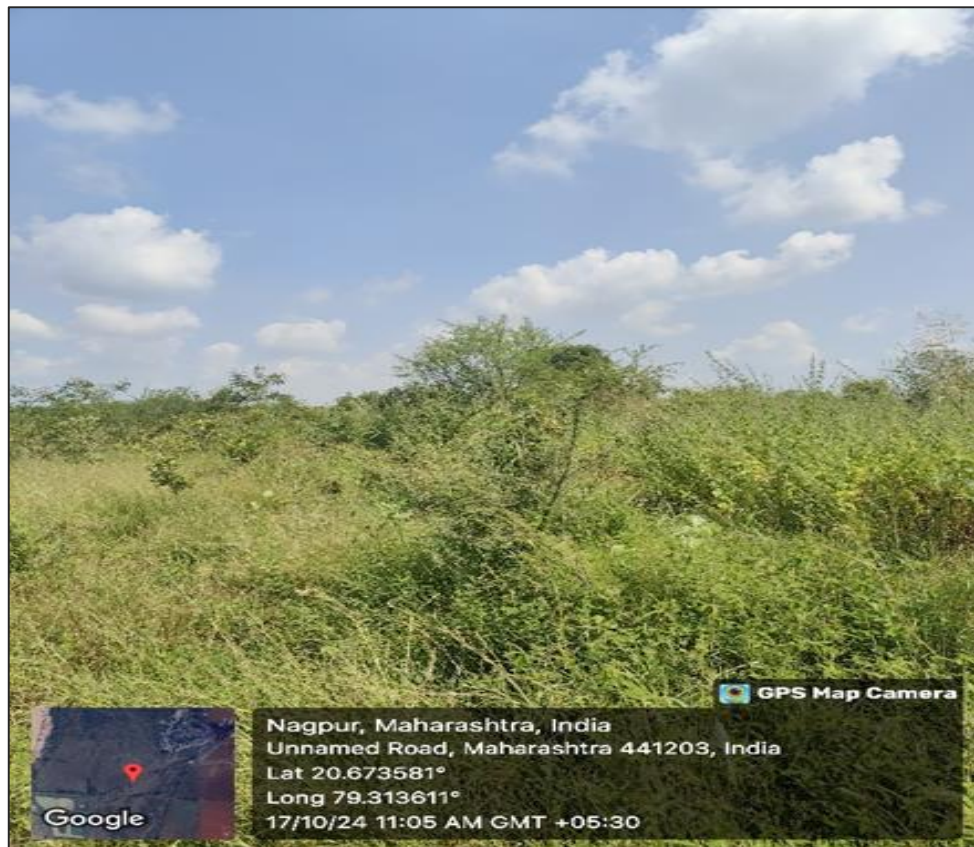


Photo 5.23: Social Forestry (Gokul OC)



Photo 5.24: Social Forestry (Inder Kamptee OC)



Photo 5.25: Social Forestry (Dhoptala OC)

SOUTH EASTERN COALFIELDS LIMITED

6. Land Reclamation Status in South Eastern Coalfields Limited

6.1 Following eighteen (18) opencast projects of SECL producing 5 million cubic m. or more (Coal+OB) together were taken up for land reclamation monitoring based on satellite data during the year 2024-25:

- Dipka
- Gevra
- Kusmunda
- Manikpur
- Saraipali
- Amlai Sector B
- Jampali
- Baroud
- Bijari
- Chhal
- Rajnagar
- Chirimiri
- Kanchan
- Jagannathpur
- Amadand
- Batura
- Amera
- Amgaon

6.2 Project wise Land Reclamation status of the above 18 projects of SECL for the year 2024 is given in Table 6.1 and also shown graphically in Chart- 6.1. Area statistics of different land use cover / class present in the mine leasehold boundaries of the above projects for the year 2024 are shown in the Table – 6.2 (PART A & B). Land use / cover maps derived from satellite data are shown in Plate 6.1 - 6.18. Year wise changes in the different land use / cover classes in last three years based on satellite data are depicted in Bar Charts in Chart. 6.2 - 6.19.

6.3 Study reveals that in the above mentioned 18 projects of SECL under more than 5 mcm (Coal+OB) per annum category, out of total 77.05 Km² excavated area; 50.32 Km² area (65.31%) is under reclamation, out of which 37.88 Km² (49.16%) area is under technical reclamation and 12.44 Km² (16.15%) area is already under biological reclamation.

6.4 After analyzing the satellite data of the year 2024, it is evident that area under land reclamation for the 18 projects of SECL (Table 6.1) has increased from 47.19 Km² (%) in the year 2023 to 50.32 Km² (65.31%) in the year 2024 in a period of one year. There is an increase of 3.13 Km² of area under reclamation, out of which 2.92 Km² area is under technical reclamation and 0.21 Km² area is under biological reclamation.

6.5 It has been also observed that although there has been overall an increase of 2.92 Km² of area under technical reclamation (Barren Backfilling) for the mines during the year 2024-25, but for projects like Chirimiri, Jagannathpur area under technical reclamation has remained same as compared to 2023-24.

6.6 Similarly, there has been overall increase of 0.21 Km² of area under biological reclamation (Plantation on Backfilled areas) for the mines during the year 2024-25. All the projects showed either an increasing or a static trend for biological reclamation except for projects like Gevra, Baroud, Rajnagar where more areas have come under backfilling.

6.7 Plantation on external OB dump has increased from 9.37 Km² in the year 2023 to 8.55 Km² in the year 2024. The projects showed either a slight increase or static trend during the year 2024-25 except for Gevra, Kusmunda, Baroud OCPs due to dumping of OB on vegetated areas owing to constrain in availability of dumping areas and new infrastructure development.

6.8 Plantation under social forestry has increased from 9.50 Km² in the year 2023 to 11.92 Km² in the year 2024. The projects showed either a slight increase or static trend during the year 2024 except for Dipka, Manikpur, Saraipali, Baroud, Chhal, Amadand and

Amgaon where social forestry decreased due to mine advance and other associated reasons.

6.9 Total Green Cover generated in the leasehold of the nineteen projects has increased from 31.10 Km² (16.58%) in the year 2023 to 32.91 Km² (15.83%) in the year 2024 in a period of one year. There has been an increase of 1.81 Km² of Green Cover in the leasehold of the eighteen projects. All the projects showed either a positive or static trend for total green cover during the year 2024-25 except for Dipka, Baroud and Rajnagar. The decrease in the total green cover of these projects is due to advancement of mining and in some cases dumping of OB on vegetated areas owing to constrain in availability of dumping areas.

6.10 Out of 18 projects of SECL, Rajnagar OCP ranks on top for land reclamation (83.82%) followed by Amera OCP (82.72%) and Amgaon OCP (77.88%) in the year 2024-25.

Table 6.1: Summarized Land Reclamation Status in SECL
Summarized Land Reclamation Status in Opencast Projects of NCL based on Satellite Data of the year 2024

Sl. No.	Name of the Project	Total Leasehold Area		Technical Reclamation		Biological		Plantation				Area Under Active Mining		Total Excavated Area		Total Area under Plantation in the leaseholds (%Green Cover Generated)		Total Area Under Reclamation	
				Area under Backfilling	Plantation on Excavated/ Backfilled	Other Plantation													
								Plantation on External OB Dump	Social Forestry, Avenue Plantation Etc.										
1	2	3	4	5		6		7		8		9		10(=5+6+9)		11(=6+7+8)		12(=5+6)	
		2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024
1	Dipka	19.99	19.99	4.21	4.40	1.06	0.96	1.91	1.93	1.65	1.64	2.49	2.70	7.76	8.06	4.62	4.53	5.27	5.36
				54.25%	54.59%	13.66%	11.91%					32.09%	33.50%			23.11%	22.66%	67.91%	66.50%
2	Gevra	41.84	47.82	9.50	9.70	2.26	2.63	4.14	3.20	3.31	5.49	6.74	7.12	18.50	19.45	9.71	11.32	11.76	12.33
				51.35%	49.87%	12.22%	13.52%					36.43%	36.61%			23.21%	23.67%	63.57%	63.39%
3	Kusmunda	16.72	29.91	4.43	5.06	1.20	1.29	1.80	1.62	1.40	1.83	2.62	2.65	8.25	9.00	4.40	4.74	5.63	6.35
				53.70%	56.22%	14.55%	14.33%					31.76%	29.44%			26.32%	15.85%	68.24%	70.56%
4	Manikpur	10.20	10.20	1.61	1.71	0.80	0.82	0.90	1.00	0.38	0.28	2.01	1.98	4.42	4.51	2.08	2.10	2.41	2.53
				36.43%	37.92%	18.10%	18.18%					45.48%	43.90%			20.39%	20.62%	54.52%	56.10%
5	Saraipali	2.79	2.79	0.31	0.35	0.00	0.00	0.00	0.02	0.02	0.01	0.48	0.45	0.79	0.80	0.02	0.03	0.31	0.35
				39.24%	43.75%	0.00%	0.00%					60.76%	56.25%			0.72%	1.16%	39.24%	43.75%
6	Amlai Sector B	1.91	1.91	0.57	0.66	0.04	0.05	0.00	0.00	0.01	0.01	0.63	0.76	1.24	1.47	0.05	0.06	0.61	0.71
				45.97%	44.90%	3.23%	3.40%					50.81%	51.70%			2.62%	3.14%	49.19%	48.30%
7	Jampali	5.83	5.83	1.32	1.43	0.27	0.30	0.00	0.01	0.01	0.01	1.18	1.43	2.77	3.16	0.28	0.32	1.59	1.73
				47.65%	45.25%	9.75%	9.49%					42.60%	45.25%			4.80%	5.49%	57.40%	54.75%
8	Baroud	11.11	11.11	2.15	2.35	0.67	0.46	0.26	0.23	0.15	0.13	1.17	1.85	3.99	4.66	1.08	0.82	2.82	2.81
				53.88%	50.43%	16.79%	9.87%					29.32%	39.70%			9.72%	7.38%	70.68%	60.30%
9	Bijari	2.73	2.73	0.37	0.50	0.01	0.01	0.01	0.01	0.04	0.04	0.38	0.39	0.76	0.90	0.06	0.06	0.38	0.51
				48.68%	55.56%	1.32%	1.11%					50.00%	43.33%			2.20%	2.20%	50.00%	56.67%
10	Chhal	12.07	12.07	2.11	2.17	0.19	0.23	0.01	0.01	0.44	0.43	1.09	1.41	3.39	3.81	0.64	0.67	2.30	2.40
				62.24%	56.96%	5.60%	6.04%					32.15%	37.01%			5.30%	5.55%	67.85%	62.99%
11	Rajnagar	7.30	7.30	1.69	1.85	3.49	3.33	0.00	0.00	0.26	0.26	1.00	1.00	6.18	6.18	3.75	3.59	5.18	5.18
				27.35%	29.94%	56.47%	53.88%					16.18%	16.18%			51.37%	49.18%	83.82%	83.82%
12	Chirimiri	5.44	5.44	1.49	1.49	1.18	1.18	0.00	0.00	0.15	0.15	0.31	0.76	2.98	3.43	1.33	1.33	2.67	2.67
				50.00%	43.44%	39.60%	34.40%					10.40%	22.16%			24.45%	24.45%	89.60%	77.84%
13	Kanchan	6.98	6.98	0.72	1.09	0.36	0.36	0.00	0.10	0.00	0.00	0.67	0.71	1.75	2.16	0.36	0.46	1.08	1.45
				41.14%	50.46%	20.57%	16.67%					38.29%	32.87%			5.16%	6.59%	61.71%	67.13%
14	Jagannathpur	6.62	6.62	1.11	1.11	0.02	0.02	0.00	0.03	0.17	0.25	0.88	1.32	2.01	2.45	0.19	0.30	1.13	1.13
				55.22%	45.31%	1.00%	0.82%					43.78%	53.88%			2.87%	4.53%	56.22%	46.12%
15	Amadand	13.05	13.05	1.49	1.60	0.04	0.04	0.26	0.28	0.66	0.64	0.86	0.96	2.39	2.60	0.96	0.96	1.53	1.64
				62.34%	61.54%	1.67%	1.54%	-				35.98%	36.92%			7.36%	7.36%	64.02%	63.08%
16	Batura	9.43	9.43	0.00	0.14	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.48	0.05	0.62	0.05	0.05	0.00	0.14
				0.00%	22.58%	0.00%	0.00%					100.00%	77.42%			0.53%	0.53%	0.00%	22.58%
17	Amera	6.64	6.64	0.89	0.98	0.36	0.36	0.08	0.11	0.44	0.44	0.30	0.28	1.55	1.62	0.88	0.91	1.25	1.34
				57.42%	60.49%	23.23%	22.22%					19.35%	17.28%			13.25%	13.70%	80.65%	82.72%
18	Amgaon*	6.90	8.01	0.99	1.29	0.28	0.40	0.00	0.00	0.36	0.25	0.30	0.48	1.57	2.17	0.64	0.65	1.27	1.69
				63.06%	59.45%	17.83%	18.43%					19.11%	22.12%			9.28%	8.11%	80.89%	77.88%
Total SECL (MT5 - 18)		187.55	207.83	34.96	37.88	12.23	12.44	9.37	8.55	9.50	11.92	23.16	26.73	70.35	77.05	31.10	32.91	47.19	50.32
				49.69%	49.16%	17.38%	16.15%					32.92%	34.69%	37.51%	37.07%	16.58%	15.83%	67.08%	65.31%

Note: In reference of the above Table - 1, different parameters are described as follows:

1. Area under **Biological Reclamation** includes Areas under Plantation done on Backfilled Area only.
2. Area under **Technical Reclamation** includes Area under Barren Backfilling only
3. Area under Active Mining Includes Coal Quarry, Advance Quarry Site, Quarry filled with water etc., if any.
4. (%) calculated in the above Table is in respect to Total Excavated Area except for "Total Area under Plantation" where % is in terms of Leasehold Area".

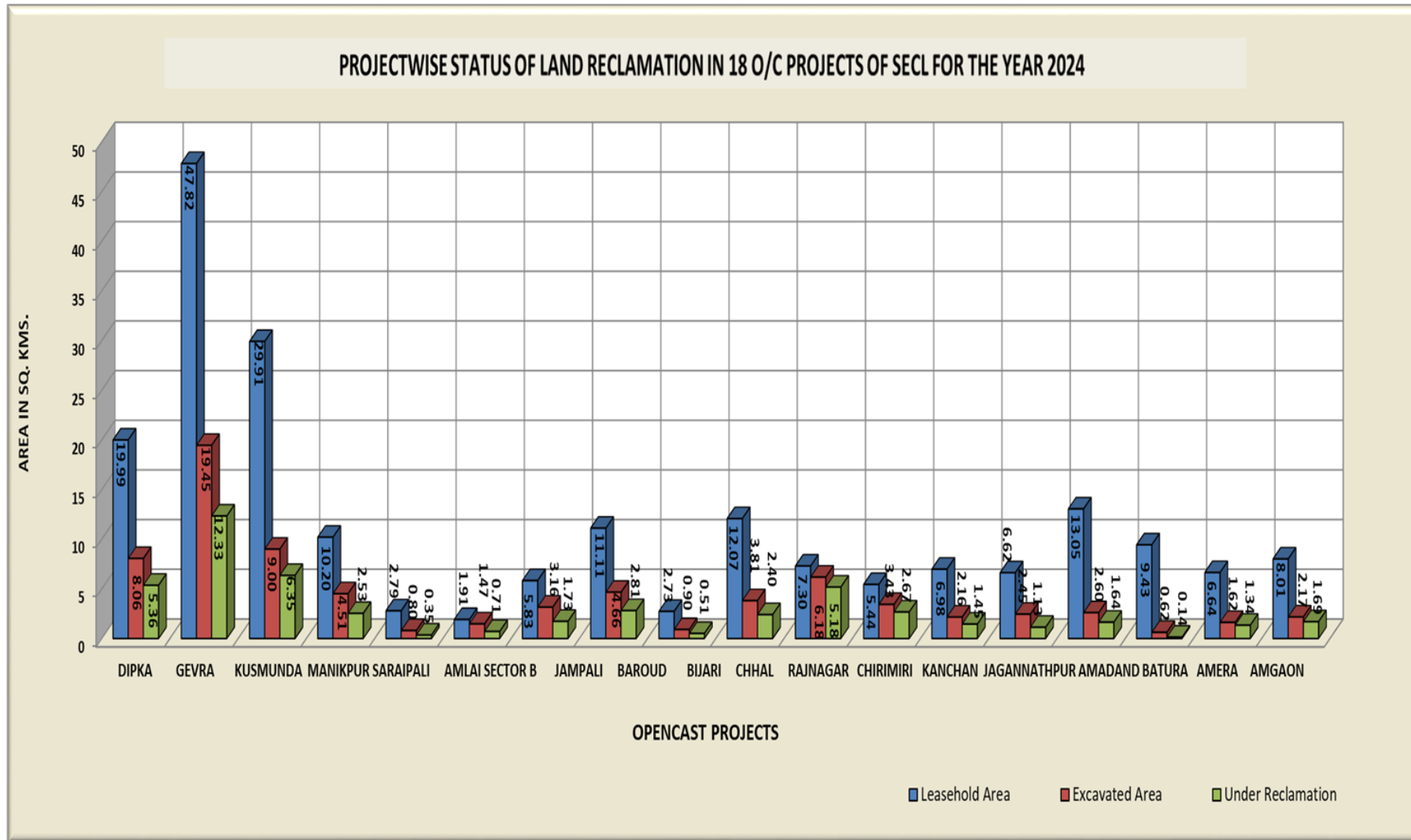


Chart 6.1: Bar Chart showing Land Reclamation Status in SECL

Table 6.2: Project-wise Land Reclamation Status in Opencast Projects of SECL (2024)
Part-A

	LAND USE / COVER CLASS	CLR CODE	DIPKA		GEVRA		KUSMUNDA		MANIKPUR		SARAIPALI		AMLAI SECTOR B		JAMPALI		BAROUD		BIJARI	
			Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
FORESTS	Dense Forest		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	8.58	0.00	0.00	0.00	0.00
	Open Forest		0.00	0.00	0.00	0.00	0.00	0.00	0.24	2.35	0.07	2.54	0.08	4.19	0.66	11.32	1.13	10.17	0.00	0.00
	Total Forest (A)		0.00	0.00	0.00	0.00	0.00	0.00	0.24	2.35	0.07	2.54	0.08	4.19	1.16	19.90	1.13	10.17	0.00	0.00
GREEN COVER	Scrubs (B)		1.33	6.65	1.51	3.16	2.69	8.99	0.75	7.36	0.19	6.81	0.20	10.47	0.35	6.00	1.70	15.30	0.34	12.46
	Social Forestry (C)		1.64	8.21	5.49	11.48	1.83	6.12	0.28	2.75	0.01	0.36	0.01	0.52	0.01	0.17	0.13	1.17	0.04	1.46
	Plantation on External OB Dump		1.93	9.66	3.20	6.69	1.62	5.42	1.00	9.82	0.02	0.72	0.00	0.00	0.01	0.17	0.23	2.07	0.01	0.37
	Plantation over Backfilled Areas (Biological Reclamation)		0.96	4.80	2.63	5.50	1.29	4.31	0.82	8.05	0.00	0.00	0.05	2.62	0.30	5.15	0.46	4.14	0.01	0.40
	Total Area under Plantation (Green Cover) (D)		4.53	22.67	11.32	23.67	4.74	15.85	2.10	20.62	0.03	1.08	0.06	3.14	0.32	5.49	0.82	7.38	0.06	2.23
	Total Vegetation (A to D)		5.86	29.32	12.83	26.83	7.43	24.84	3.09	30.33	0.29	10.43	0.34	17.80	1.83	31.39	3.65	32.85	0.40	14.69
AREA UNDER ACTIVE MINING	Coal Quarry		1.94	9.70	5.76	12.05	1.87	6.25	1.82	17.85	0.31	11.11	0.55	28.80	0.81	13.89	0.87	7.83	0.12	4.39
	Coal Dump		0.44	2.20	0.48	1.00	0.60	2.01	0.06	0.59	0.07	2.48	0.01	0.52	0.21	3.60	0.11	0.99	0.08	2.93
	Advance Quarry Site		0.23	1.15	0.18	0.38	0.15	0.50	0.09	0.89	0.06	2.15	0.14	7.28	0.18	3.09	0.42	3.78	0.04	1.46
	Quarry Filled With Water		0.09	0.46	0.70	1.46	0.03	0.10	0.01	0.10	0.01	0.36	0.06	3.14	0.23	3.95	0.45	4.05	0.15	5.49
	Total Area under Active Mining (F)		2.70	13.51	7.12	14.89	2.65	8.86	1.98	19.43	0.45	16.10	0.76	39.74	1.43	24.53	1.85	16.65	0.39	14.27
TECHNICAL RECLAMATION	Barren OB Dump (G)		0.66	3.30	0.66	1.38	0.71	2.37	1.40	13.73	0.36	12.90	0.00	0.00	0.19	3.26	0.37	3.33	0.14	5.13
	Area under Barren Backfilling		4.40	22.01	9.70	20.28	5.06	16.92	1.71	16.77	0.35	12.54	0.66	34.56	1.43	24.53	2.35	21.15	0.50	18.31
	Total Area under Technical Reclamation (H)		4.40	22.01	9.70	20.28	5.06	16.92	1.71	16.77	0.35	12.54	0.66	34.56	1.43	24.53	2.35	21.15	0.50	18.31
WASTELANDS	Total Area under Mining Activity (F+G+H)		7.76	38.82	17.48	36.55	8.42	28.15	5.09	49.93	1.16	41.54	1.42	74.30	3.05	52.32	4.57	41.13	1.03	37.71
	Waste Lands		2.96	14.81	6.50	13.59	3.25	10.87	0.45	4.42	0.28	10.04	0.15	7.90	0.37	6.35	0.59	5.31	0.23	8.42
	Sand Body		0.00	0.00	0.00	0.00	0.04	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.09	0.00	0.00
INTERLUDES	Total Wasteland (I)		2.96	14.81	6.50	13.59	3.29	11.00	0.45	4.42	0.28	10.04	0.15	7.90	0.37	6.35	0.60	5.40	0.23	8.42
	Reservoir, nallah, ponds		0.32	1.60	0.34	0.72	0.56	1.87	0.24	2.35	0.11	3.94	0.00	0.00	0.02	0.34	0.14	1.26	0.01	0.37
	Total Waterbodies (J)		0.32	1.60	0.34	0.72	0.56	1.87	0.24	2.35	0.11	3.94	0.00	0.00	0.02	0.34	0.14	1.26	0.01	0.37
AGRICULTURE	Crop Lands		0.03	0.15	0.22	0.46	0.40	1.34	0.47	4.61	0.19	6.81	0.00	0.00	0.07	1.20	0.23	2.08	0.05	1.83
	Fallow Lands		0.95	4.75	5.93	12.40	7.72	25.81	0.33	3.24	0.68	24.37	0.00	0.00	0.41	7.03	1.68	15.12	0.97	35.52
	Total Agriculture (K)		0.98	4.90	6.15	12.86	8.12	27.15	0.80	7.85	0.87	31.18	0.00	0.00	0.48	8.23	1.91	17.20	1.02	37.35
SETTLEMENTS	Urban Settlement		0.58	2.90	1.09	2.28	0.64	2.14	0.13	1.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Rural Settlement		0.66	3.30	1.89	3.95	0.79	2.64	0.13	1.28	0.01	0.36	0.00	0.00	0.01	0.17	0.10	0.90	0.04	1.46
	Industrial Settlement		0.87	4.35	1.54	3.22	0.66	2.21	0.26	2.56	0.07	2.51	0.00	0.00	0.07	1.20	0.14	1.26	0.00	0.00
	Total Settlement (L)		2.11	10.55	4.52	9.45	2.09	6.99	0.52	5.12	0.08	2.87	0.00	0.00	0.08	1.37	0.24	2.16	0.04	1.46
Grand Total (A to L)			19.99	100.00	47.82	100.00	29.91	100.00	10.20	100.00	2.79	100.00	1.91	100.00	5.83	100.00	11.11	100.00	2.73	100.00

Part-B

	LAND USE / COVER CLASS	CLR CODE	CHHAL		RAJNAGAR		CHIRIMIRI		KANCHAN		JAGANNATHPUR		AMADAND		BATURA		AMERA		AMGAON		TOTAL	
			Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
FORESTS	Dense Forest		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.24
	Open Forest		1.69	14.00	0.00	0.00	0.76	13.98	0.00	0.00	0.06	0.91	0.00	0.00	0.20	2.12	0.00	0.00	0.09	1.14	4.98	2.40
	Total Forest (A)		1.69	14.00	0.00	0.00	0.76	13.98	0.00	0.00	0.06	0.91	0.00	0.00	0.20	2.12	0.00	0.00	0.09	1.14	5.48	2.64
	Scrubs (B)		1.49	12.34	0.23	3.08	0.58	10.66	0.55	7.90	0.27	4.08	0.20	1.53	1.42	15.06	0.12	1.82	0.50	6.24	14.42	6.94
GREEN COVER	Social Forestry (C)		0.43	3.56	0.26	3.56	0.15	2.76	0.00	0.00	0.25	3.78	0.64	4.90	0.05	0.53	0.44	6.64	0.25	3.12	11.91	5.73
	Plantation on External OB Dump		0.01	0.08	0.00	0.00	0.00	0.00	0.10	1.43	0.03	0.45	0.28	2.15	0.00	0.00	0.11	1.66	0.00	0.00	8.55	4.11
	Plantation over Backfilled Areas (Biological Reclamation)		0.23	1.91	3.33	45.61	1.18	21.68	0.36	5.16	0.02	0.30	0.04	0.31	0.00	0.00	0.36	5.43	0.40	4.99	12.44	5.99
	Total Area under Plantation (Green Cover) (D)		0.67	5.55	3.59	49.17	1.33	24.44	0.46	6.59	0.30	4.53	0.96	7.36	0.05	0.53	0.91	13.73	0.65	8.11	32.91	15.83
	Total Vegetation (A to D)		3.85	31.89	3.82	52.25	2.67	49.08	1.01	14.49	0.63	9.52	1.16	8.89	1.67	17.71	1.03	15.55	1.24	15.49	52.81	25.41
AREA UNDER ACTIVE MINING	Coal Quarry		0.54	4.48	0.44	6.03	0.24	4.41	0.40	5.73	0.99	14.95	0.57	4.37	0.30	3.18	0.00	0.00	0.22	2.75	17.75	8.54
	Coal Dump		0.22	1.83	0.03	0.41	0.09	1.65	0.04	0.57	0.07	1.06	0.08	0.61	0.05	0.53	0.06	0.90	0.04	0.50	2.74	1.32
	Advance Quarry Site		0.38	3.15	0.00	0.00	0.41	7.53	0.23	3.30	0.00	0.00	0.14	1.07	0.13	1.38	0.00	0.00	0.09	1.14	2.87	1.38
	Quarry Filled With Water		0.27	2.24	0.53	7.26	0.02	0.39	0.04	0.57	0.26	3.93	0.17	1.30	0.00	0.00	0.22	3.33	0.13	1.62	3.37	1.62
	Total Area under Active Mining (F)		1.41	11.70	1.00	13.70	0.76	13.98	0.71	10.17	1.32	19.94	0.96	7.35	0.48	5.09	0.28	4.23	0.48	6.01	26.73	12.86
	Barren OB Dump (G)		1.11	9.19	0.00	0.00	0.00	0.00	0.75	10.75	0.30	4.53	0.90	6.90	0.36	3.82	0.02	0.30	0.09	1.12	8.02	3.86
TECHNICAL RECLAMATION	Area under Barren Backfilling		2.17	17.97	1.85	25.34	1.49	27.38	1.09	15.65	1.11	16.77	1.60	12.26	0.14	1.48	0.98	14.75	1.29	16.10	37.88	18.23
	Total Area under Technical Reclamation (H)		2.17	17.97	1.85	25.34	1.49	27.38	1.09	15.65	1.11	16.77	1.60	12.26	0.14	1.48	0.98	14.75	1.29	16.10	37.88	18.23
	Total Area under Mining Activity (F+G+H)		4.69	38.86	2.85	39.04	2.25	41.36	2.55	36.57	2.73	41.24	3.46	26.51	0.98	10.39	1.28	19.28	1.86	23.23	72.63	34.95
WASTELANDS	Waste Lands		1.02	8.45	0.44	6.03	0.38	6.98	0.08	1.15	0.21	3.17	1.20	9.20	0.34	3.61	0.17	2.56	0.40	4.99	19.02	9.15
	Sand Body		0.02	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.21	0.01	0.15	0.00	0.10	0.05	
	Total Wasteland (I)		1.04	8.62	0.44	6.03	0.38	6.98	0.08	1.15	0.21	3.17	1.20	9.20	0.36	3.82	0.18	2.71	0.40	4.99	19.12	9.20
WATERBODIES	Reservoir, nallah, ponds		0.22	1.82	0.02	0.27	0.04	0.74	0.07	1.06	0.14	2.11	0.07	0.54	0.17	1.80	0.07	1.05	0.06	0.75	2.61	1.25
	Total Waterbodies (J)		0.22	1.82	0.02	0.27	0.04	0.74	0.07	1.06	0.14	2.11	0.07	0.54	0.17	1.80	0.07	1.05	0.06	0.75	2.61	1.25
AGRICULTURE	Crop Lands		0.34	2.82	0.01	0.14	0.00	0.00	0.06	0.86	1.50	22.66	1.18	9.04	0.16	1.70	0.28	4.21	1.45	18.10	6.64	3.20
	Fallow Lands		1.73	14.33	0.06	0.82	0.00	0.00	3.11	44.58	1.29	19.49	5.66	43.37	5.99	63.52	3.63	54.64	2.79	34.82	42.93	20.66
	Total Agriculture (K)		2.07	17.15	0.07	0.96	0.00	0.00	3.17	45.44	2.79	42.15	6.84	52.41	6.15	65.22	3.91	58.85	4.24	52.92	49.57	23.85
SETTLEMENTS	Urban Settlement		0.13	1.08	0.08	1.11	0.07	1.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.72	1.31	
	Rural Settlement		0.03	0.25	0.01	0.07	0.02	0.37	0.09	1.29	0.10	1.51	0.24	1.84	0.08	0.85	0.16	2.41	0.19	2.37	4.55	2.19
	Industrial Settlement		0.04	0.33	0.02	0.27	0.01	0.18	0.00	0.00	0.02	0.30	0.08	0.61	0.02	0.21	0.01	0.15	0.02	0.25	3.83	1.84
	Total Settlement (L)		0.20	1.66	0.11	1.45	0.10	1.84	0.09	1.29	0.12	1.81	0.32	2.45	0.10	1.06	0.17	2.56	0.21	2.62	11.10	5.34
	Grand Total (A to L)		12.07	100.00	7.30	100.00	5.44	100.00	6.98	100.00	6.62	100.00	13.05	100.00	9.43	100.00	6.64	100.00	8.01	100.00	207.83	100.00

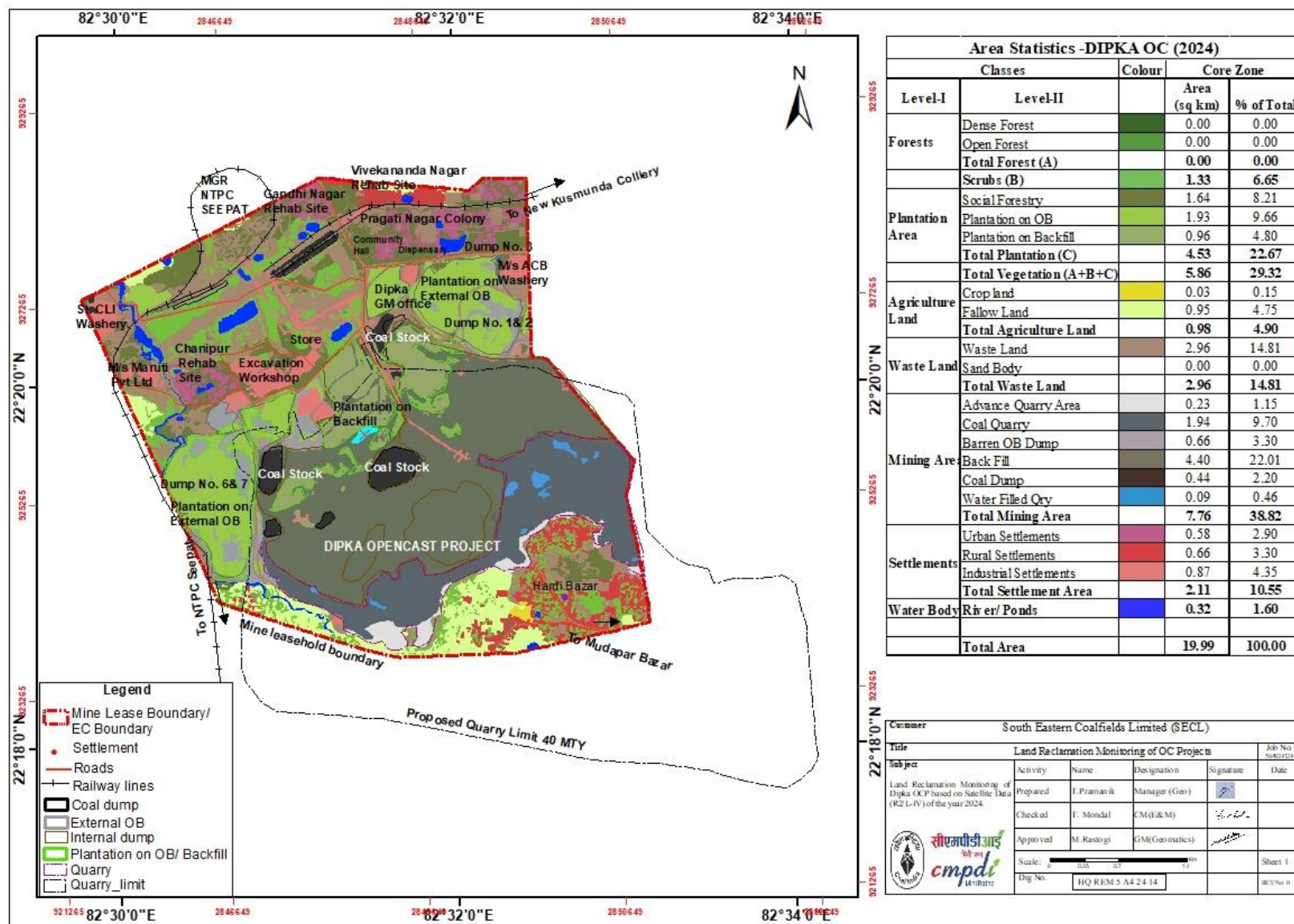


Plate 6-1: Land Use/Cover map of Dipka OCP

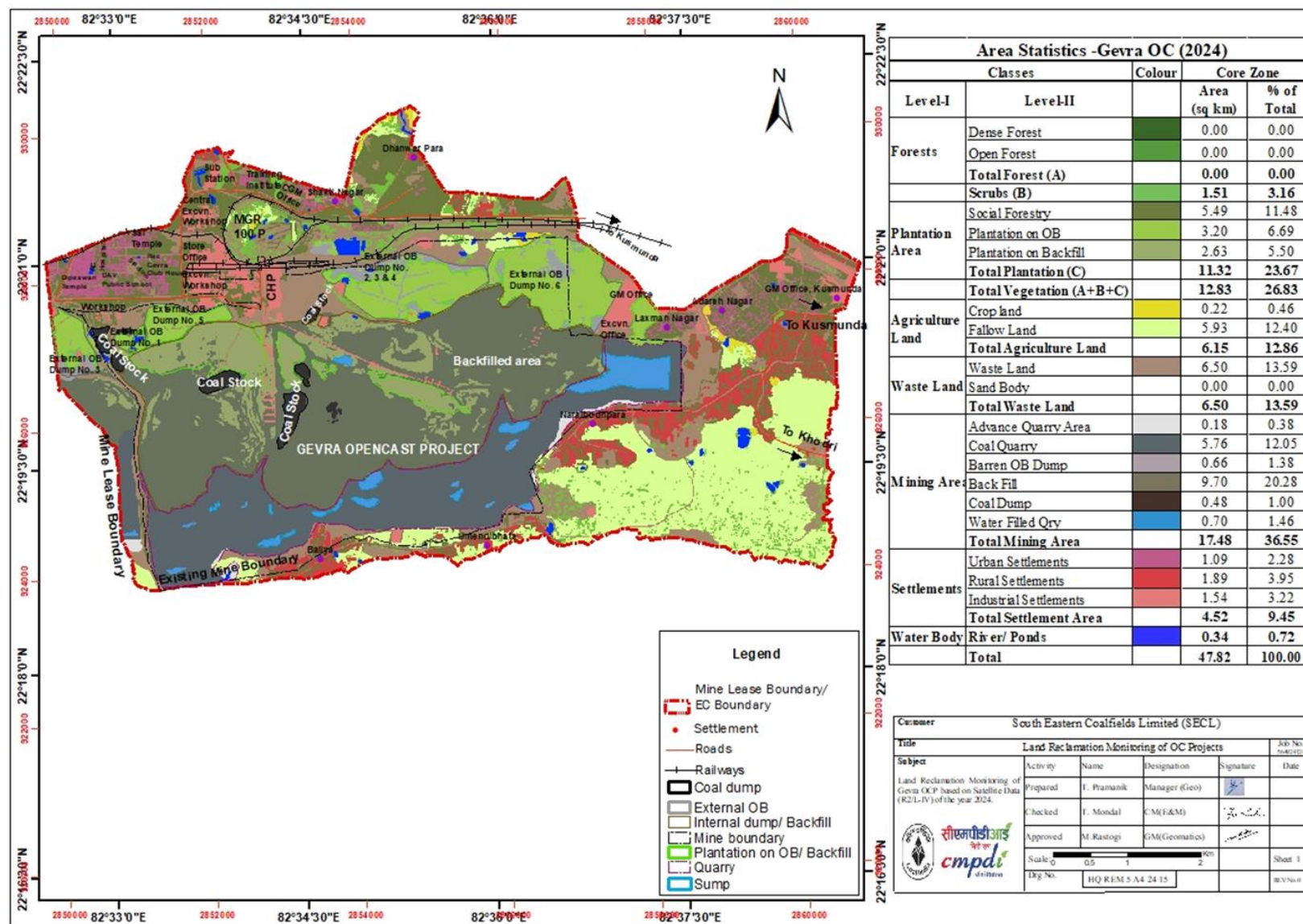


Plate 6-2: Land Use/Cover map of Gevra OCP

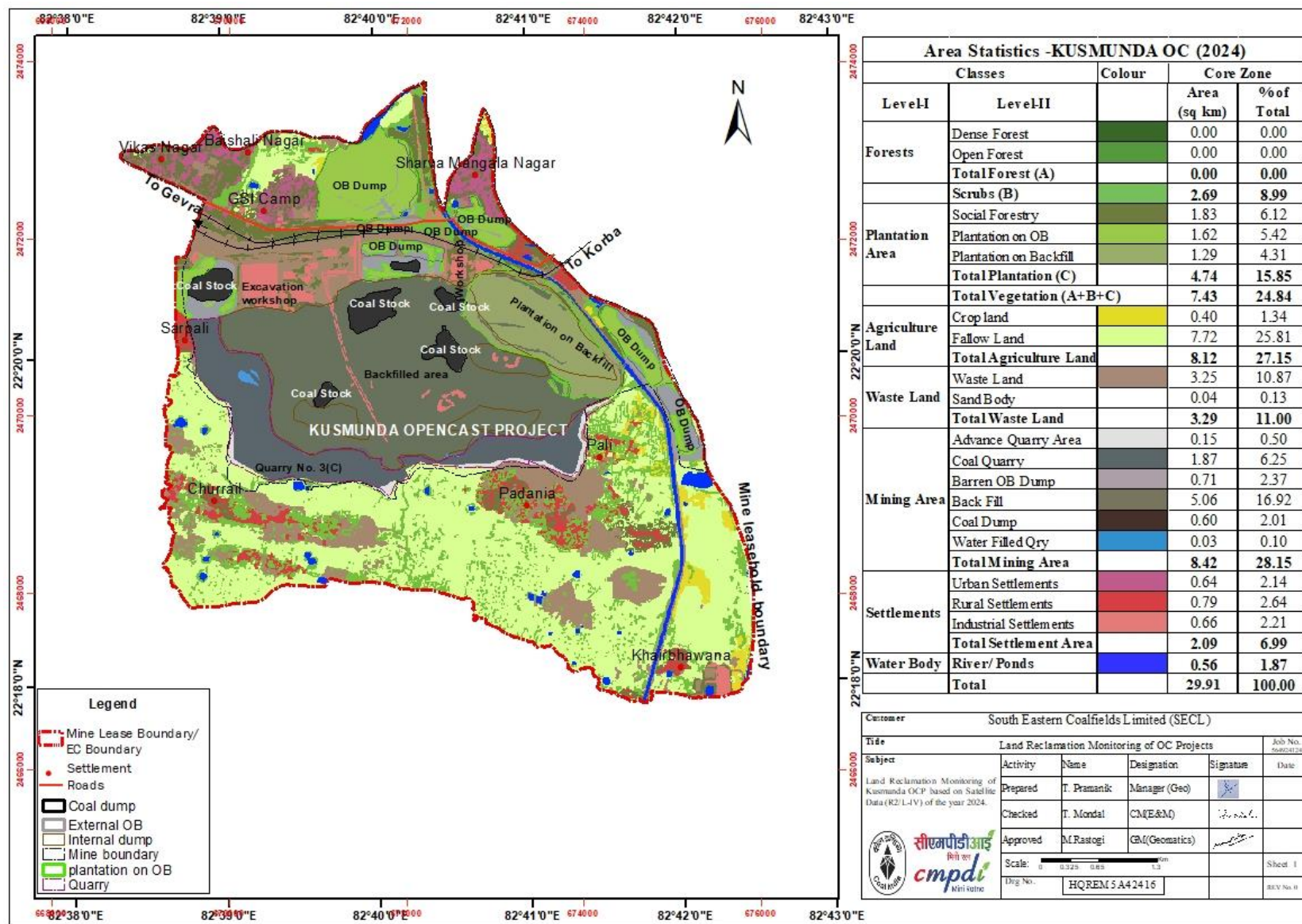


Plate 6-3: Land Use/Cover map of Kusmunda OCP

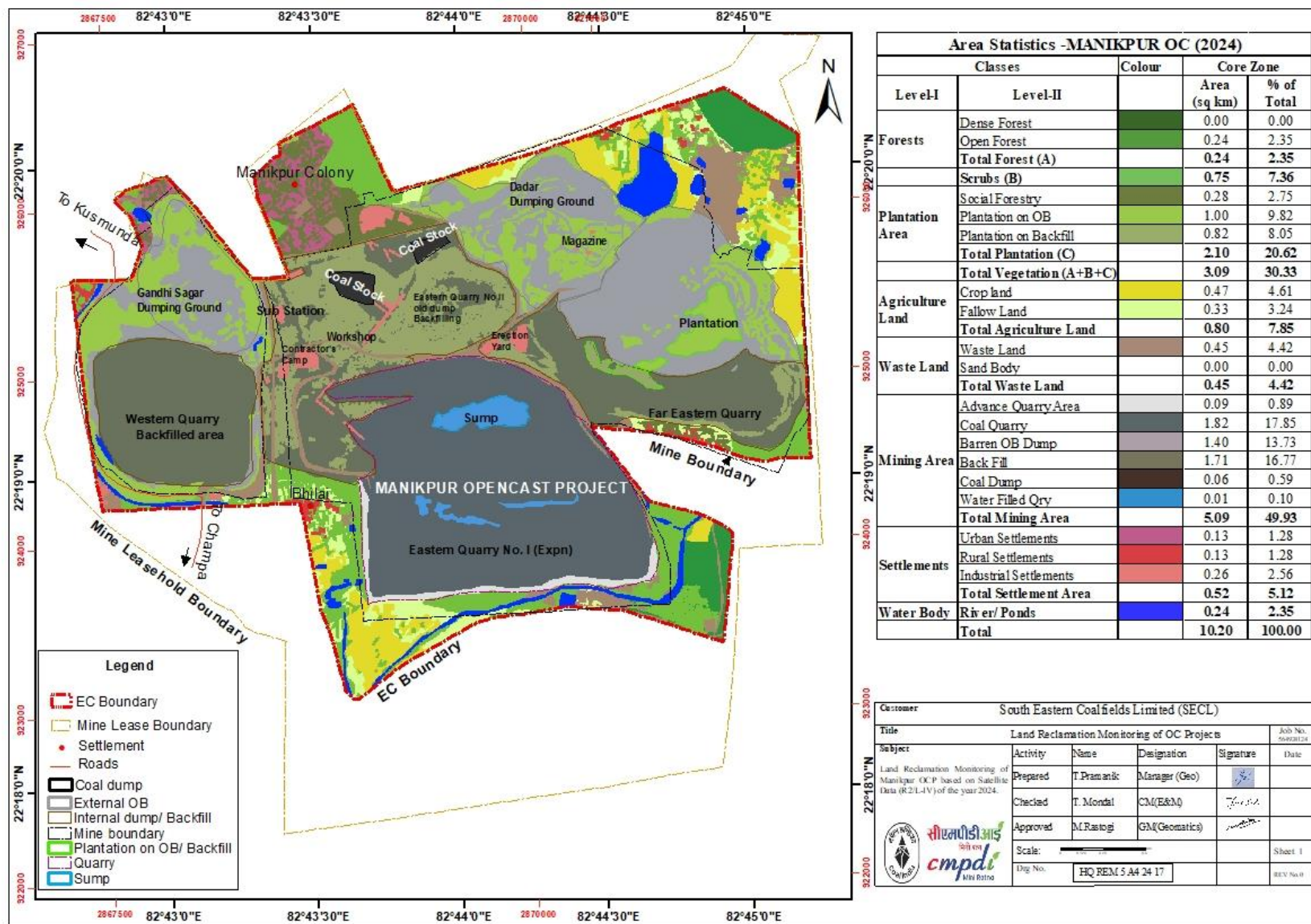
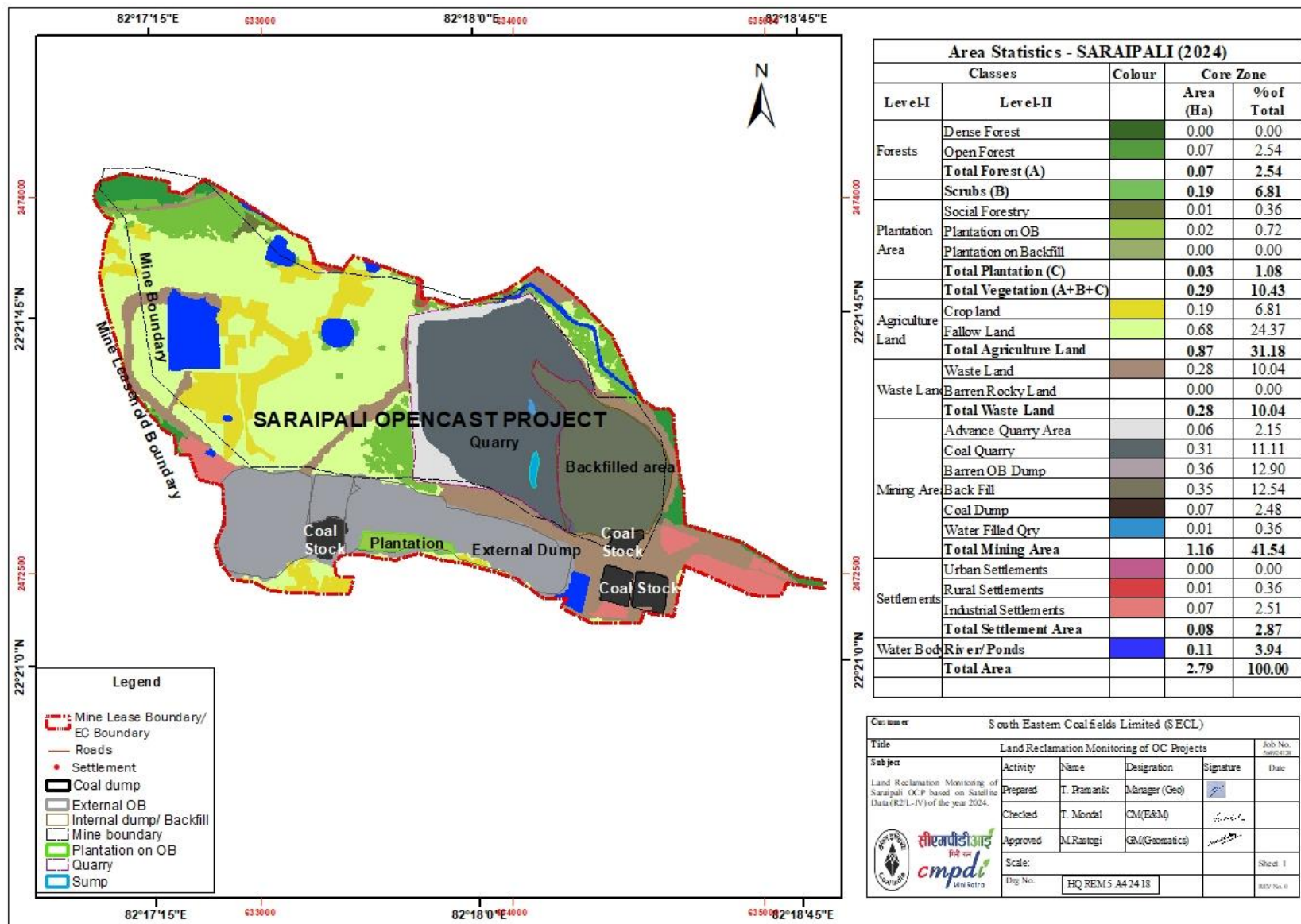


Plate 6-4: Land Use/Cover map of Manikpur OCP



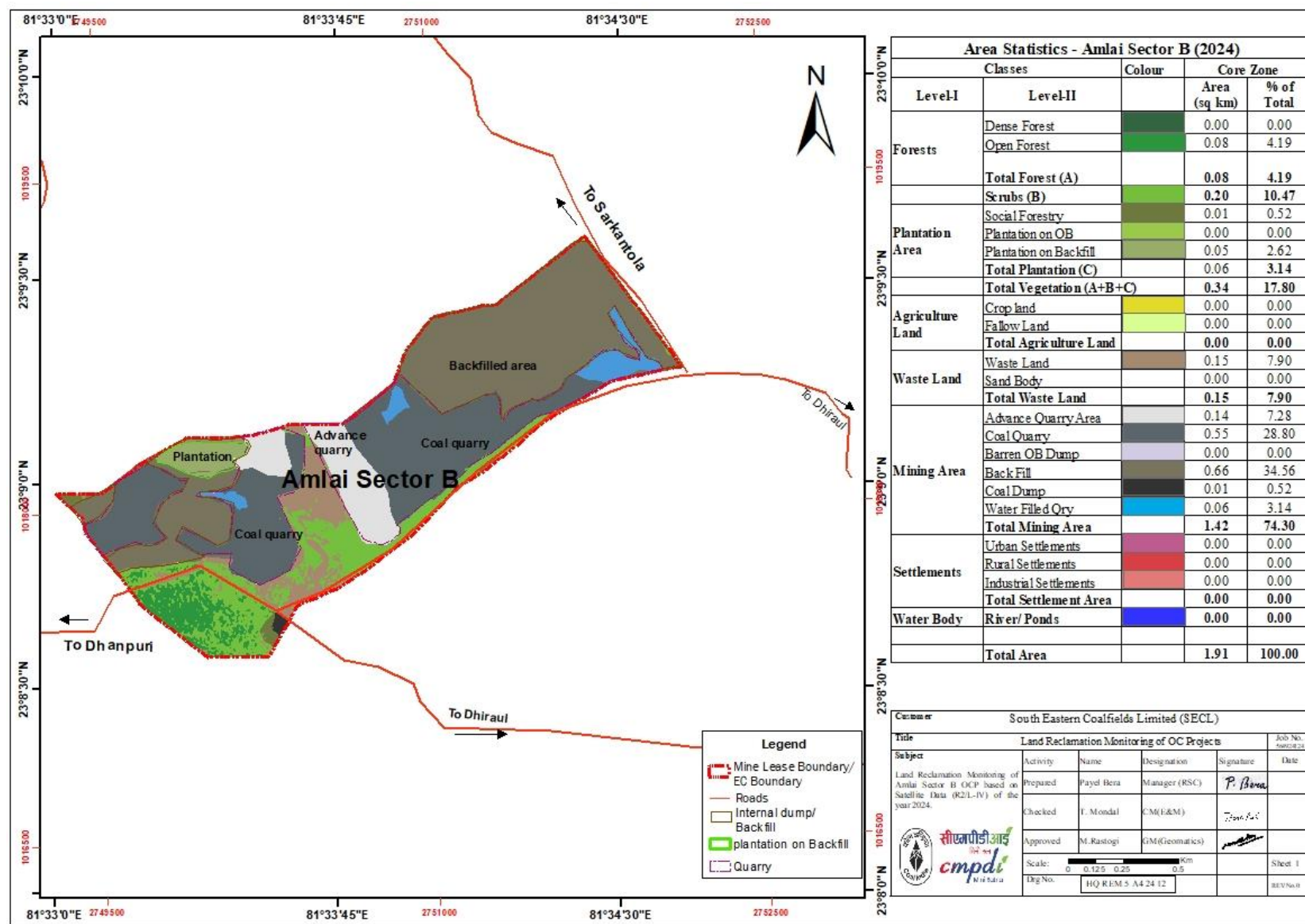


Plate 6-6: Land Use/Cover map of Amlai Sector B OCP

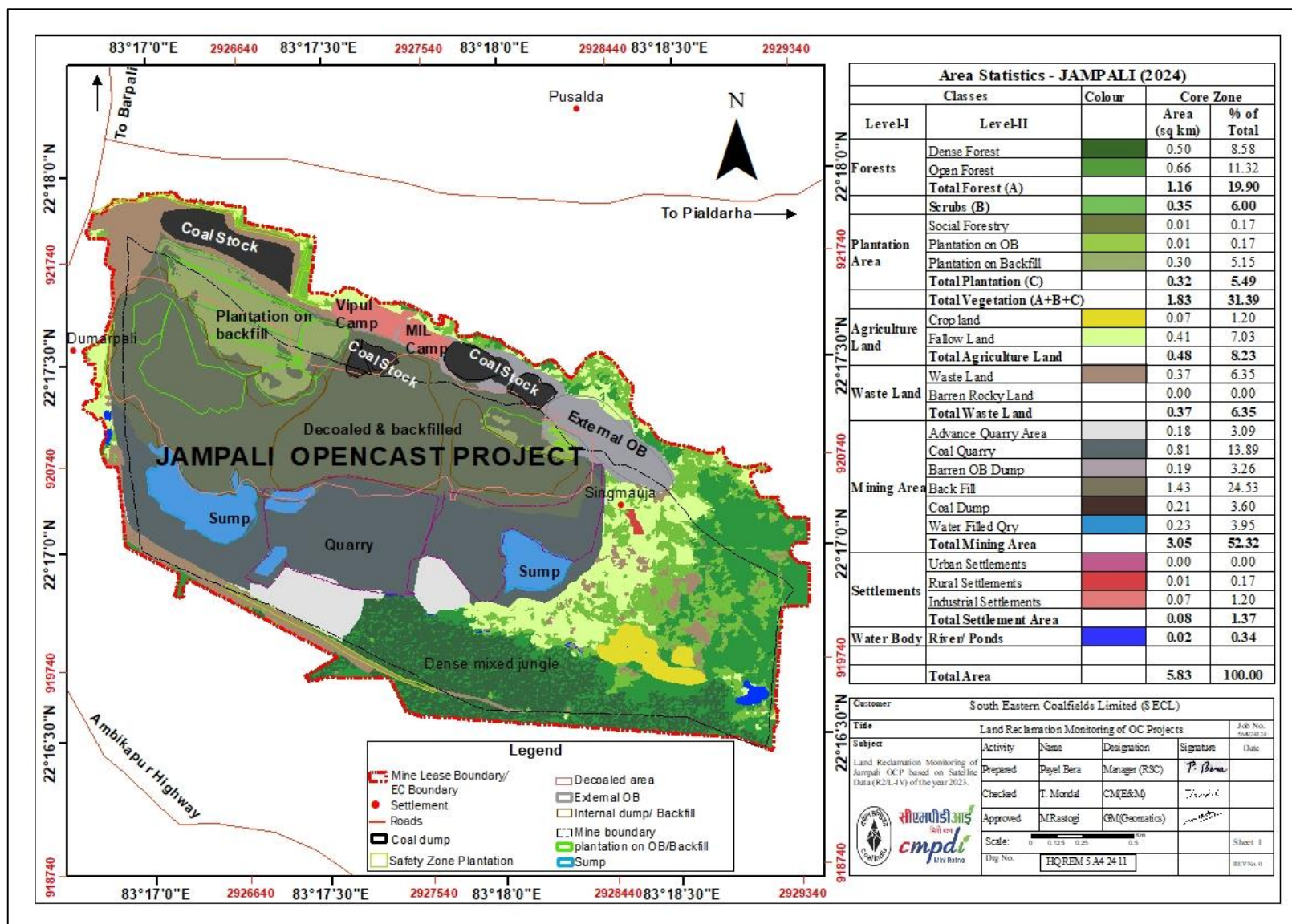


Plate 6-7: Land Use/Cover map of Jampali OCP

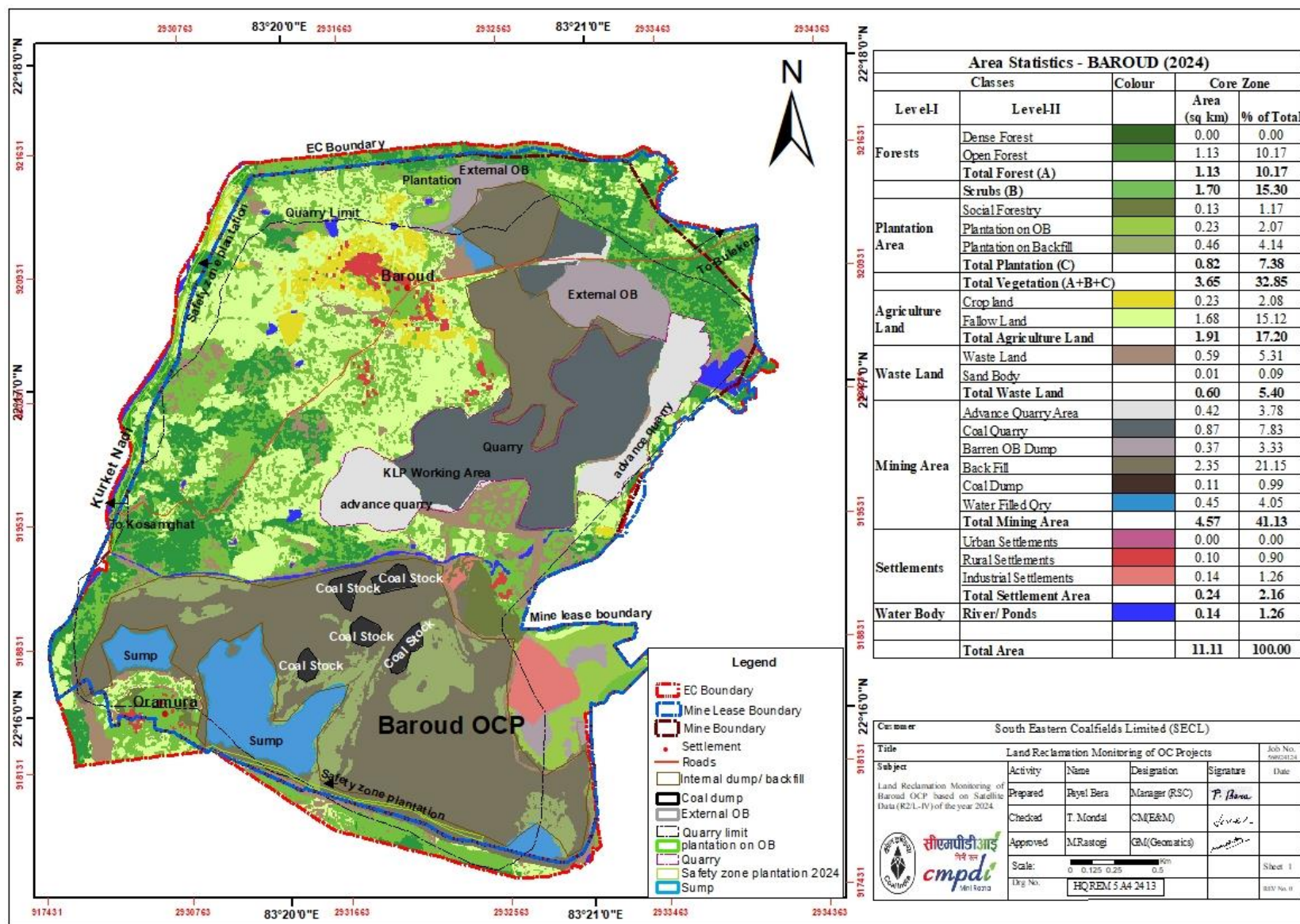


Plate 6-8: Land Use/Cover map of Baroud OCP

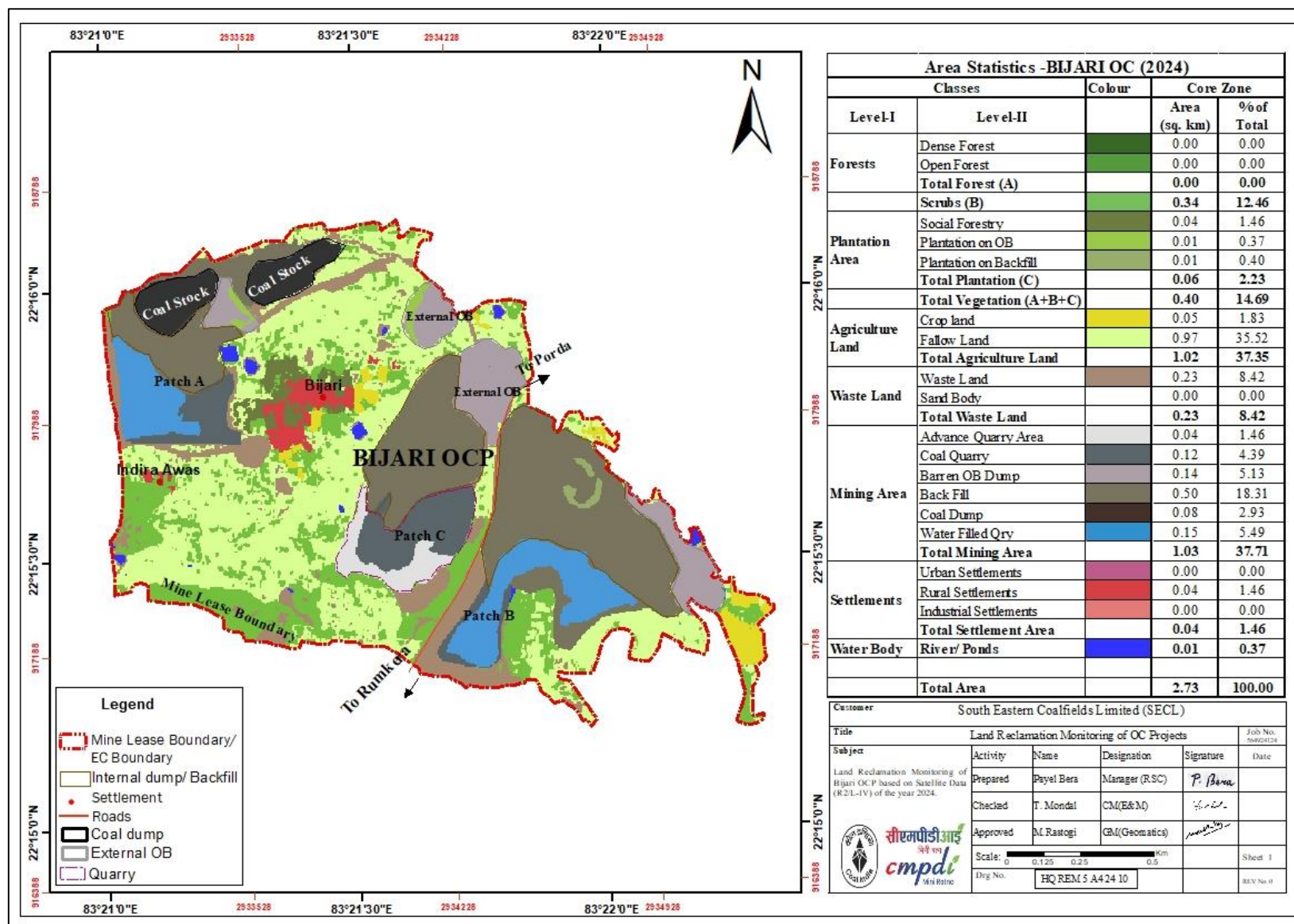
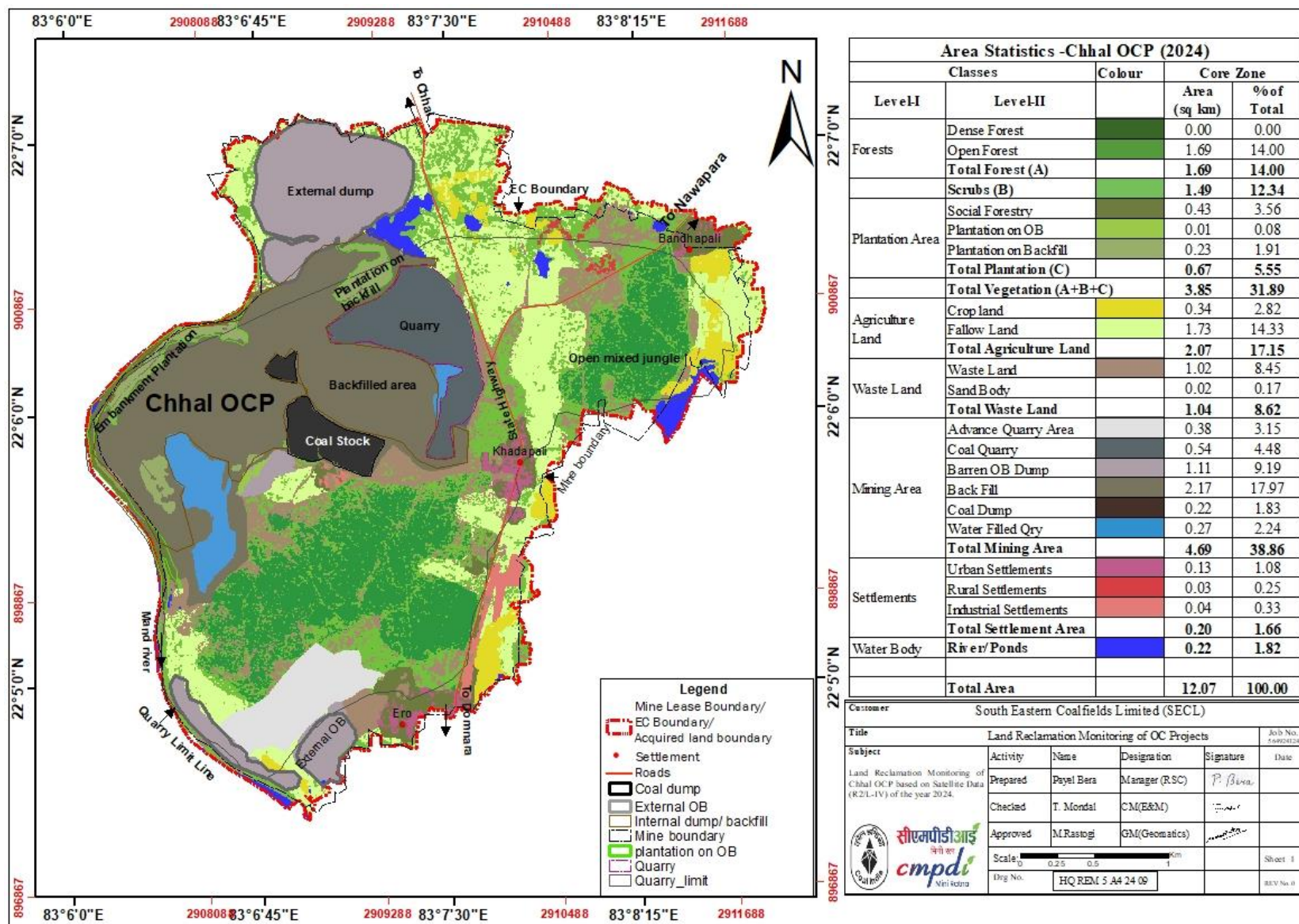


Plate 6-9: Land Use/Cover map of Bijari OCP



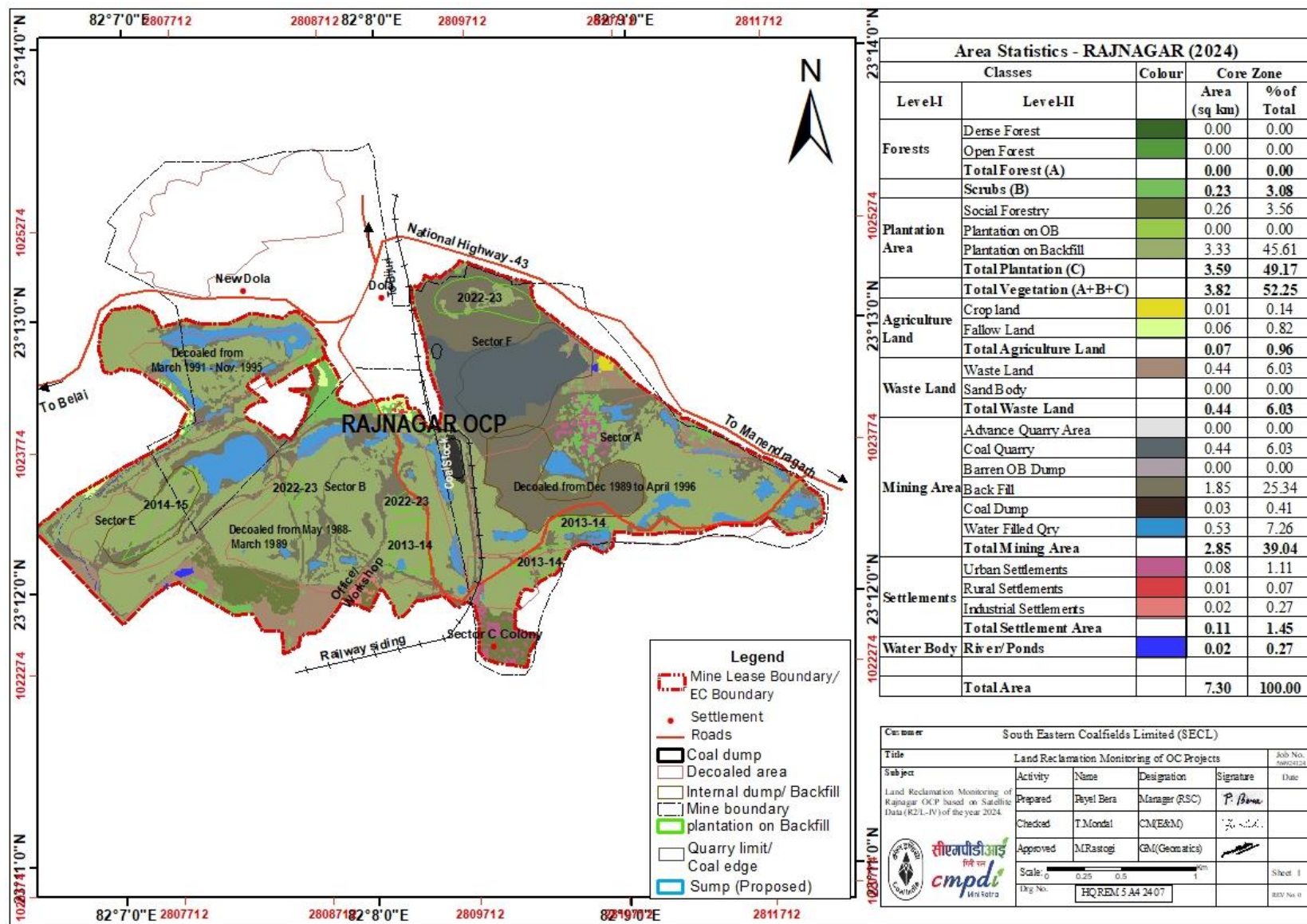


Plate 6-11: Land Use/Cover map of Rajnagar OCP

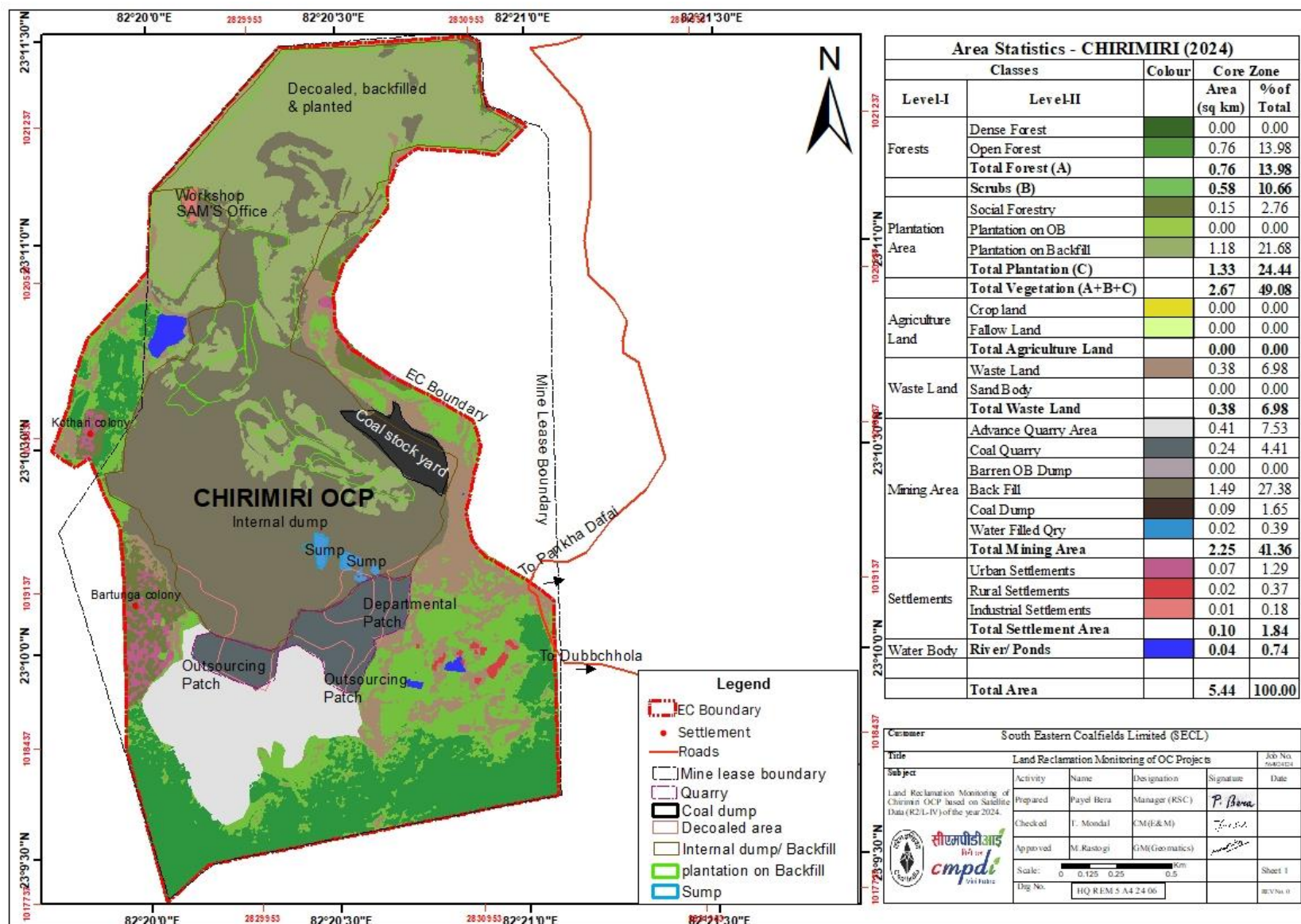


Plate 6-12: Land Use/Cover map of Chirimiri OCP



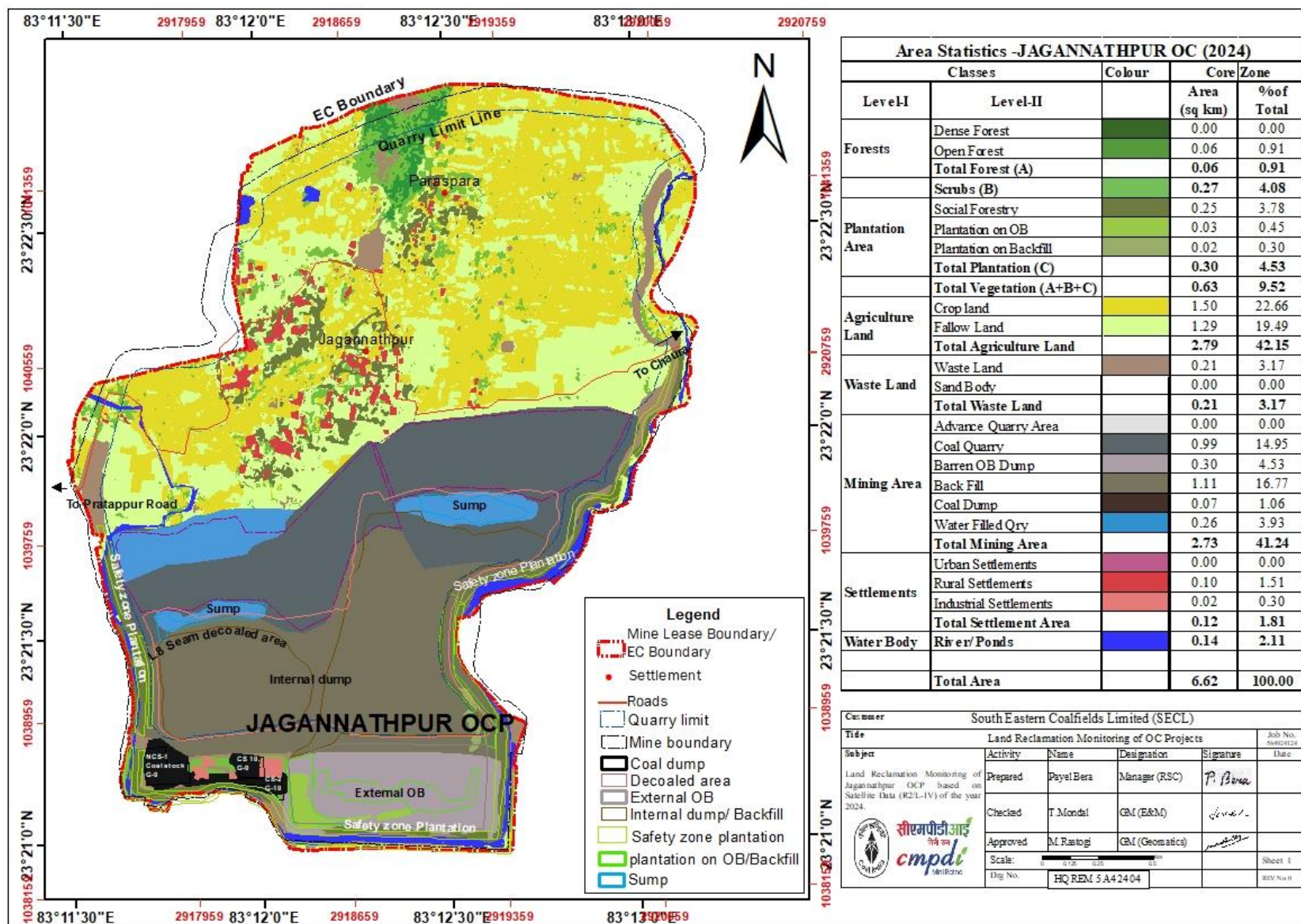


Plate 6-14: Land Use/Cover map of Jagannathpur OCP

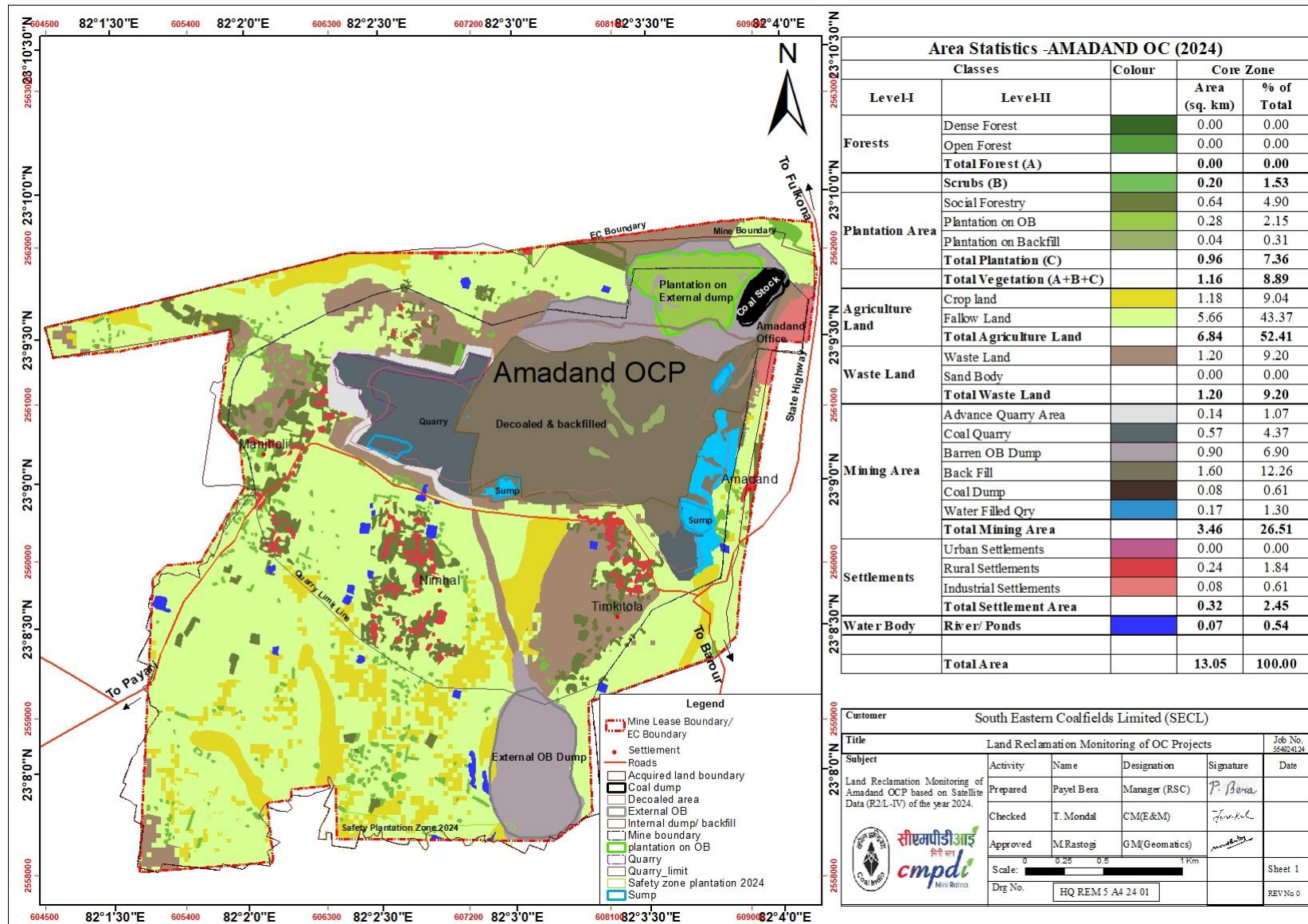


Plate 6-15: Land Use/Cover map of Amadand OCP

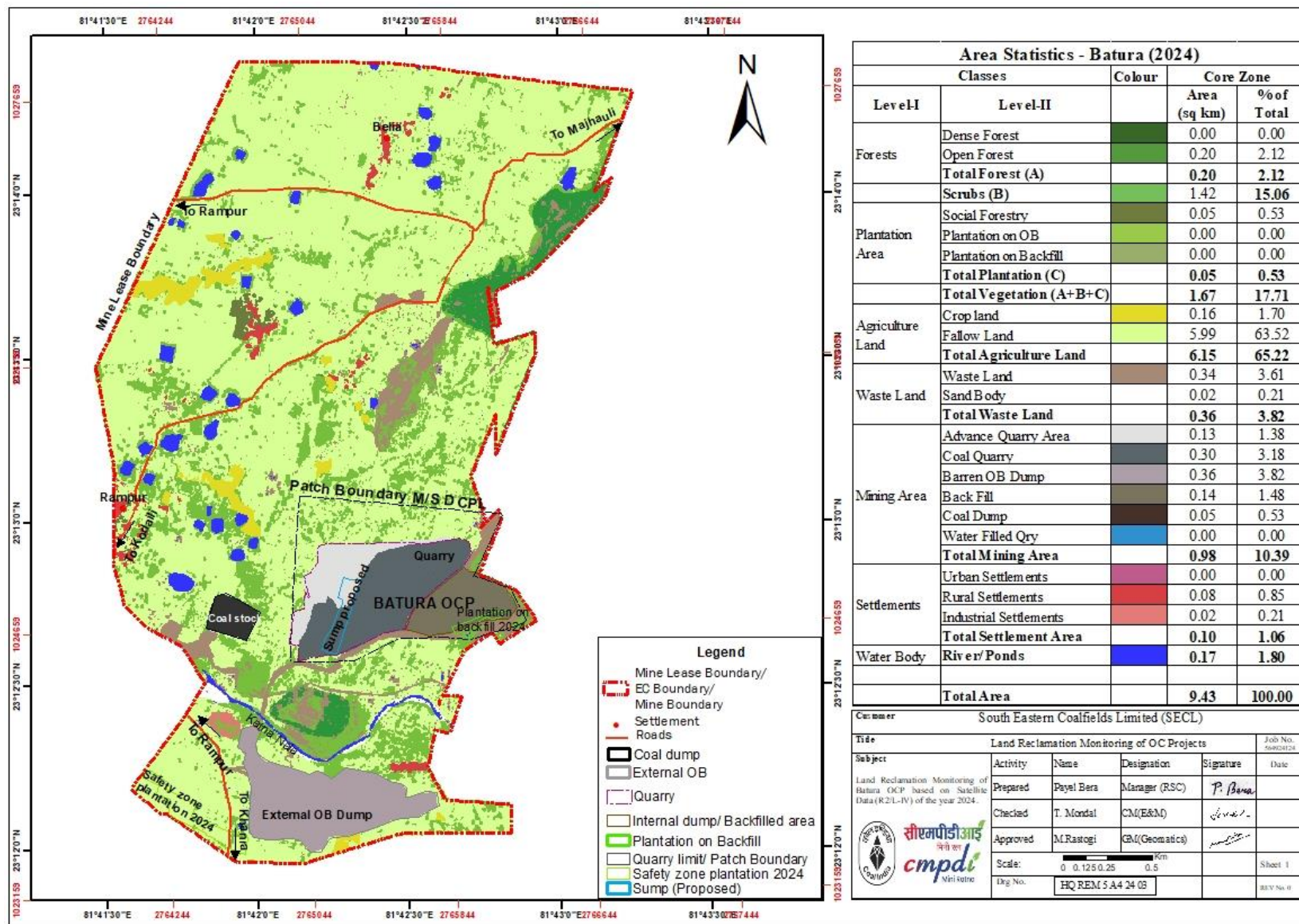


Plate 6-16: Land Use/Cover map of Batura OCP

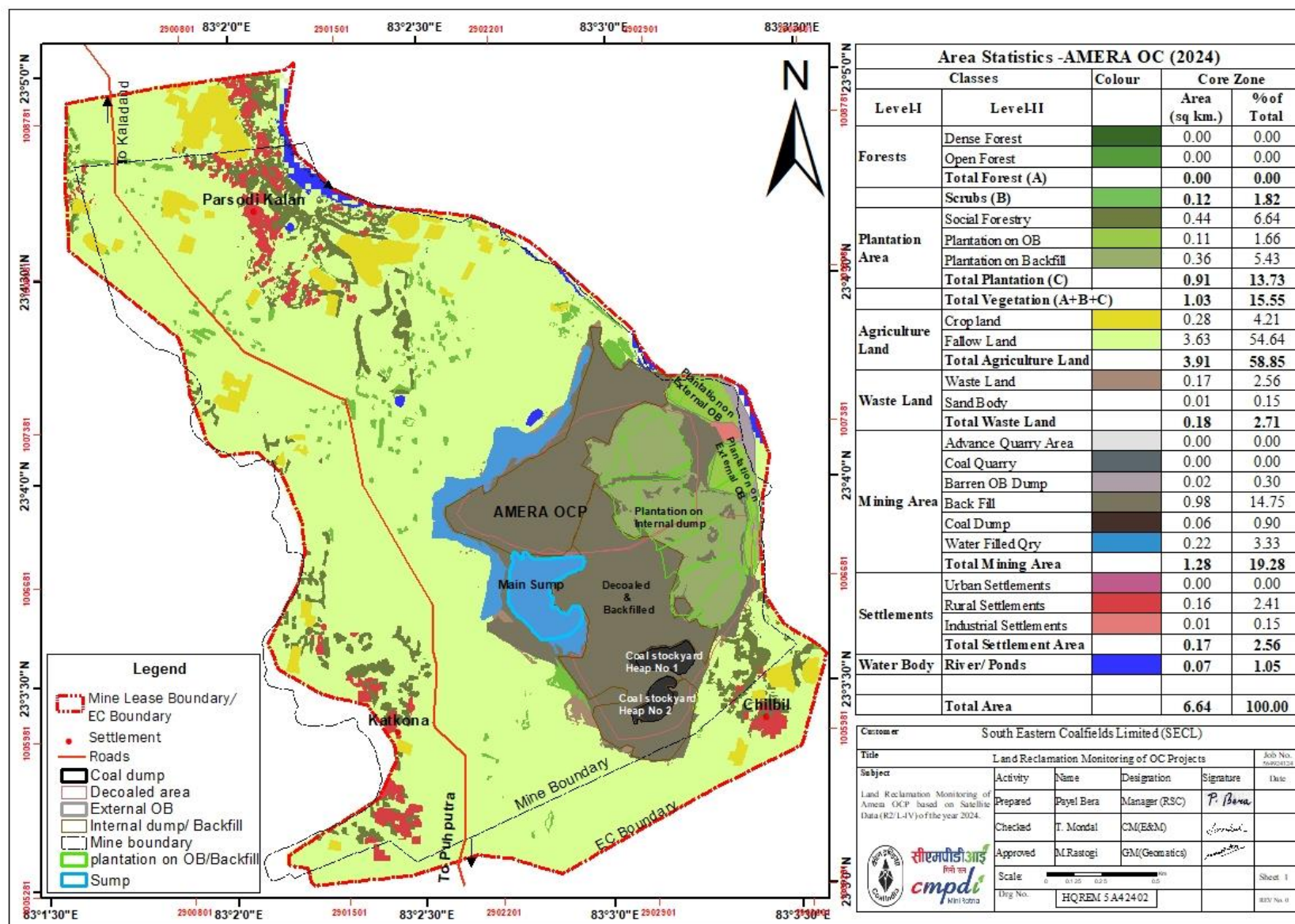


Plate 6-17: Land Use/Cover map of Amera OCP

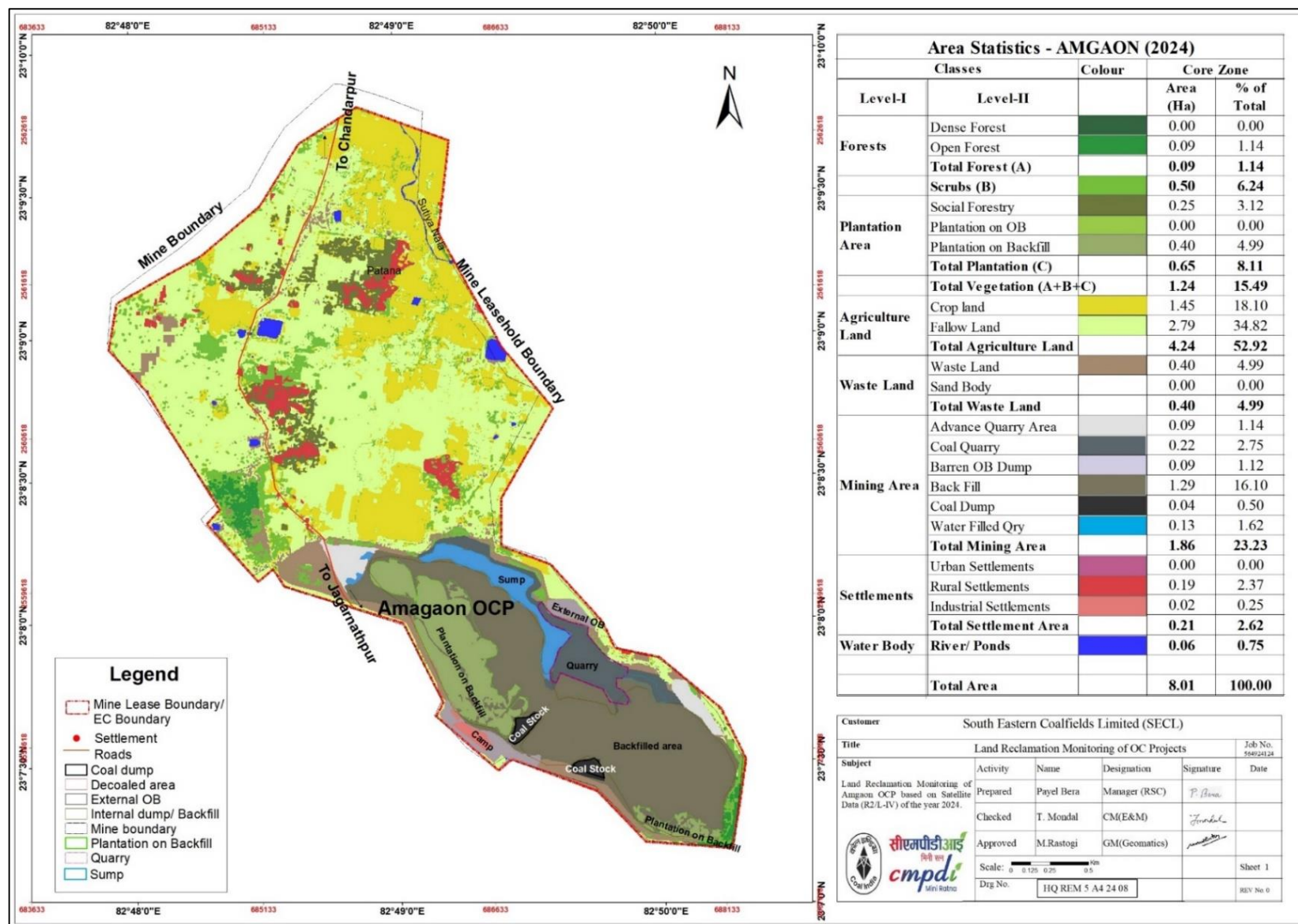


Plate 6-18: Land Use/Cover map of Amgaon OCP

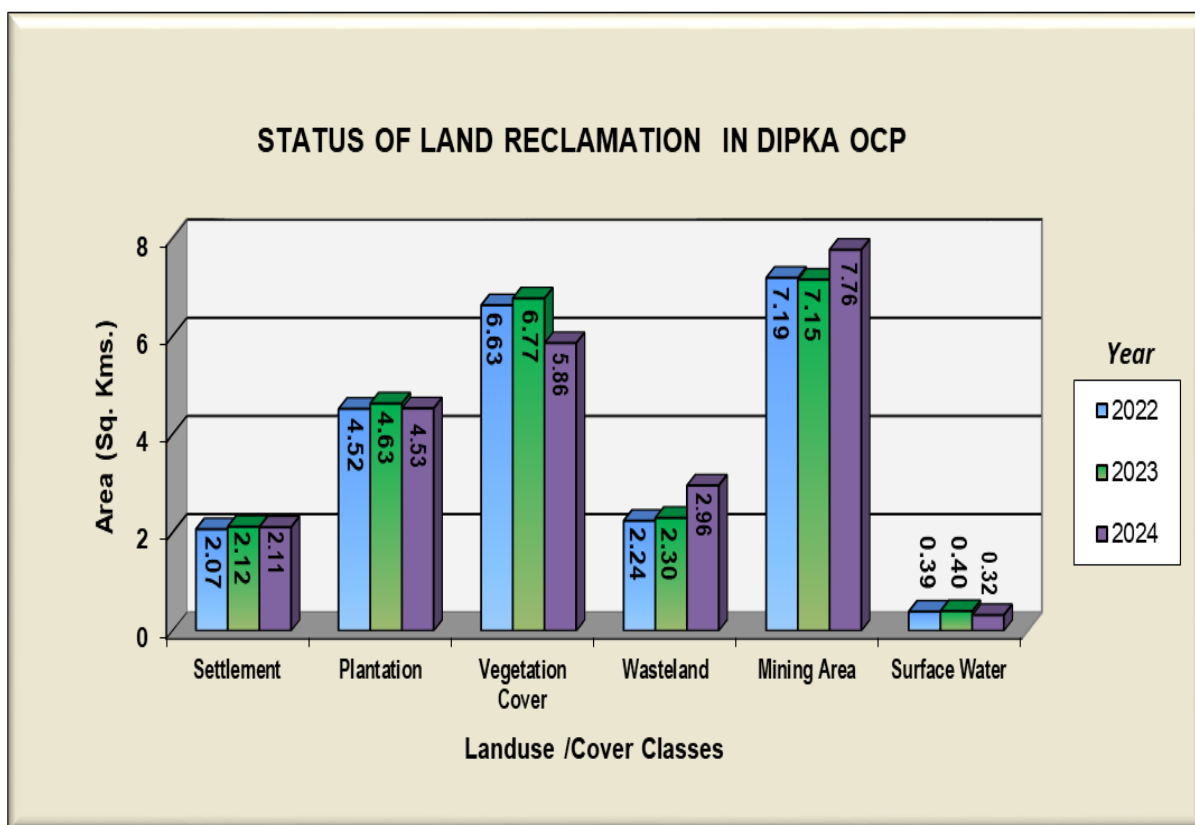


Chart 6.2: Status of Land Reclamation in Dipka OCP

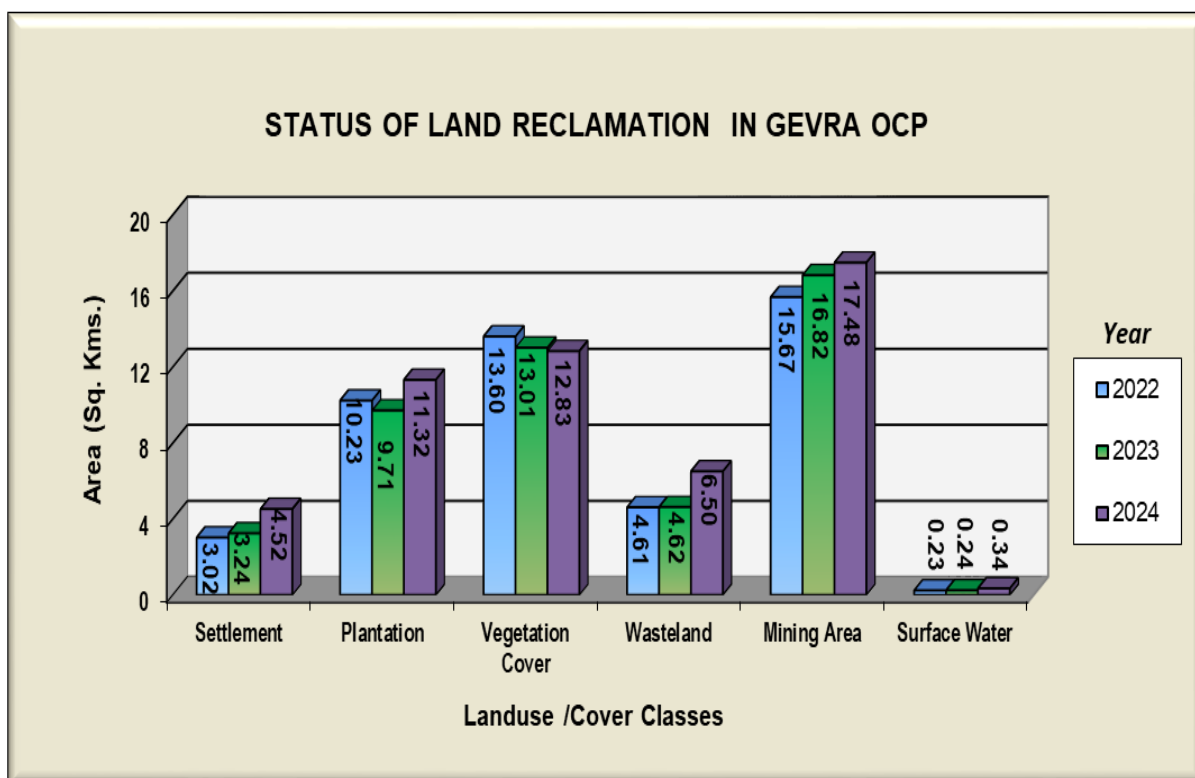


Chart 6.3: Status of Land Reclamation in Gevra OCP

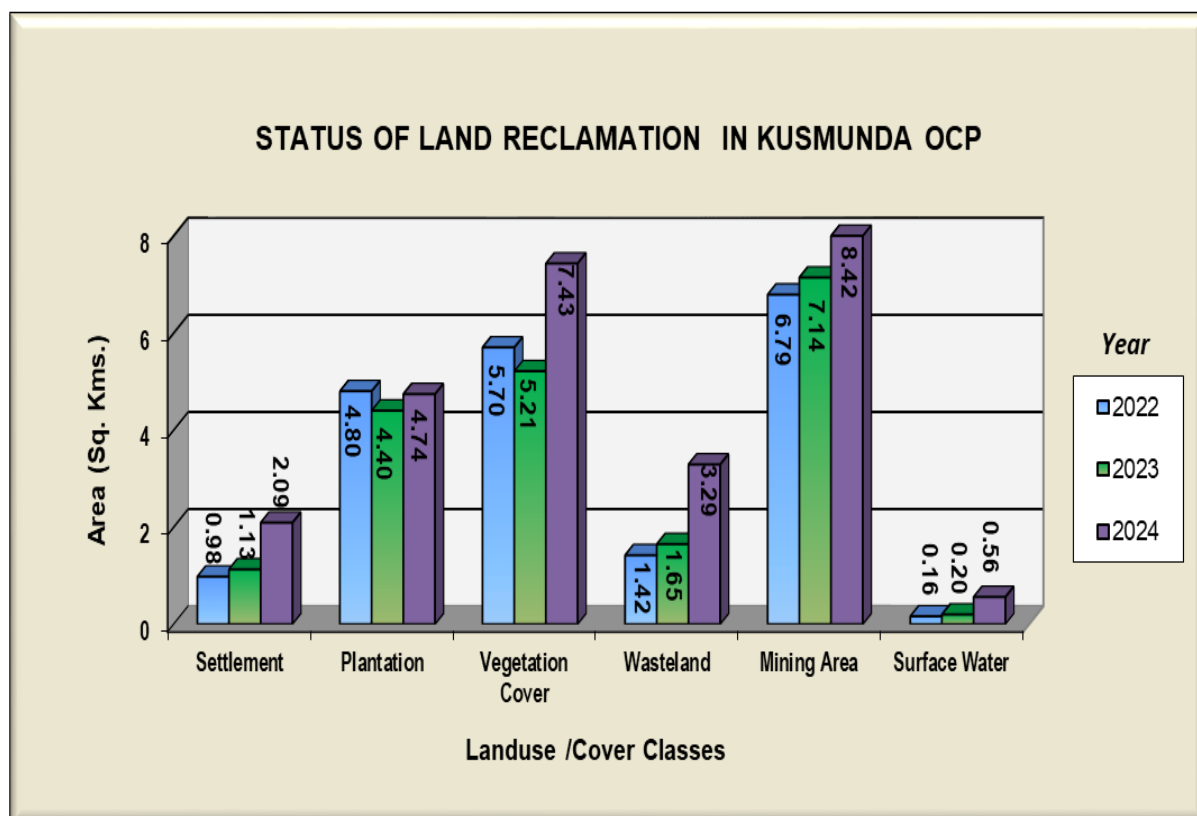


Chart 6.4: Status of Land Reclamation in Kusmunda OCP

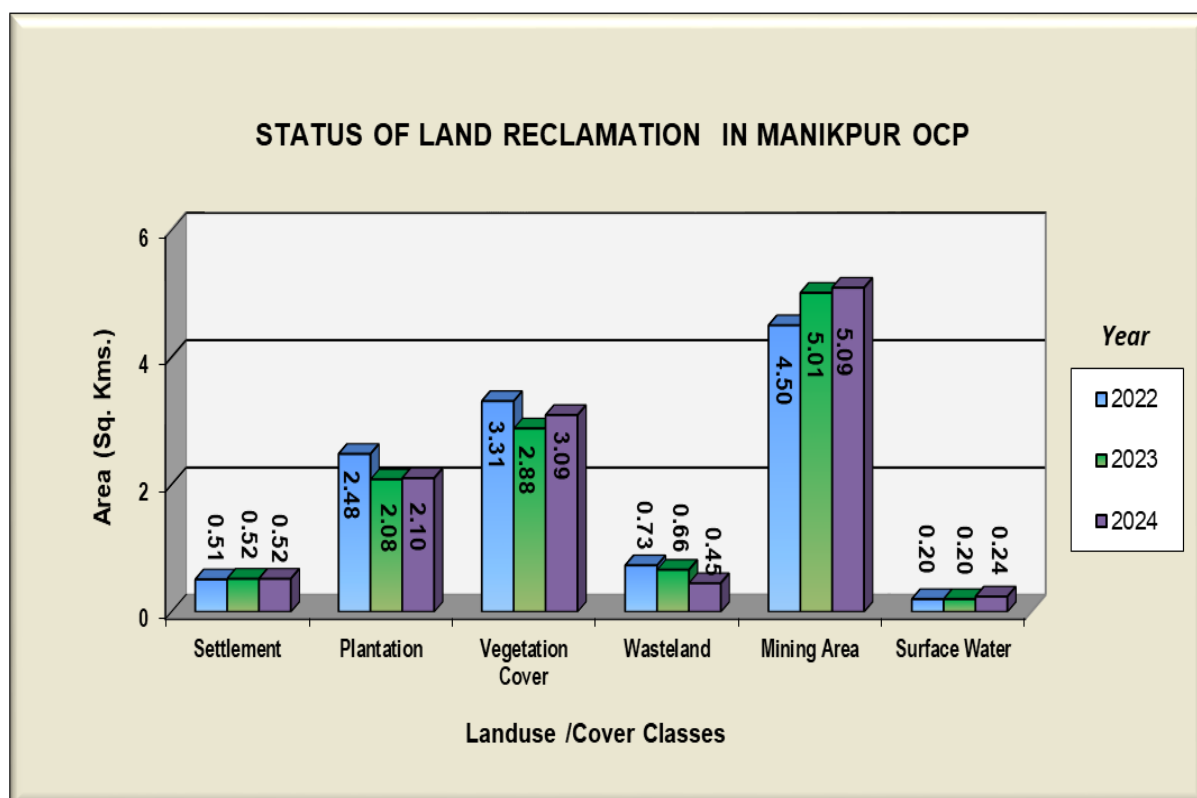


Chart 6.5: Status of Land Reclamation in Manikpur OCP

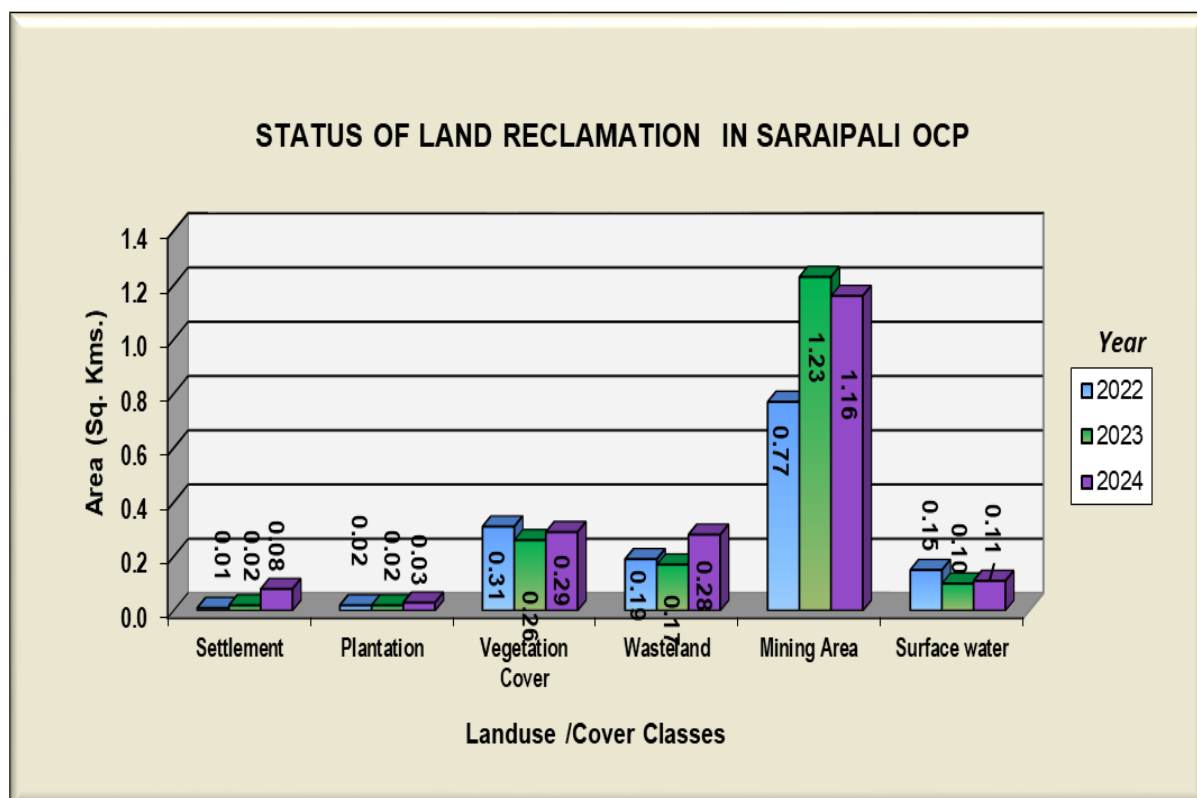


Chart 6.6: Status of Land Reclamation in Saraipali OCP

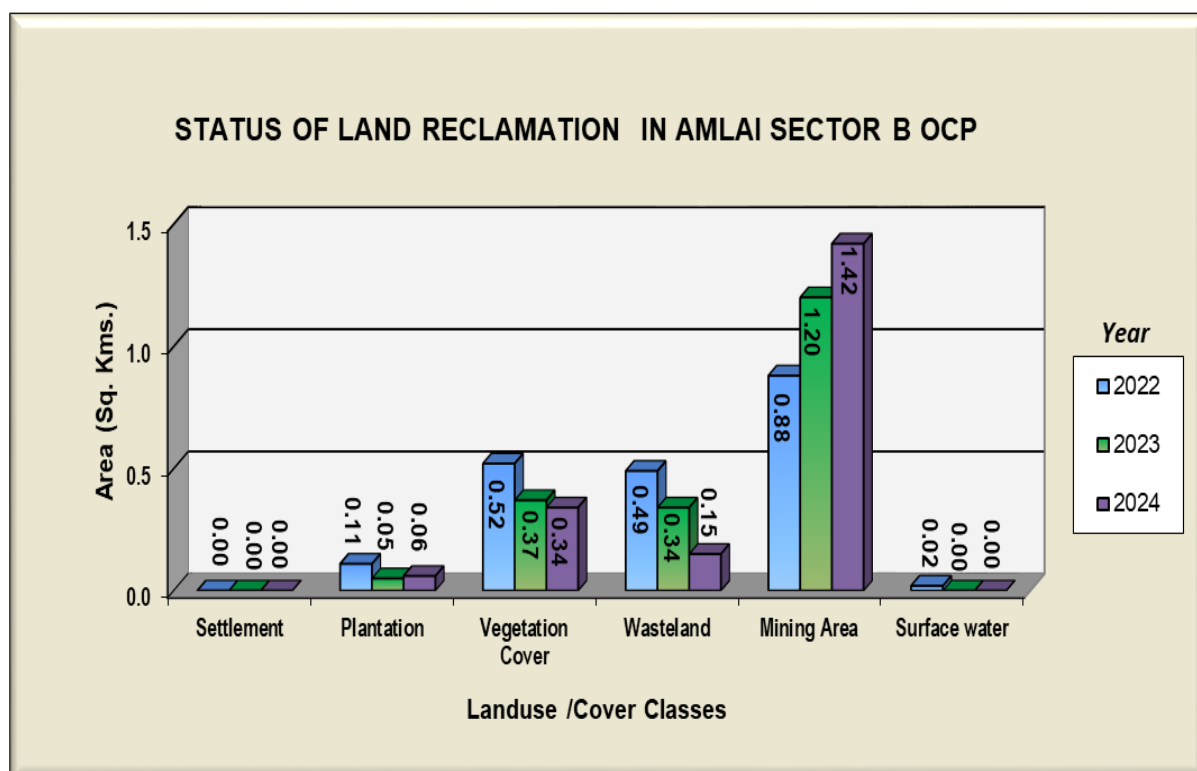


Chart 6.7: Status of Land Reclamation in Amlai Sector B OCP

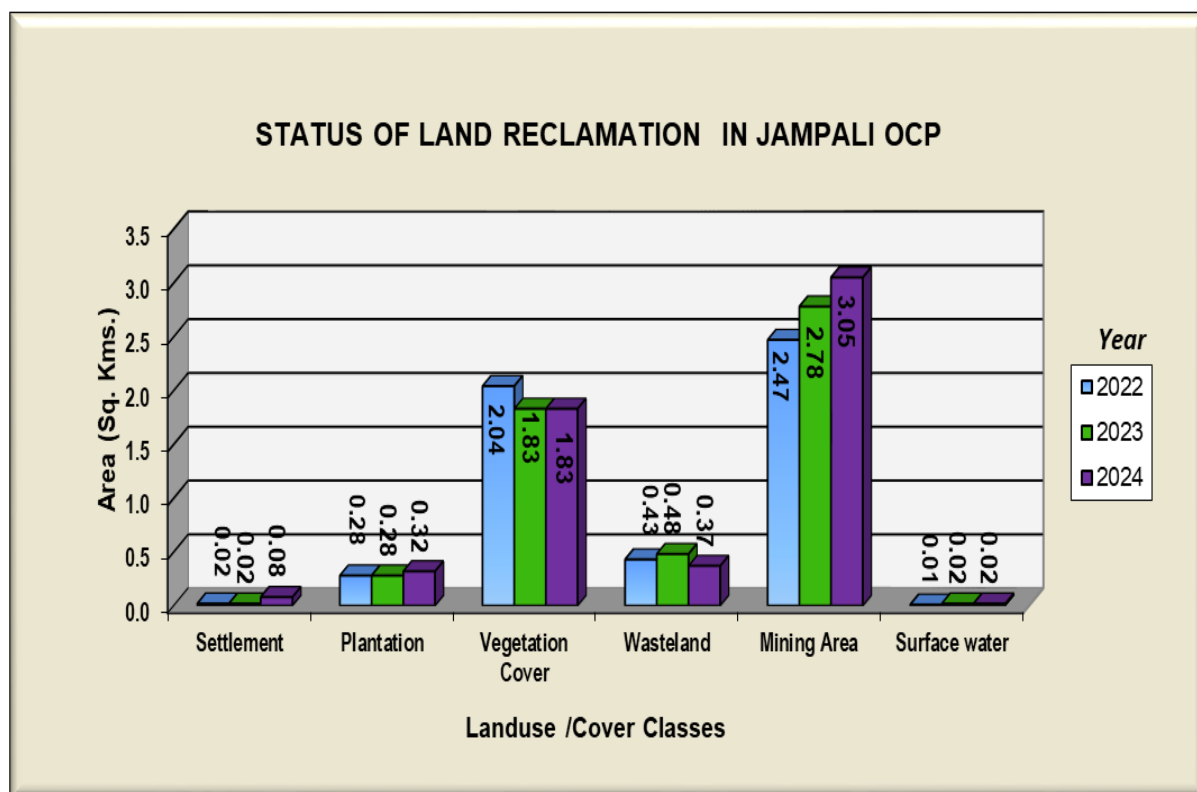


Chart 6.8: Status of Land Reclamation in Jampali OCP

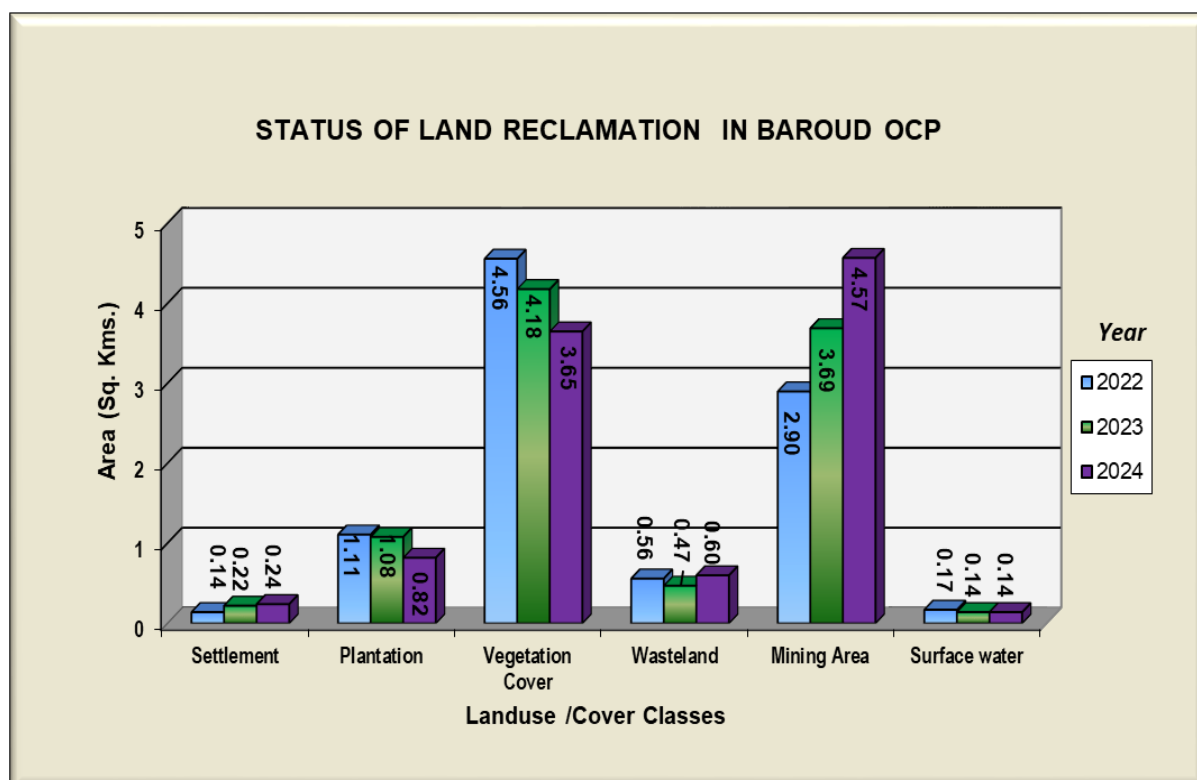


Chart 6.9: Status of Land Reclamation in Baroud OCP

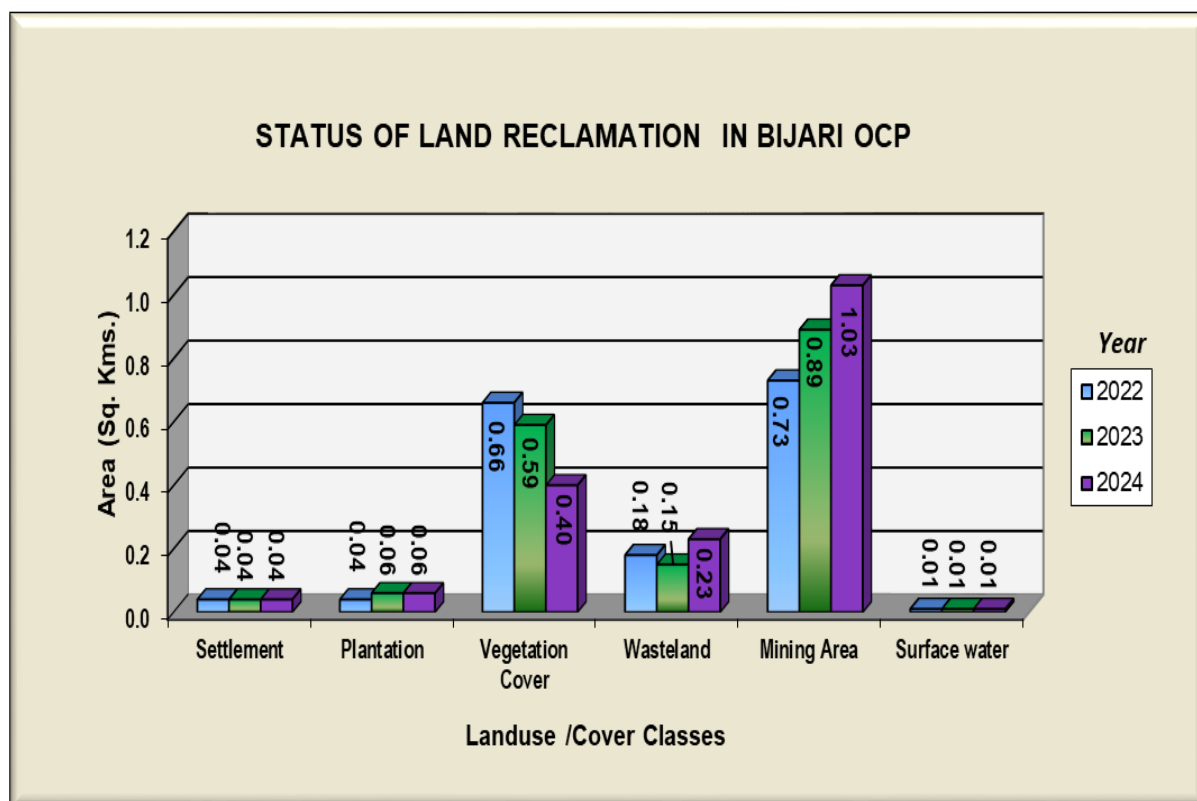


Chart 6.10: Status of Land Reclamation in Bijari OCP

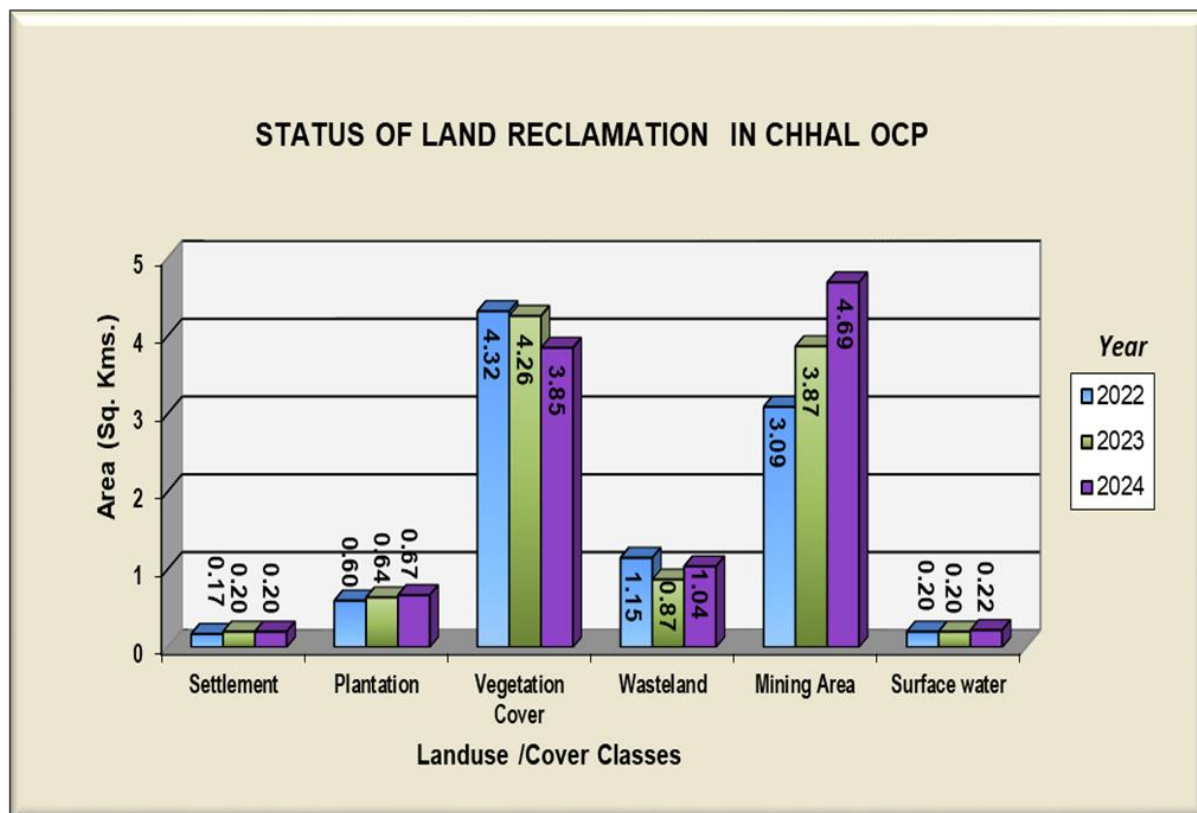


Chart 6.11: Status of Land Reclamation in Chhal OCP

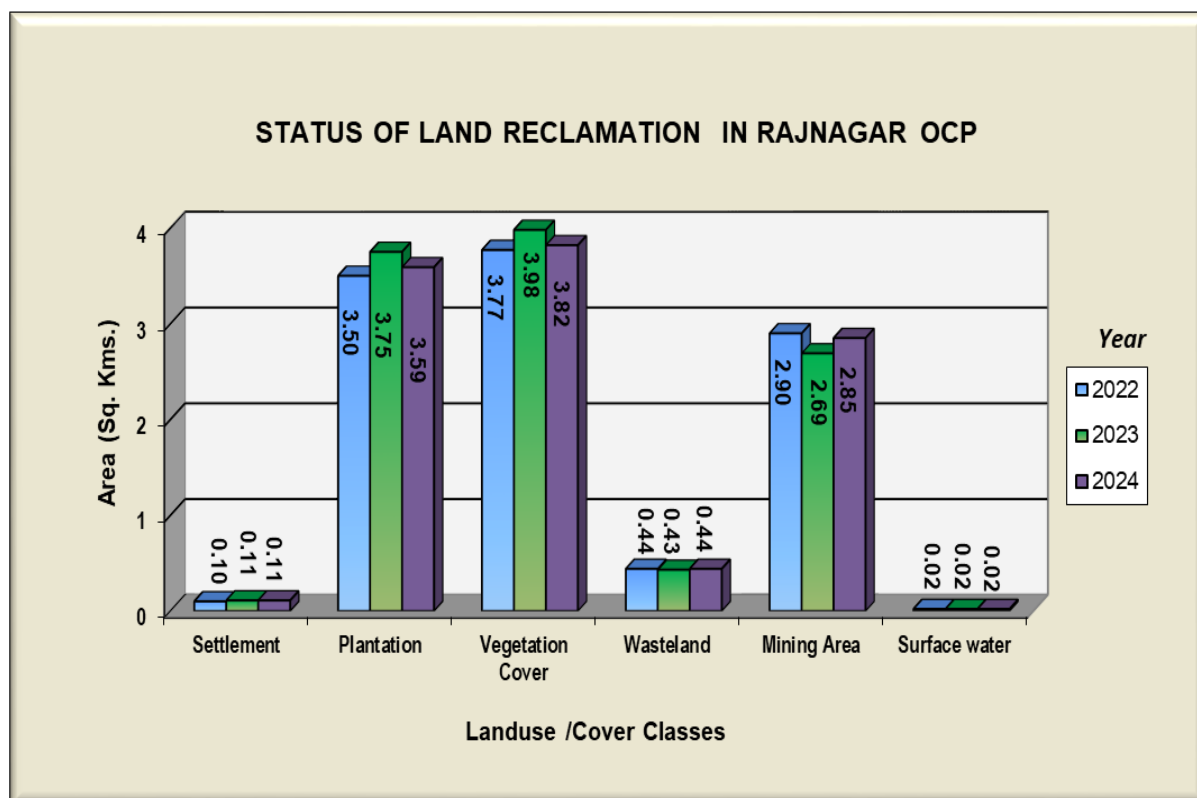


Chart 6.12: Status of Land Reclamation in Rajnagar OCP

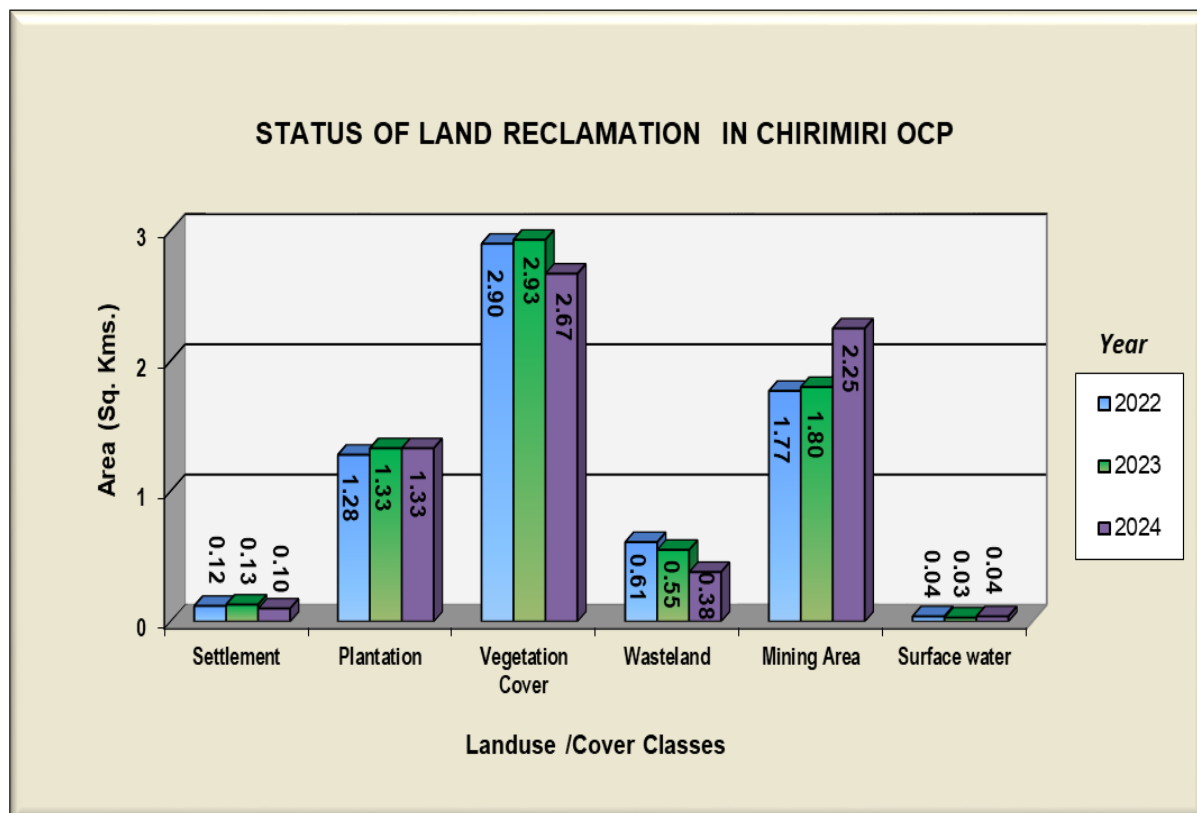


Chart 6.13: Status of Land Reclamation in Chirimiri OCP

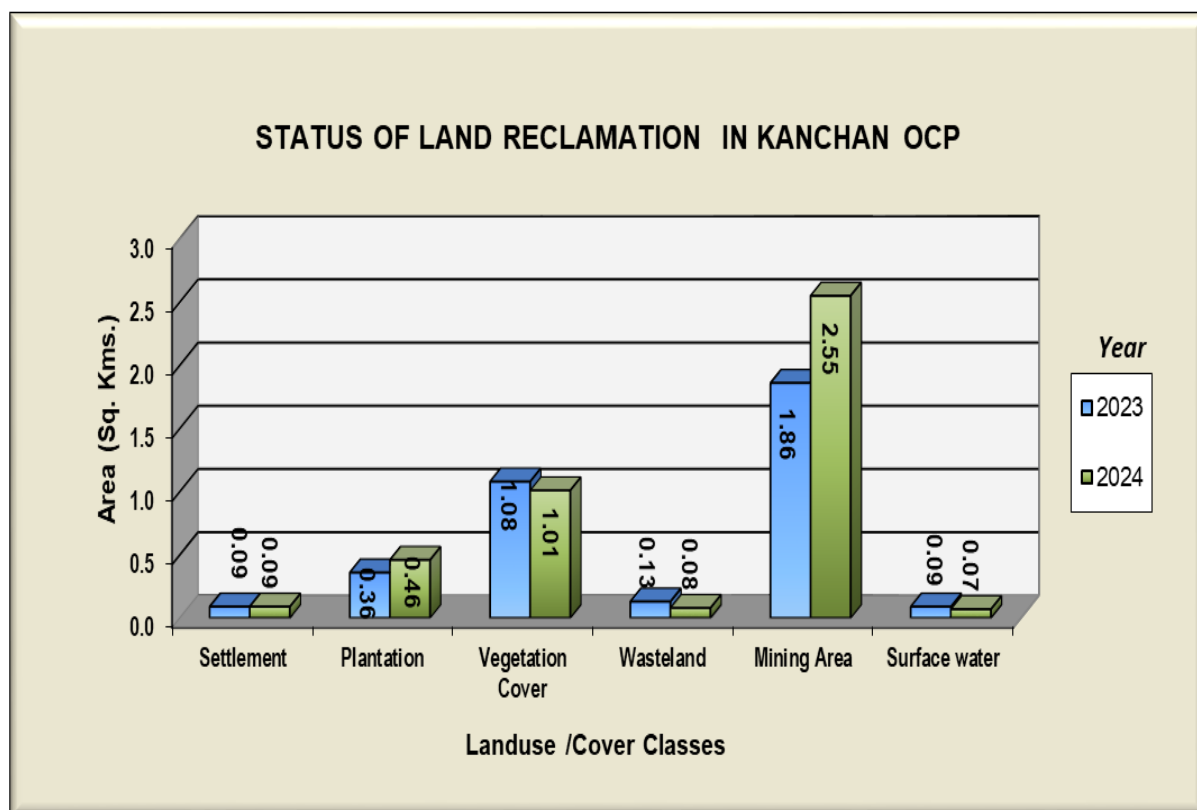


Chart 6.14: Status of Land Reclamation in Kanchan OCP

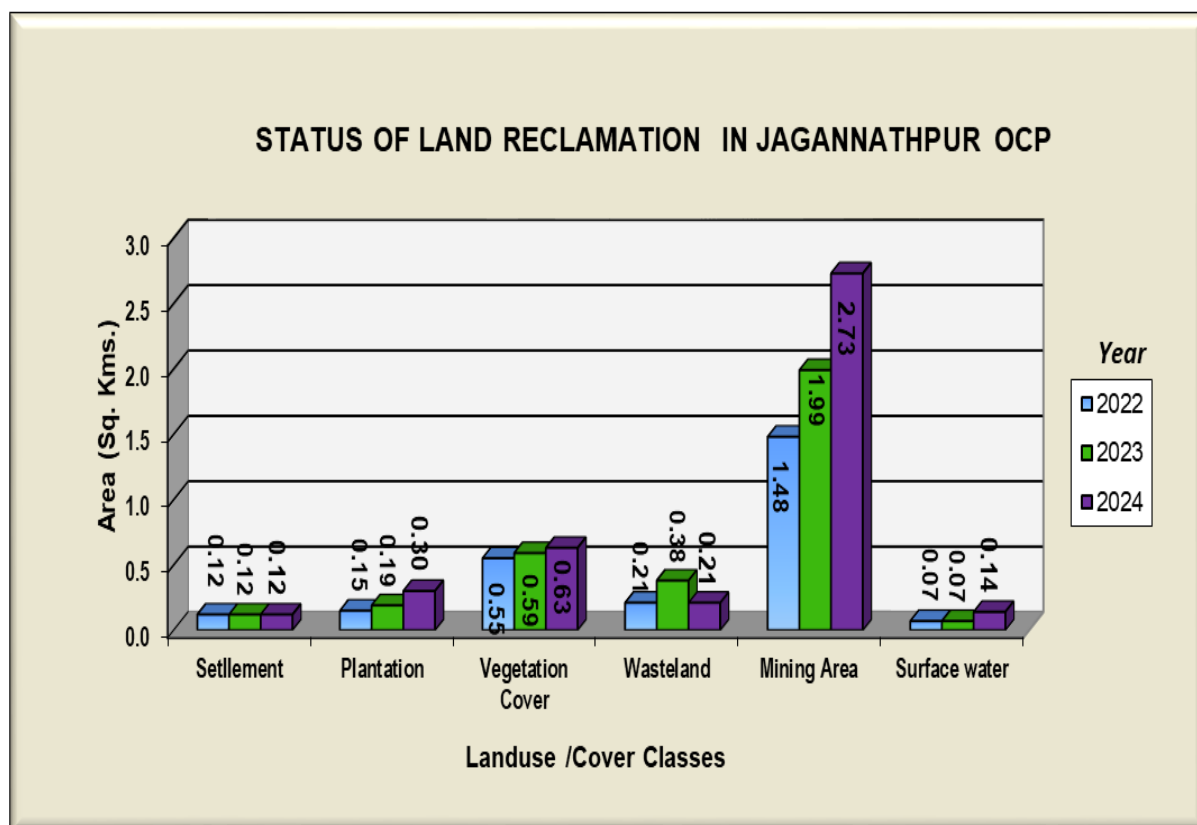


Chart 6.15: Status of Land Reclamation in Jagannathpur OCP

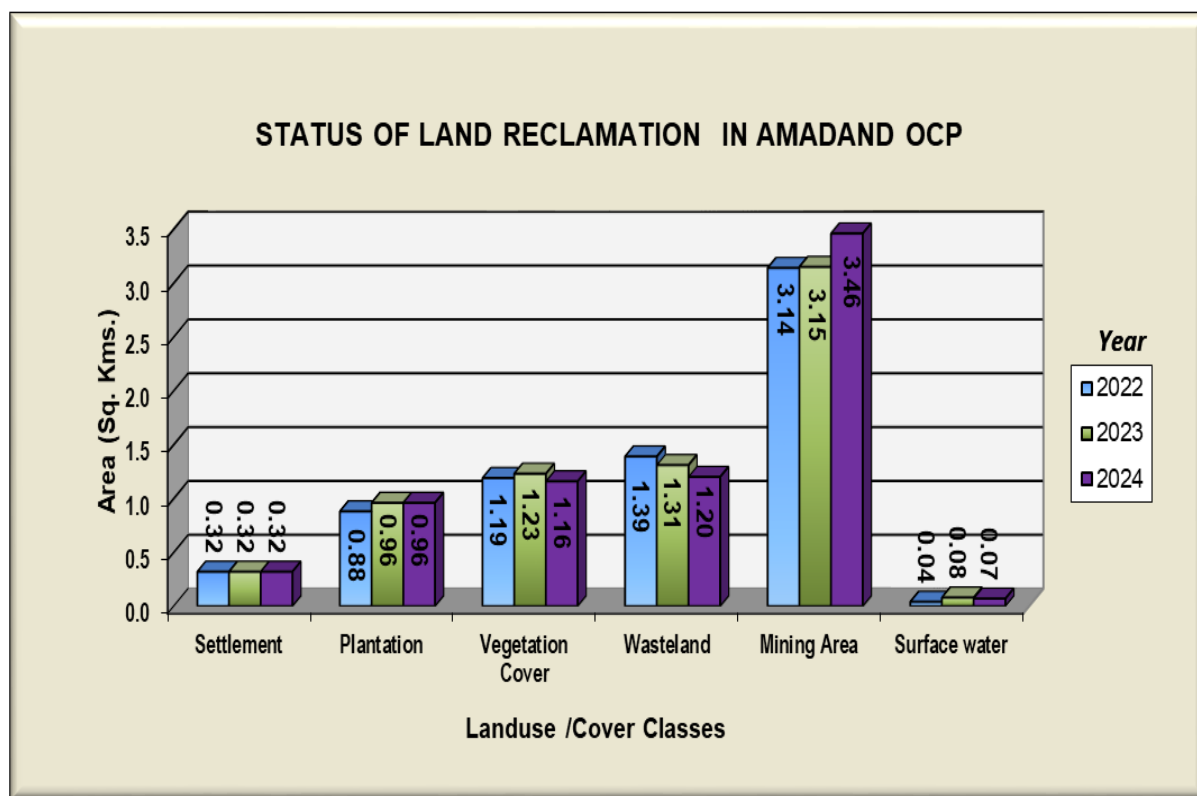


Chart 6.16: Status of Land Reclamation in Amadand OCP

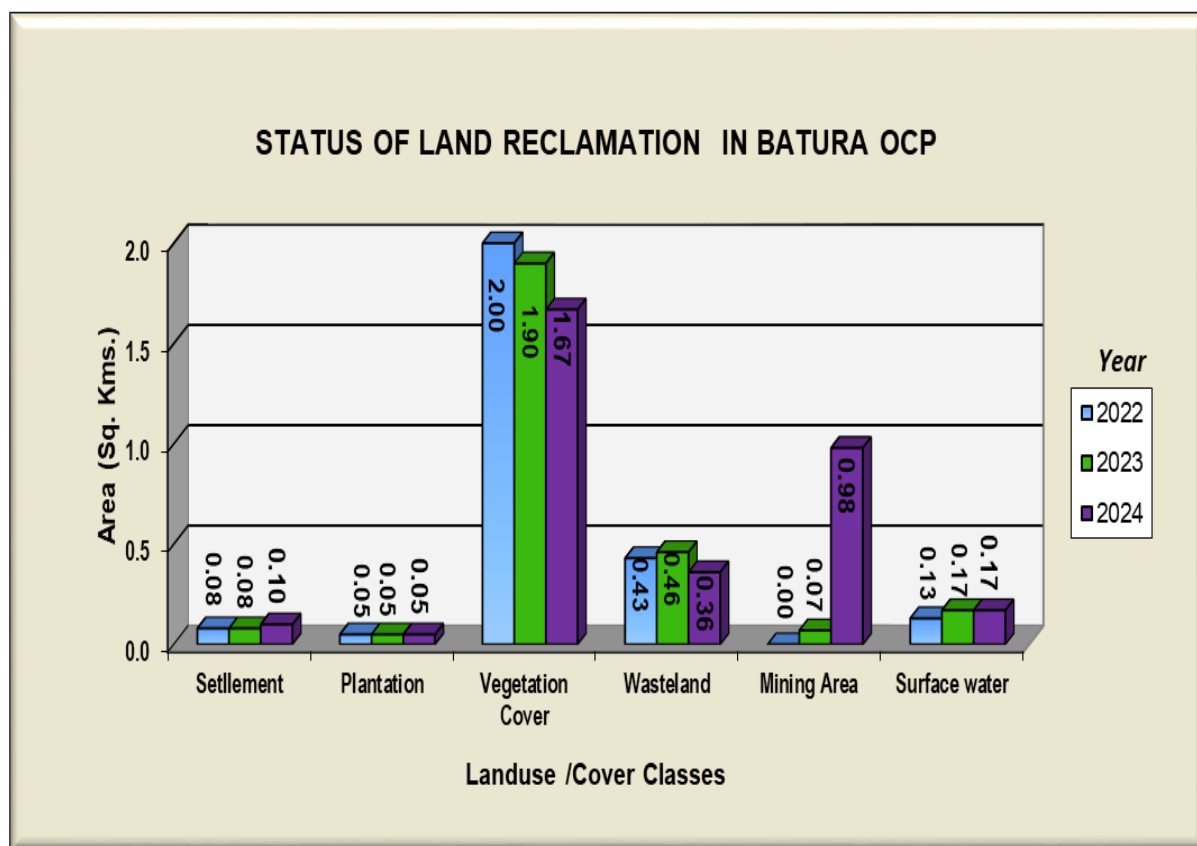


Chart 6.17: Status of Land Reclamation in Batura OCP

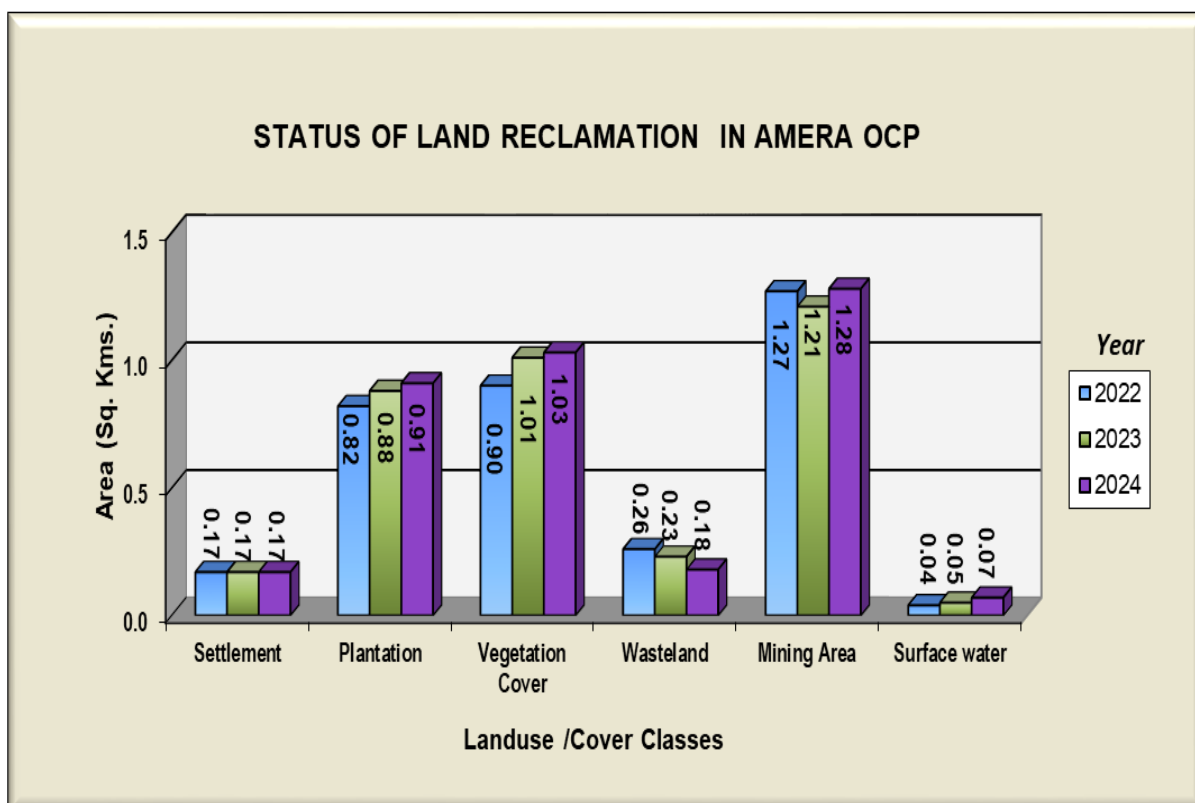


Chart 6.18: Status of Land Reclamation in Amera OCP

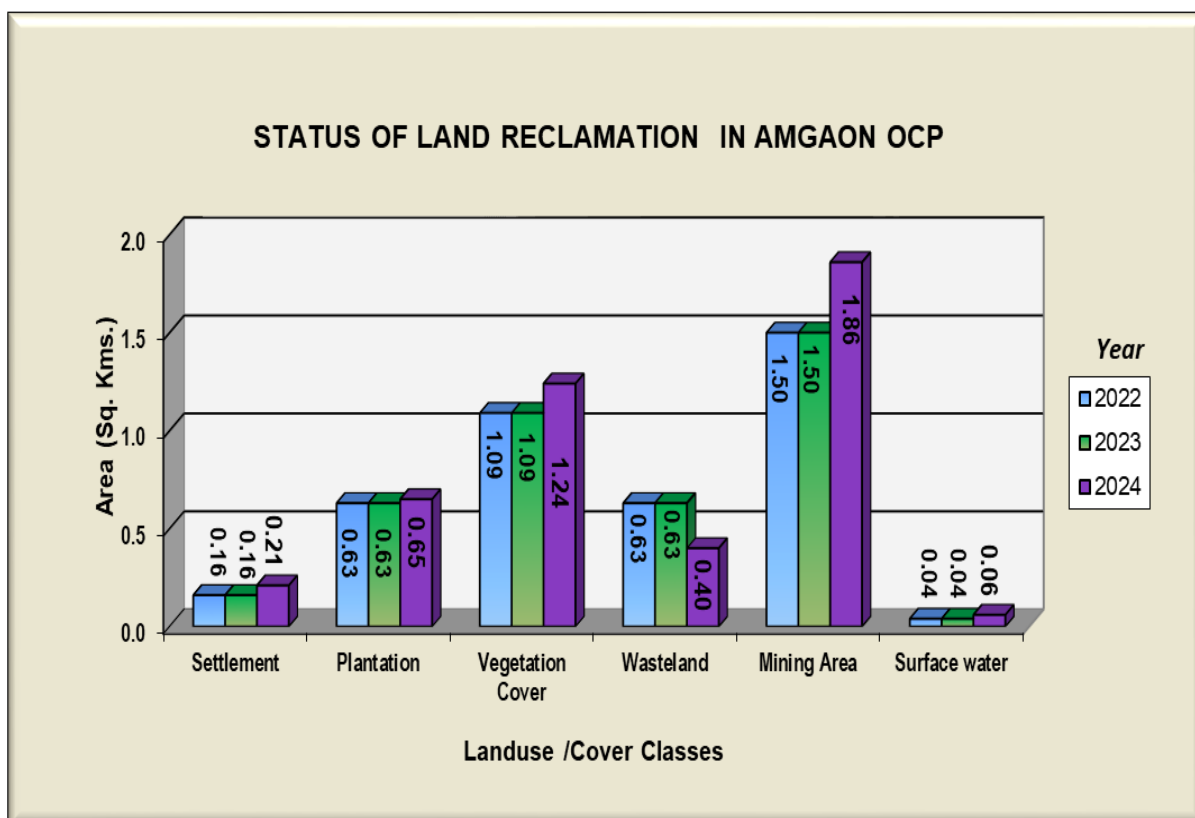


Chart 6.19: Status of Land Reclamation in Amgaon OCP



Photo 6.1: Plantation on Backfill in Dipka Opencast Project



Photo 6.2: Plantation on OB in Dipka Opencast Project



Photo 6.3: Miyawaki Plantation in Gevra Opencast Project



Photo 6.4: Plantation in Gevra Opencast Project



Photo 6.5: Overview of Kusmunda Opencast Project



Photo 6.6: Plantation on OB in Kusmunda Opencast Project



Photo 6.7: Plantation on Backfill of Manikpur Opencast Project



Photo 6.8: Plantation in Manikpur Opencast Project



Photo 6.9: Overview of Saraipali Opencast Project



Photo 6.10: Plantation on OB in Saraipali Opencast Project



Photo 6.11: Plantation in Amlai Sector B Opencast Project



Photo 6.12: Plantation in Jampali Opencast Project



Photo 6.13: Overview of Jampali Opencast Project



Photo 6.14: Grassing in Baroud Opencast Project



Photo 6.15: Plantation in Baroud Opencast Project



Photo 6.16: Overview of Bijari Opencast Project



Photo 6.17: Overview of Chhal Opencast Project



Photo 6.18: Plantation in Chhal Opencast Project



Photo 6.19: Plantation in Rajnagar Project



Photo 6.20: Plantation in Chirimiri Opencast Project



Photo 6.21: Plantation in Chirimiri Opencast Project



Photo 6.22: Overview of Kanchan Opencast Project



Photo 6.23: Plantation in Kanchan Opencast Project



Photo 6.24: Safety zone plantation in Jagannathpur Opencast Project



Photo 6.25: Overview of Amadand Opencast Project



Photo 6.26: Plantation in Amadand Opencast Project



Photo 6.27: Overview of Batura Opencast Project



Photo 6.28: Plantation in safety zone of Batura Opencast Project



Photo 6.29: Plantation in Amera Opencast Project

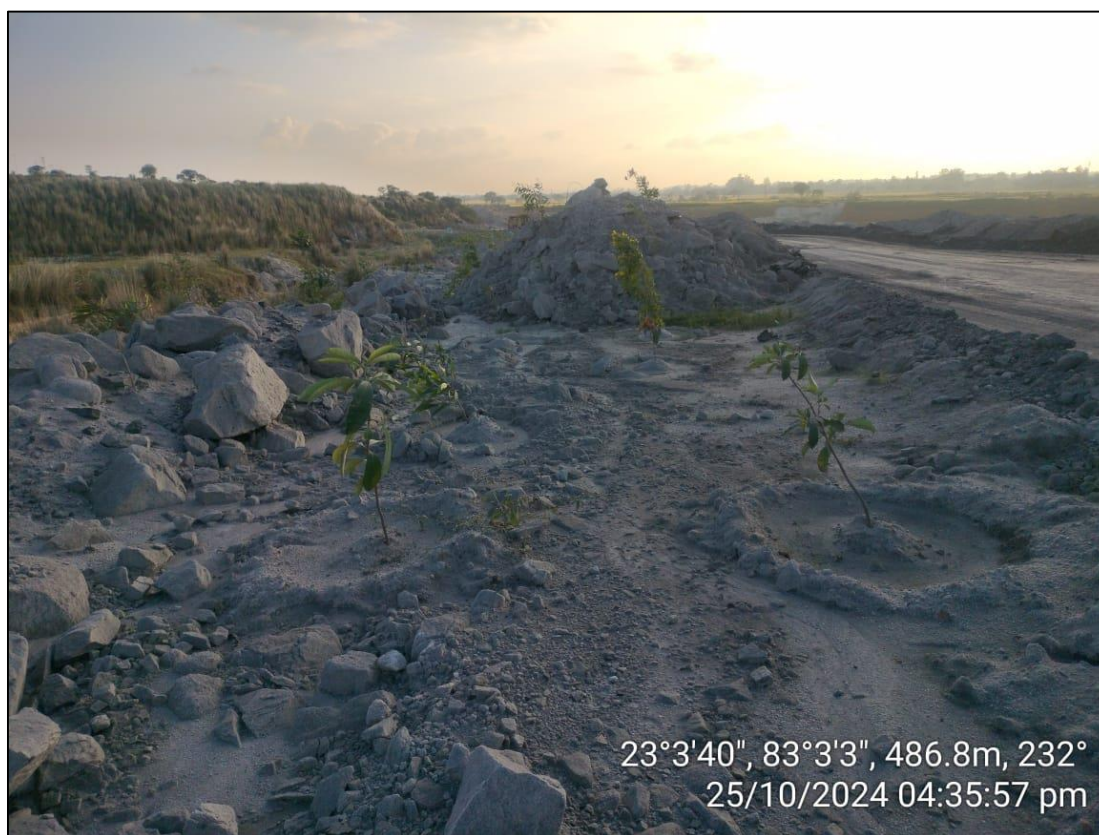


Photo 6.30: Plantation in Amera Opencast Project



Photo 6.31: Plantation in Amgaon Opencast Project

NORTHERN COALFIELDS LIMITED

7. Land Reclamation Status in Northern Coalfields Ltd

7.1 Following 10 OC projects producing more than 5 million cubic m. (Coal + OB together) of Northern Coalfields Ltd. have been taken up for land reclamation monitoring based on satellite data of the year 2024:

- Amlohri
- Nigahi
- Jayant
- Dudhichua
- Khadia
- Krishnashila
- Bina
- Kakri
- Jhingurdah
- Block-B

7.2 Project wise Land Reclamation status in NCL for the year 2024 is given in Table 7.1 and also shown graphically in Fig 7.1. Area statistics of different land use / cover classes present in the mine leasehold of the above projects for the year 2024 are shown in the Table – 7.2. Land use/cover maps derived from satellite data are shown in Plate 7.1 –7.10. Land reclamation status of the above mentioned 10 projects were prepared regularly since 2008. Year wise changes in the different land use classes based on satellite data for the last three years are depicted in Bar Charts in Fig. 7.2 to 7.11.

7.3 Study reveals that out of total excavated area of 88.01 Km², 55.59 Km² (63.16%) of area is under reclamation out of which 40.92 Km² (46.49%) area is under backfilling (Technical Reclamation) and 14.67 Km² (16.67%) area has been revegetated (Biological Reclamation). There is an increase of 2.96 Km² for area under reclamation in NCL in the year 2024 with respect to the year 2023. This increase is due to effort towards environment by NCL.

7.4 After analyzing the satellite data of year 2024 vs. 2023, it is evident that area under plantation (biological reclamation) has increased from 14.43 km² in 2023 to 14.67 km² in 2024, while reduced marginally in Amlohri project due to new solar park establishment.

7.5 Study also reveal that area under barren backfilling (Technical Reclamation) has increased from 38.20 km² in 2023 to 40.92 km² in 2024. All the 10 projects of NCL selected for monitoring are showing an increasing trend in technical reclamation except Block B in which class values are decreased marginally.

7.6 It was also observed that total area under plantation (Green Cover) has increased from 56.24 km² in 2023 to 57.03 km² in 2024. In the projects of NCL selected for monitoring all (except in Amlohri and Jhingurdah) projects are showing an increasing trend in Green Cover in their leasehold.

7.7 Projects under UP state i.e. Khadia, Krishnashila, Bina & Kakri have adopted new Miyawaki Plantation method in which each Hectare covers 35000 plants for dense forest growth. This method shows several species of trees which were planted together in sequence manner closely.

7.8 Study also reveals that area under active mining is increased from 32.22 Km² (Year 2023) to 32.42 Km² (Year 2024). In Jhingurdah project some mining area has become naturally vegetated and mining is going for deeper seams while in Kakri, Bina and Krishnashila the backfilling advances in active mining area. In these projects, mining of upper seam is near to complete and deeper seams are being excavated. Same situation is in Amlohri project is arising as backfilling is advancing over active mining area.

7.9 Out of 10 projects of NCL, , maximum land reclamation has been carried out in Krishnshilla (76.28%) followed by Bina (72.86%) and Jayant (65.02%).

Table 7.1: Summarized Land Reclamation Status in NCL
Summarized Land Reclamation Status in Opencast Projects of NCL based on Satellite Data of the year 2024

Summary of Land Reclamation Status in Operational Projects of Coal based on Current Data of the year 2021																			
(Projects producing more than 5 mcm of Coal+OB annually)																			
(Area in Sq. Kms.)																			
Sl No.	Project	Total Leasehold Area(2023)	Total Leasehold Area(2024)	Technical Reclamation		Plantation						Area under Active Mining		Total Excavated Area		Total Area under Plantation (% Green Cover Generated in Leasehold)		Total Area under Reclamation	
						Biological		Other Plantations											
				Area under Backfilling		Plantation on Excavated / Backfilled Area		Plantation on External Over Burden Dumps		Social Forestry, Avenue Plantation Etc.									
1	2	3		4		5		6		7		8		9 (=4+5+8)		10 (=5+6+7)		11(=4+5)	
				2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024
1	Amlohri	21.75	21.75	4.85	5.10	0.80	0.65	1.97	2.09	4.80	4.80	3.86	4.03	9.51	9.78	7.57	7.54	5.65	5.75
				51.00%	52.15%	8.41%	6.65%					40.59%	41.21%			34.80%	34.67%	59.41%	58.79%
2	Nigahi	30.18	30.18	5.46	5.53	2.50	2.50	3.48	3.52	2.90	2.89	4.82	5.40	12.78	13.43	8.88	8.91	7.96	8.03
				42.72%	41.18%	19.56%	18.62%					37.72%	40.21%			29.42%	29.52%	62.28%	59.79%
3	Jayant	31.77	31.77	6.26	6.49	4.58	4.70	3.71	3.71	4.31	4.28	5.58	6.02	16.42	17.21	12.60	12.69	10.84	11.19
				38.12%	37.71%	27.89%	27.31%					33.98%	34.98%			39.66%	39.94%	66.02%	65.02%
4	Dudhichua	23.91	23.91	6.09	6.17	1.77	1.85	2.23	2.20	0.42	0.41	4.69	5.25	12.55	13.27	4.42	4.46	7.86	8.02
				48.53%	46.50%	14.10%	13.94%					37.37%	39.56%			18.49%	18.65%	62.63%	60.44%
5	Khadia	16.40	16.40	4.77	5.02	1.05	1.07	0.42	0.68	2.25	2.44	3.30	3.36	9.12	9.45	3.72	4.19	5.82	6.09
				52.30%	53.12%	11.51%	11.32%					36.18%	35.56%			22.68%	25.55%	63.82%	64.44%
6	Krishnashila	8.52	8.52	2.58	3.15	0.64	0.71	1.30	1.67	0.06	0.06	1.66	1.20	4.88	5.06	2.00	2.44	3.22	3.86
				52.87%	62.25%	13.11%	14.03%					34.02%	23.72%			23.47%	28.64%	65.98%	76.28%
7	Bina	17.98	17.98	4.80	5.94	1.85	1.90	0.97	1.05	3.23	3.47	3.83	2.92	10.48	10.76	6.05	6.42	6.65	7.84
				45.80%	55.20%	17.65%	17.66%					36.55%	27.14%			33.65%	35.71%	63.45%	72.86%
8	Kakri	8.28	8.28	1.49	1.74	0.47	0.48	1.52	1.58	1.95	2.08	1.49	1.10	3.45	3.32	3.94	4.14	1.96	2.22
				43.19%	52.41%	13.62%	14.46%					43.19%	33.13%			47.58%	50.00%	56.81%	66.87%
9	Jhingurdah	12.00	12.00	0.00	0.00	0.00	0.00	3.70	2.40	1.53	1.50	1.26	1.25	1.26	1.25	5.23	3.90	0.00	0.00
				0.00%	0.00%	0.00%	0.00%					100.00%	100.00%			43.58%	32.50%	0.00%	0.00%
10	Block-B	13.39	13.39	1.90	1.78	0.77	0.81	0.87	1.35	0.19	0.18	1.73	1.89	4.40	4.48	1.83	2.34	2.67	2.59
				43.18%	39.73%	17.50%	18.08%					39.32%	42.19%			13.67%	17.48%	60.68%	57.81%
	TOTAL	184.18	184.18	38.20	40.92	14.43	14.67	20.17	20.25	21.64	22.11	32.22	32.42	84.85	88.01	56.24	57.03	52.63	55.59
				45.02%	46.49%	17.01%	16.67%					37.97%	36.84%	46.07%	47.78%	30.54%	30.96%	62.03%	63.16%
(% is calculated with respected to Excavated Area as applicable)																			

Note: In reference of the above Table-7.1, different parameters are classified as follows:

1. Area under **Biological Reclamation** includes Areas under Plantation done on Backfilled Area Only.
2. Area under **Technical Reclamation** includes Area under Barren Backfilling only
3. Area under Active Mining Includes Coal Quarry, Advance Quarry Site, Quarry filled with water etc.
4. Social Forestry and Plantation on External OB Dumps are not included in Biological Reclamation and are put under separate categories as shown in the Table above.
5. (%) calculated in the above Table is in respect to Total Excavated Area except for "Total Area under Plantation" where % is in terms of "Leasehold Area".

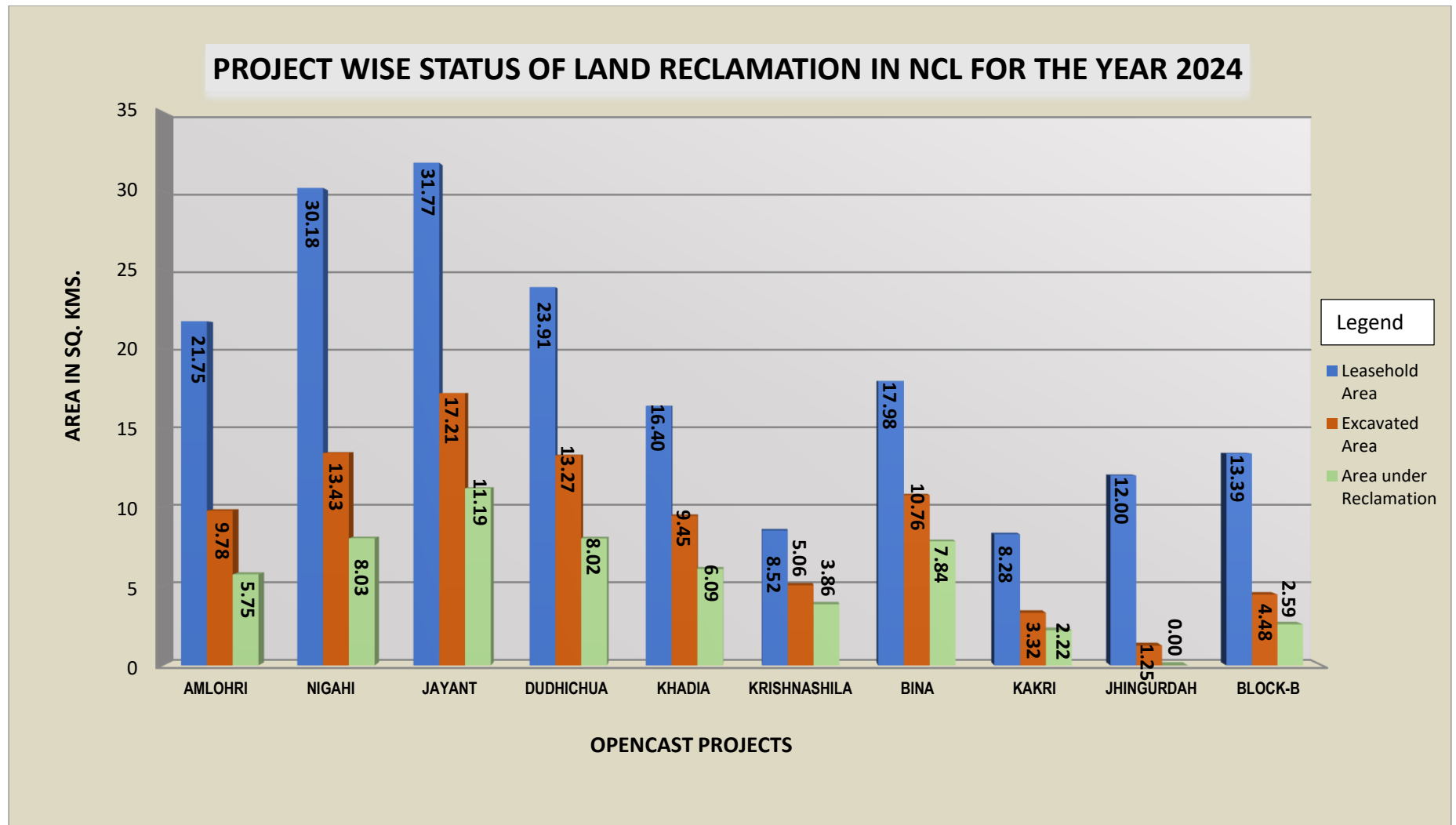


Chart 7.1: Bar Chart showing Land Reclamation Status in NCL

Table 7.2: Project-wise Land Reclamation Status in Opencast Projects of NCL (2024)

Status of Land Use / Reclamation in OC Mines producing more than 5 mcm (Coal+OB) annually of Northern Coalfields Ltd. based on Satellite data of the Year 2024																								
		AMLOHRI		NIGAH		JAYANT		DUDHICHUA		KHADIA		KRISHNASHILA		BINA		KAKRI		JHINGURDAH		BLOCK-B		TOTAL		
		Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	
FORESTS	Dense Forest		0.11	0.51	0.24	0.80	0.05	0.16	0.96	4.02	0.14	0.85	0.11	1.29	0.23	1.28	0.00	0.00	0.03	0.25	0.09	0.67	1.96	1.06
	Open Forest		0.02	0.09	2.53	8.38	0.54	1.70	3.01	12.58	0.88	5.37	0.27	3.17	0.49	2.73	0.00	0.00	1.61	13.42	0.58	4.33	9.93	5.39
	Total Forest		0.13	0.60	2.77	9.18	0.59	1.86	3.97	16.60	1.02	6.22	0.38	4.46	0.72	4.01	0.00	0.00	1.64	13.67	0.67	5.00	11.89	6.46
SOIL USE	Scrubs		0.06	0.28	0.41	1.36	1.31	4.12	1.68	7.03	0.07	0.43	0.28	3.29	0.29	1.61	0.08	0.97	0.58	4.83	0.75	5.61	5.51	2.99
PLANTATION	Social/Forestry		4.80	22.07	2.89	9.58	4.28	13.47	0.41	1.71	2.44	14.88	0.06	0.70	3.47	19.30	2.08	25.12	1.50	12.50	0.18	1.34	22.11	12.00
	Plantation on External/OB Dump		2.09	9.61	3.52	11.66	3.71	11.68	2.20	9.20	0.68	4.15	1.67	19.60	1.05	5.84	1.58	19.08	2.40	20.00	1.35	10.08	20.25	10.99
	Plantation on Backfill / Excavated Area (Biological Reclamation)		0.65	2.99	2.50	8.28	4.70	14.79	1.85	7.74	1.07	6.52	0.71	8.33	1.90	10.57	0.48	5.80	0.00	0.00	0.81	6.05	14.67	7.97
	Total Area under Plantation (Green Cover)		7.54	34.67	8.91	29.52	12.69	39.94	4.46	18.65	4.19	25.55	2.44	28.63	6.42	35.71	4.14	50.00	3.90	32.50	2.34	17.47	57.03	30.96
Total Vegetation			7.73	35.55	12.09	40.06	14.59	45.92	10.11	42.28	5.28	32.20	3.10	36.38	7.43	41.33	4.22	50.97	6.12	51.00	3.76	28.08	74.43	40.41
AREA UNDER ACTIVE MINING	Coal Quarry		2.67	12.28	3.63	12.03	5.03	15.83	4.07	17.02	2.79	17.01	0.72	8.45	1.59	8.84	0.79	9.54	1.20	10.00	1.38	10.31	23.87	12.96
	Coal Dump		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.17	0.02	0.24	0.00	0.00	0.00	0.00	0.05	0.03
	Advance Quarry Site		1.36	6.25	1.76	5.85	0.88	2.77	1.16	4.85	0.56	3.41	0.44	5.16	1.29	7.17	0.28	3.38	0.00	0.00	0.44	3.29	8.17	4.44
	Quarry Filled With Water		0.00	0.00	0.01	0.03	0.11	0.35	0.02	0.08	0.01	0.06	0.04	0.47	0.01	0.06	0.01	0.12	0.05	0.42	0.07	0.52	0.33	0.18
	Total Area under Active Mining		4.03	18.53	5.40	17.91	6.02	18.95	5.25	21.95	3.36	20.48	1.20	14.08	2.92	16.24	1.10	13.28	1.25	10.42	1.89	14.12	32.42	17.60
TECHNICAL RECLAMATION	Barren OB Dump		3.03	13.93	2.12	7.02	0.44	1.38	1.07	4.48	0.81	4.94	0.58	6.81	0.26	1.45	0.32	3.86	4.01	33.42	3.22	24.05	15.86	8.61
	Area under Barren Backfilling (Technical Reclamation)		5.10	23.45	5.53	18.32	6.49	20.43	6.17	25.81	5.02	30.62	3.15	36.97	5.94	33.03	1.74	21.02	0.00	0.00	1.78	13.29	40.92	22.22
	Total Area under Technical Reclamation		5.10	23.45	5.53	18.32	6.49	20.43	6.17	25.81	5.02	30.62	3.15	36.97	5.94	33.03	1.74	21.02	0.00	0.00	1.78	13.29	40.92	22.22
	Total Area under Mining Operations		12.16	55.91	13.05	43.25	12.95	40.76	12.49	52.24	9.19	56.04	4.93	57.86	9.12	50.72	3.16	38.16	5.26	43.84	6.89	51.46	89.20	48.43
WASTELANDS	Waste Lands		0.24	1.10	1.29	4.27	0.54	1.70	0.55	2.30	0.42	2.56	0.28	3.29	0.35	1.95	0.14	1.69	0.24	2.00	1.21	9.04	5.26	2.86
	Fly Ash Pond / Sand Body		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total Wasteland		0.24	1.10	1.29	4.27	0.54	1.70	0.55	2.30	0.42	2.56	0.28	3.29	0.35	1.95	0.14	1.69	0.24	2.00	1.21	9.04	5.26	2.86
WATERBODIES	Reservoir, nallah, ponds		0.18	0.83	0.14	0.46	0.49	1.54	0.05	0.21	0.02	0.12	0.00	0.00	0.12	0.67	0.01	0.12	0.01	0.08	0.05	0.37	1.07	0.58
	Total Waterbodies		0.18	0.83	0.14	0.46	0.49	1.54	0.05	0.21	0.02	0.12	0.00	0.00	0.12	0.67	0.01	0.12	0.01	0.08	0.05	0.37	1.07	0.58
AGRICULTURE	Crop Lands		0.55	2.53	0.06	0.20	0.36	1.13	0.17	0.71	0.01	0.06	0.00	0.00	0.00	0.00	0.08	0.97	0.12	1.00	0.11	0.82	1.46	0.79
	Fallow Lands		0.19	0.87	0.34	1.13	0.24	0.76	0.13	0.54	0.01	0.06	0.00	0.00	0.00	0.00	0.03	0.36	0.02	0.17	1.16	8.66	2.12	1.15
	Total Agriculture		0.74	3.40	0.40	1.33	0.60	1.89	0.30	1.25	0.02	0.12	0.00	0.00	0.00	0.00	0.11	1.33	0.14	1.17	1.27	9.48	3.58	1.94
SETTLEMENTS	Urban Settlement		0.39	1.79	2.66	8.81	1.81	5.70	0.14	0.59	1.17	7.13	0.05	0.59	0.47	2.61	0.53	6.40	0.16	1.33	0.02	0.15	7.40	4.02
	Rural Settlement		0.19	0.87	0.04	0.13	0.39	1.23	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.33	0.00	0.00	0.00	0.00	0.00	0.68	0.37	
	Industrial Settlement		0.12	0.55	0.51	1.69	0.40	1.26	0.27	1.13	0.30	1.83	0.16	1.88	0.43	2.39	0.11	1.33	0.07	0.58	0.19	1.42	2.56	1.39
	Total Settlement		0.70	5.80	3.21	10.63	2.60	8.19	0.41	1.72	1.47	8.96	0.21	2.47	0.96	5.33	0.64	7.73	0.23	1.91	0.21	1.57	10.64	5.78
Grand Total			21.75	100.00	30.18	100.00	31.77	100.00	23.91	100.00	16.40	100.00	8.52	100.00	17.98	100.00	8.28	100.00	12.00	100.00	13.39	100.00	184.18	100.00

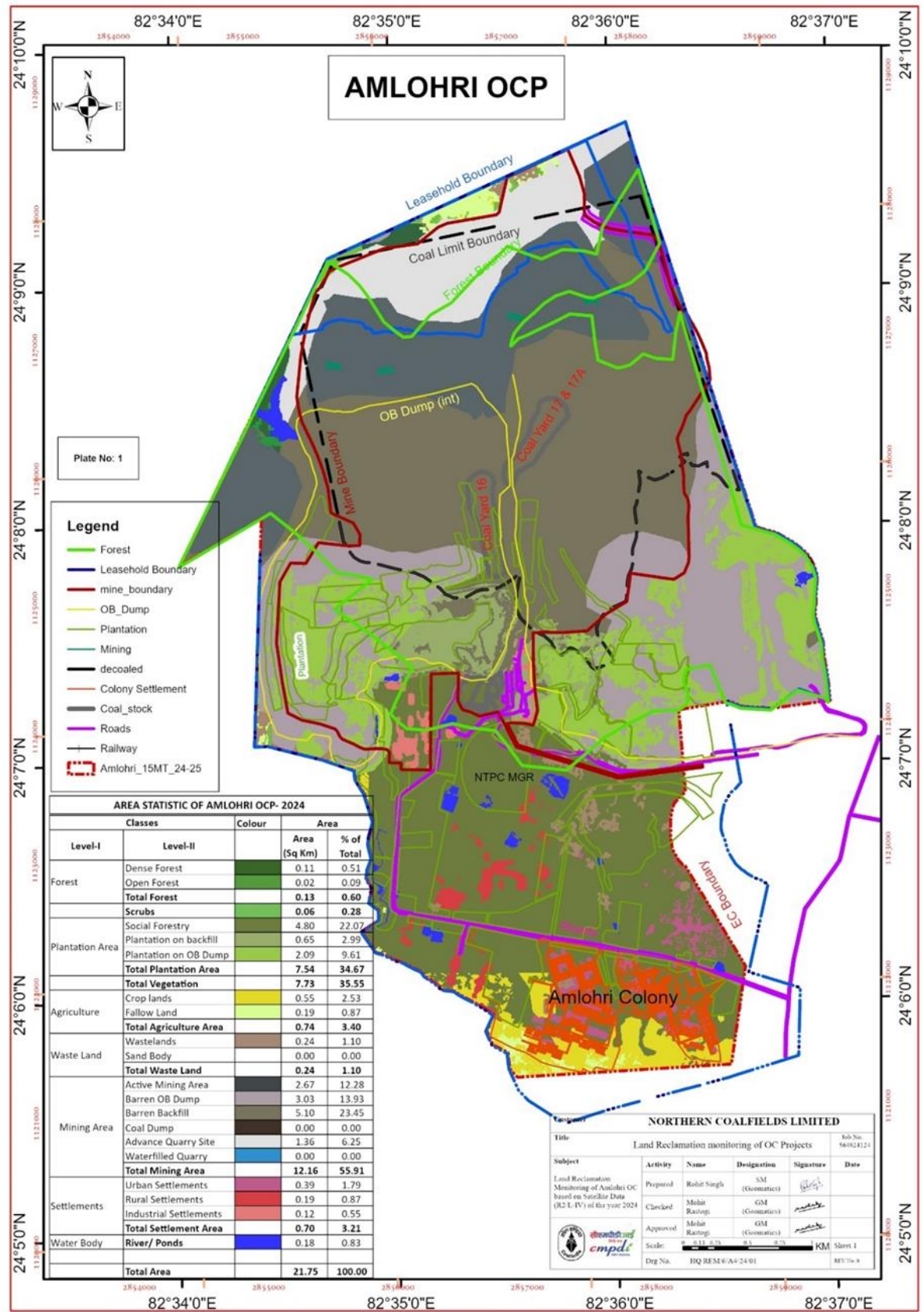


Plate 7-1: Land Use/Cover map of Amlohri OCP

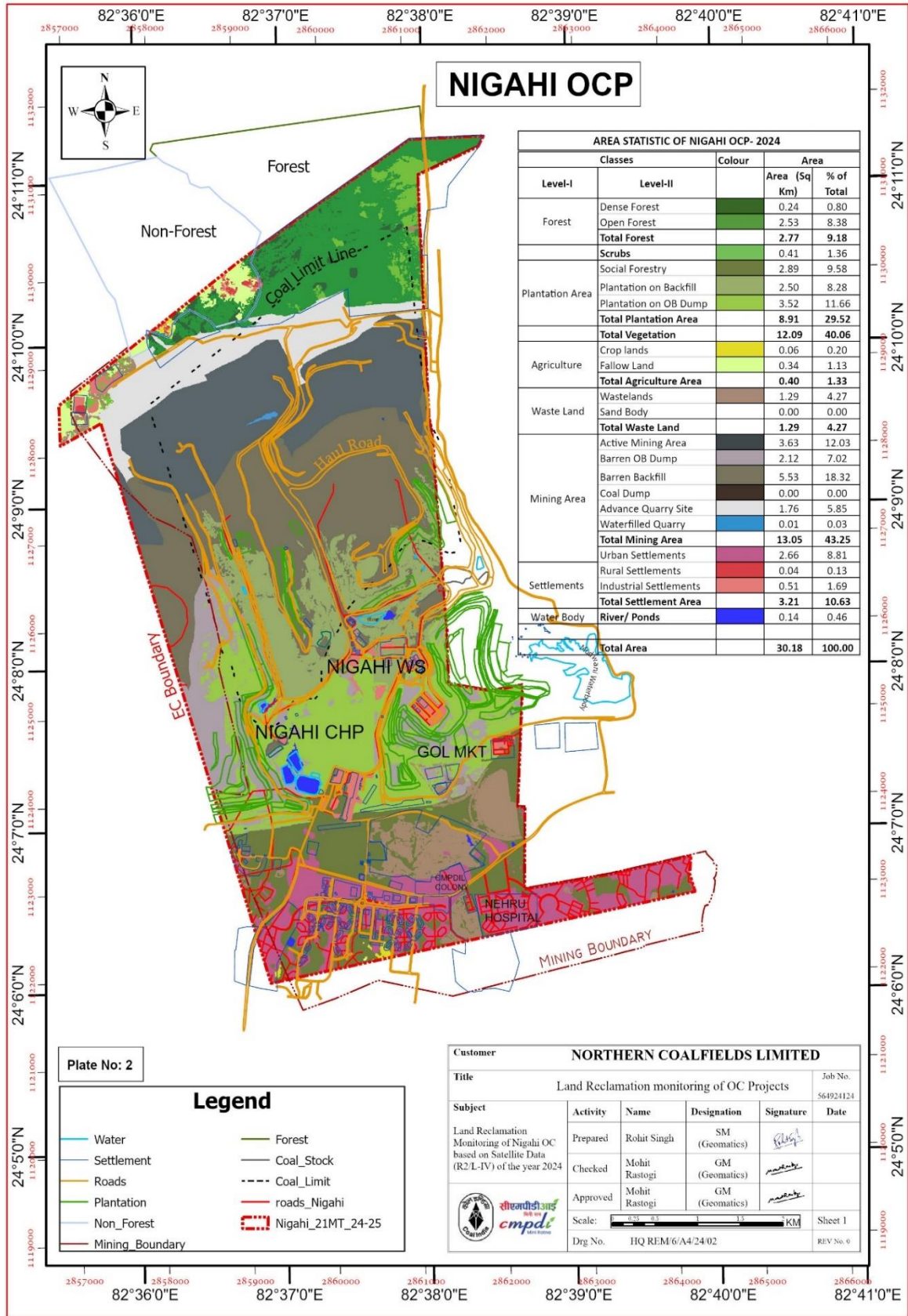


Plate 7-2: Land Use/Cover map of Nigahi OCP

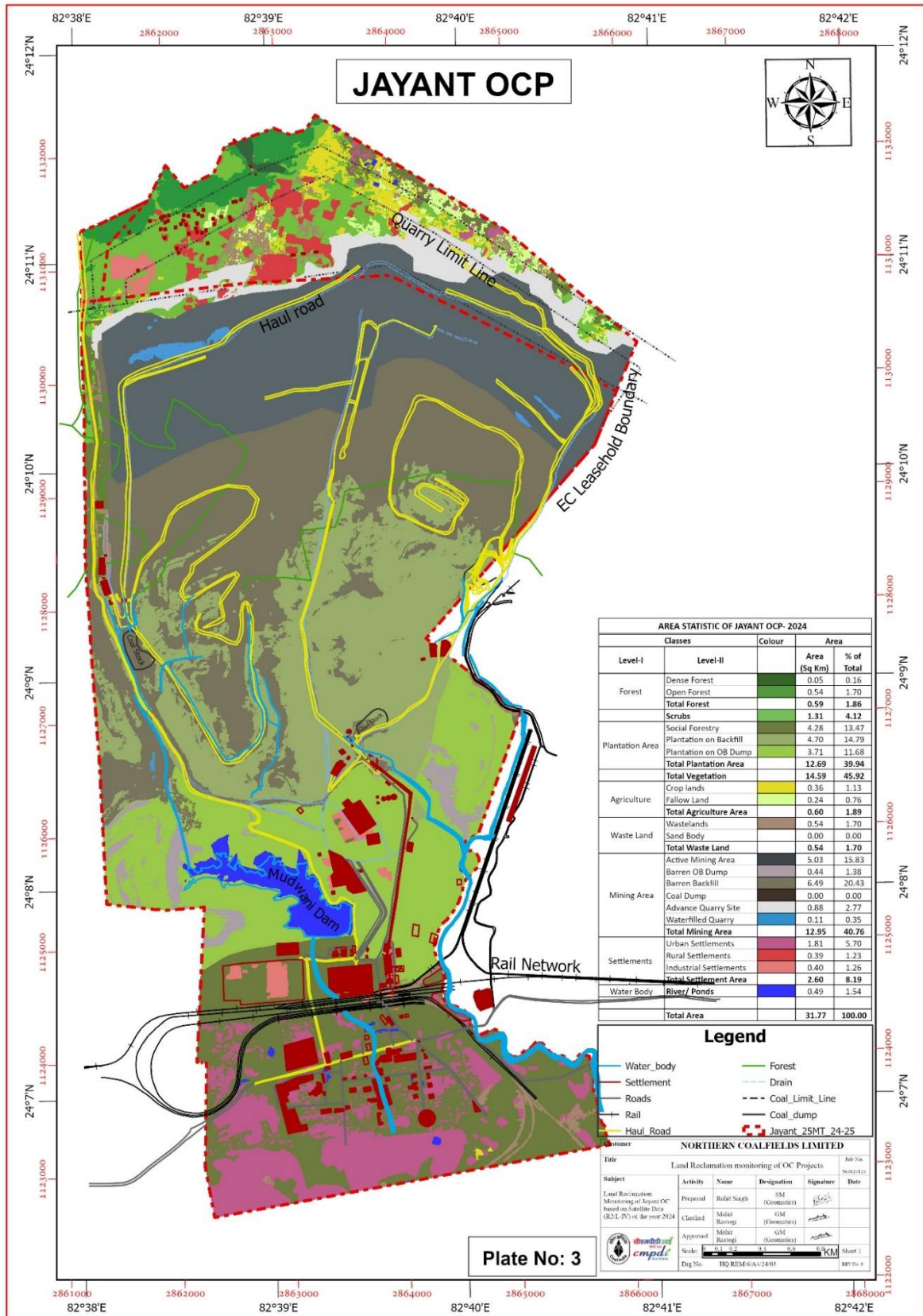


Plate 7-3: Land Use/Cover map of Jayant OCP

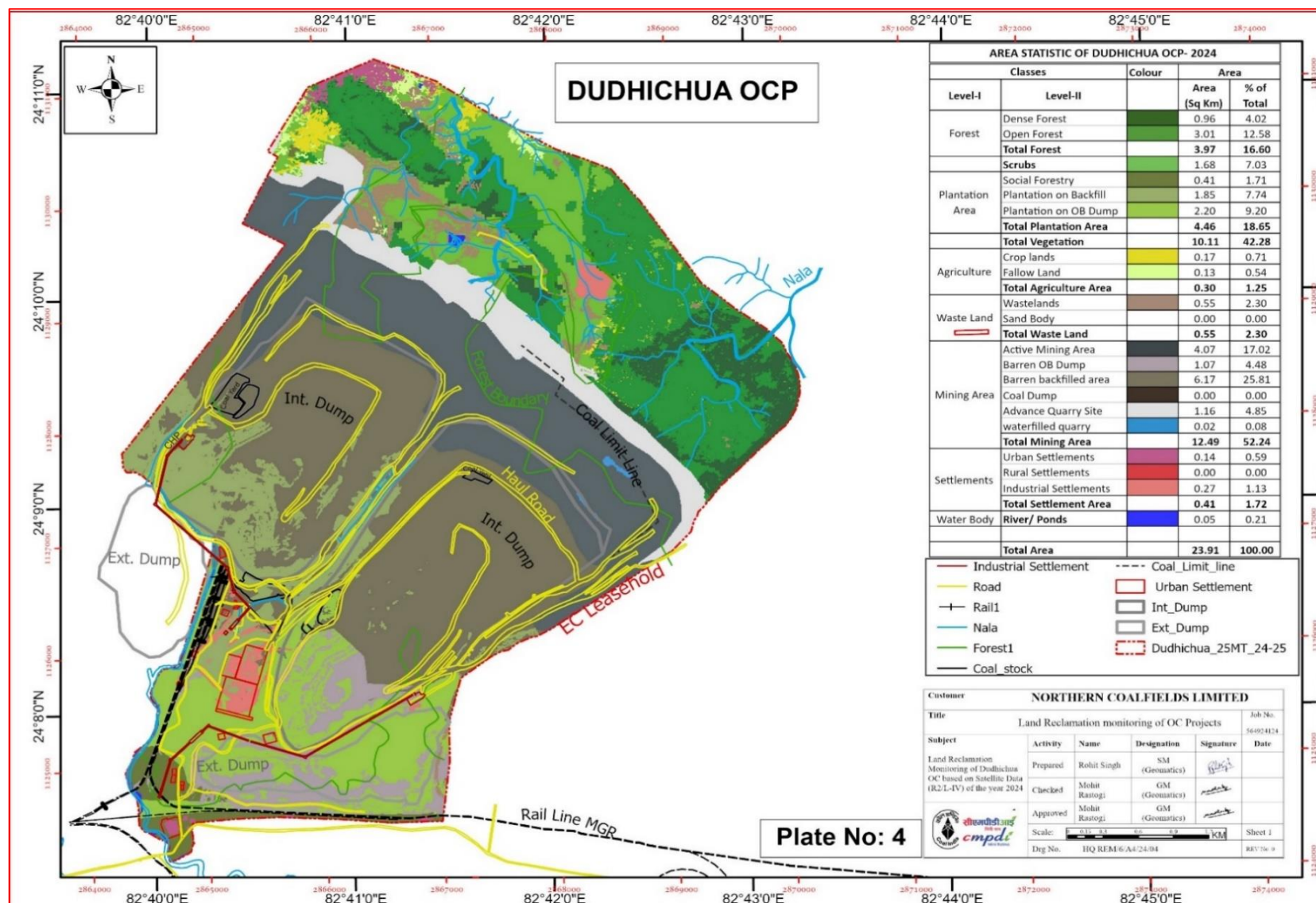


Plate 7-4: Land Use/Cover map of Dudhichua OCP

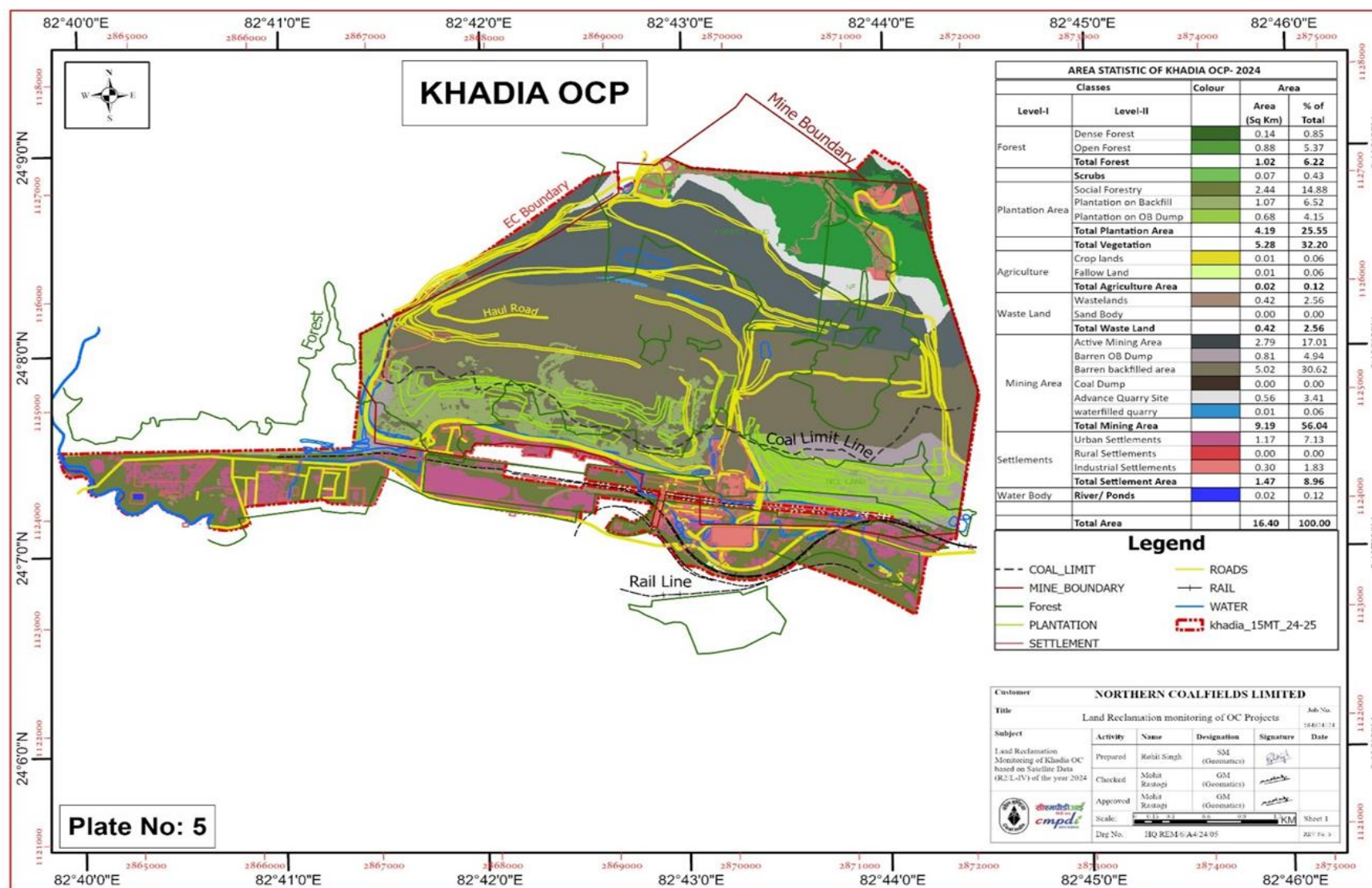


Plate 7-5: Land Use/Cover map of Khadia OCP

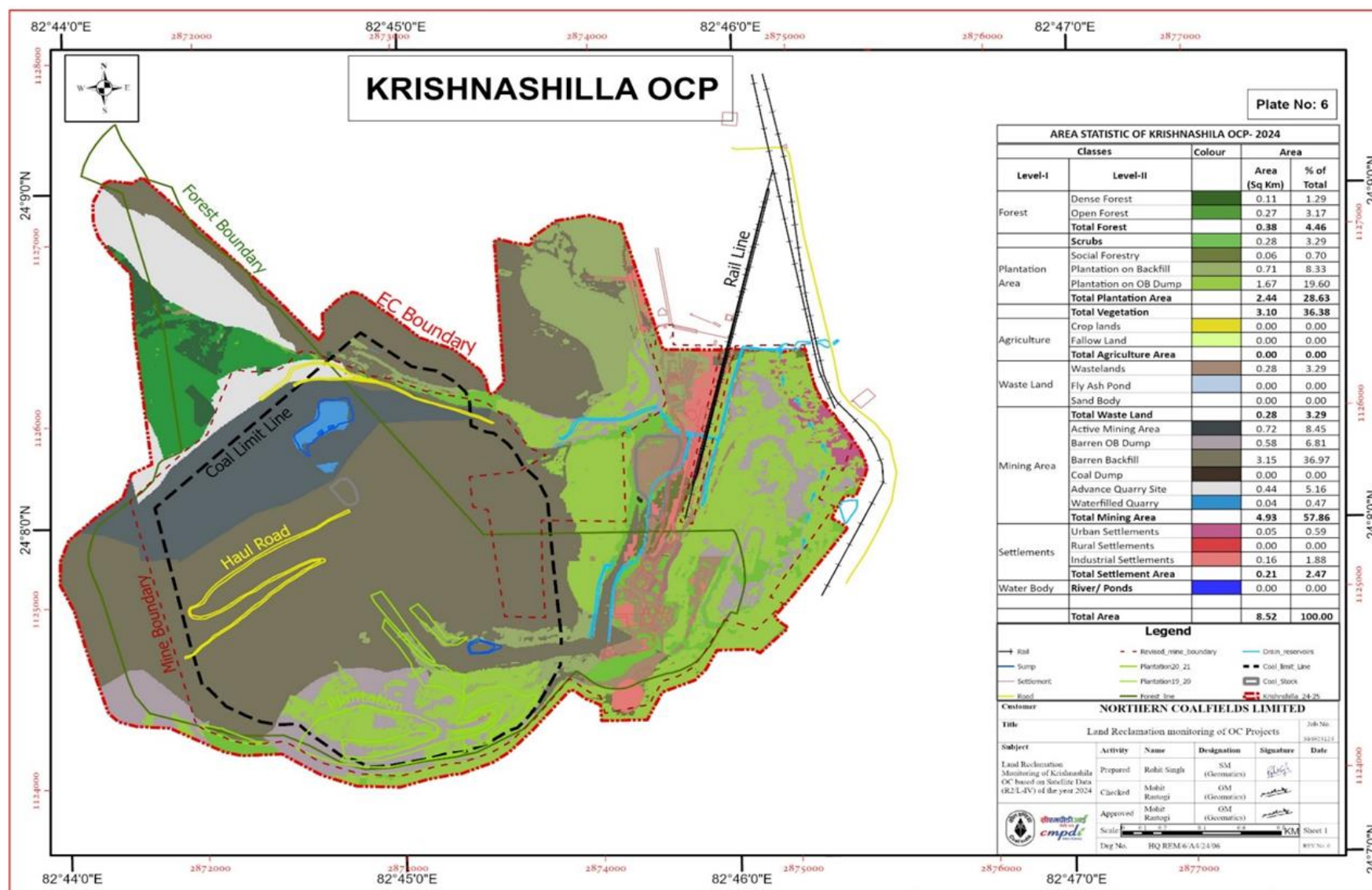


Plate 7-6: Land Use/Cover map of Krishnashilla OCP

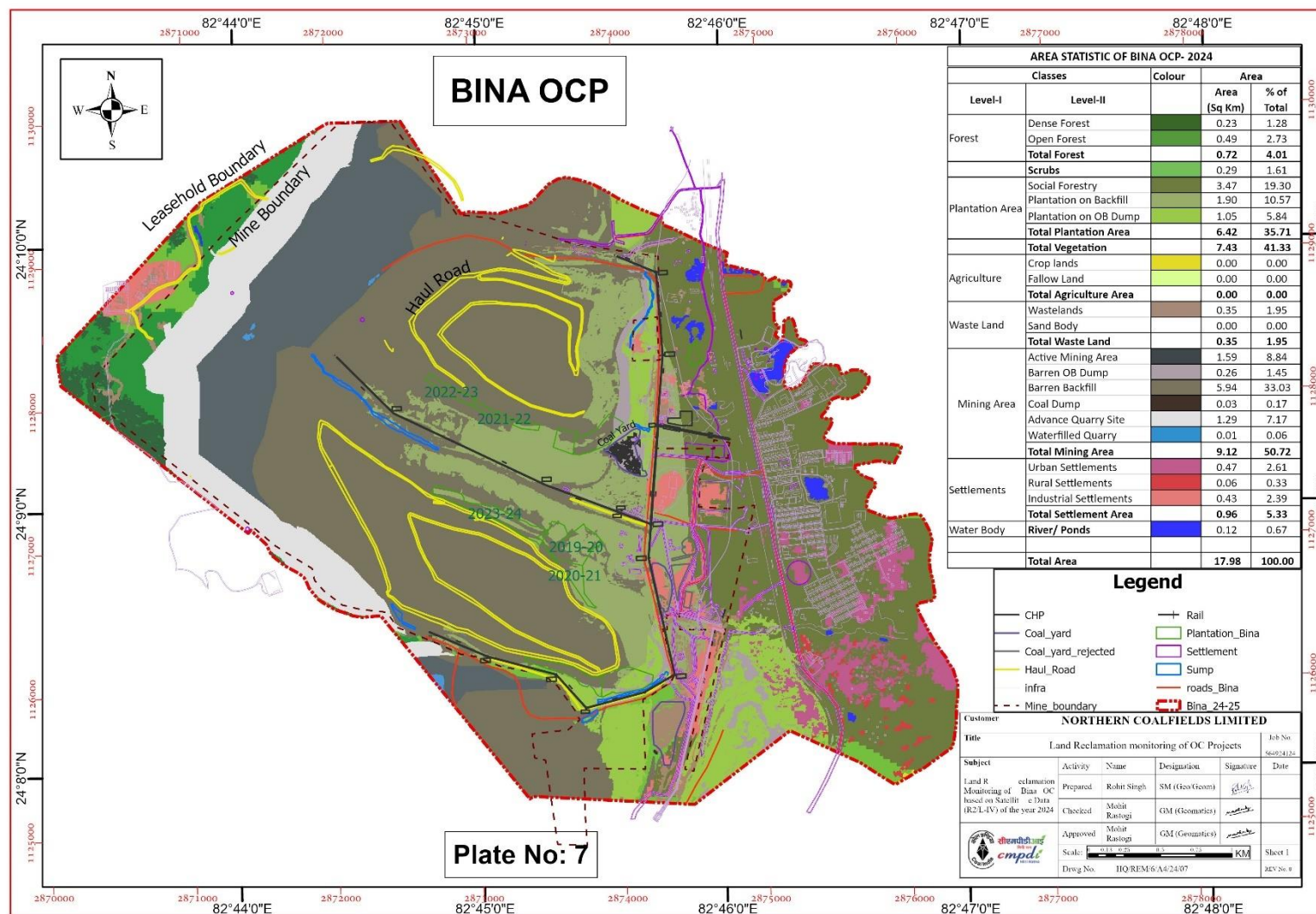


Plate 7-7: Land Use/Cover map of Bina OCP

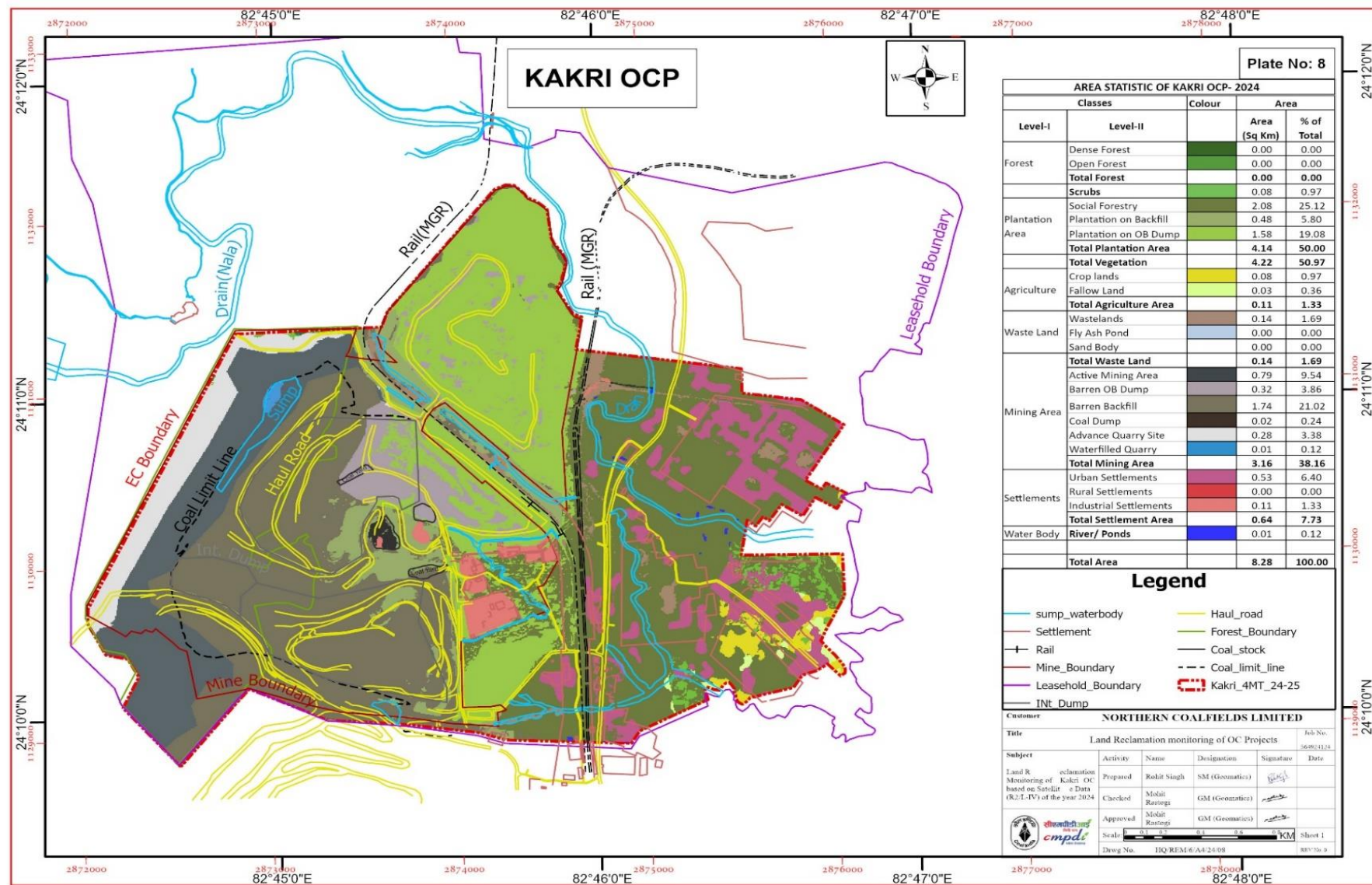


Plate 7-8: Land Use/Cover map of Kakri OCP

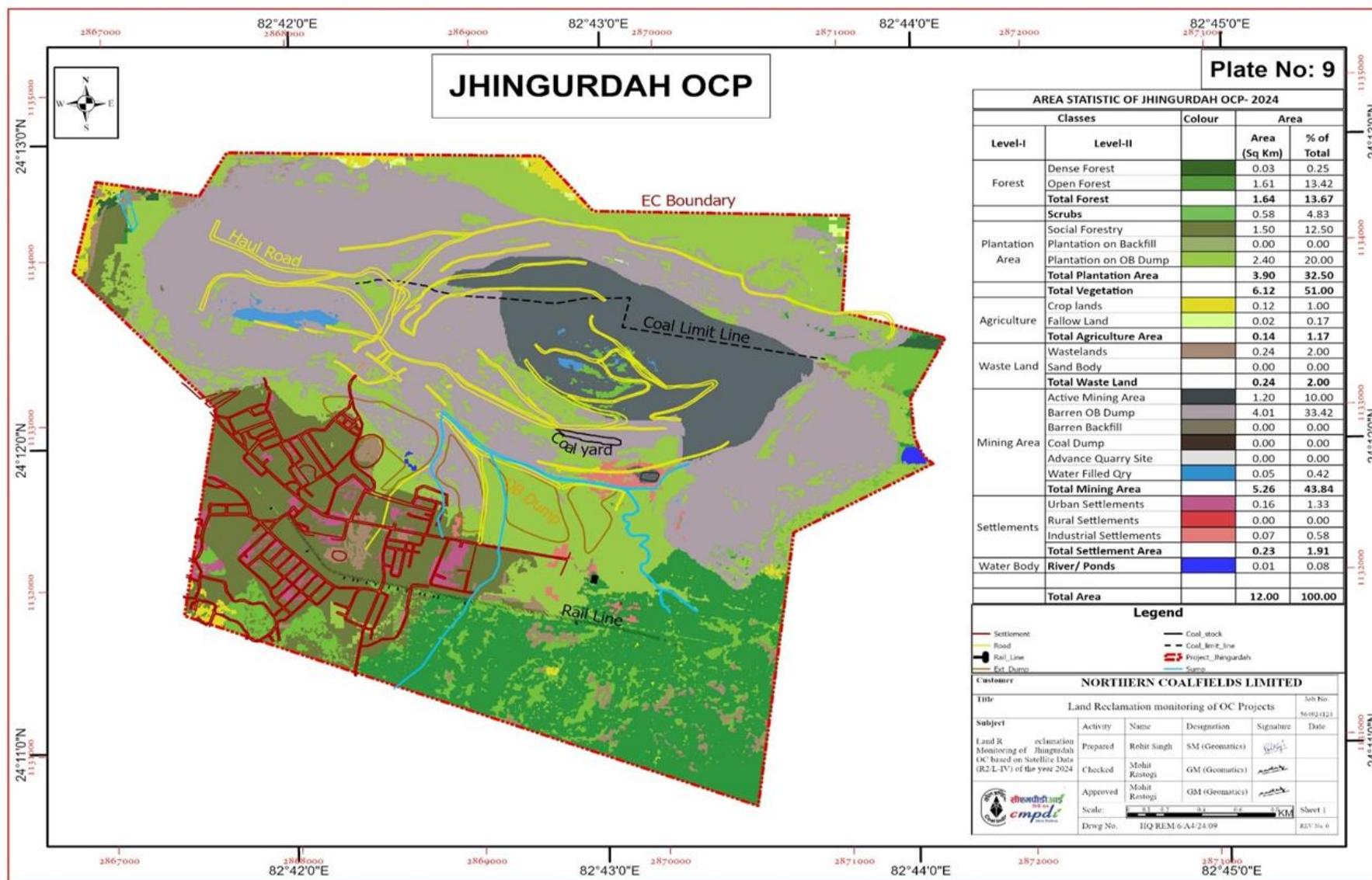


Plate 7-9: Land Use/Cover map of Jhingurdah. OCP

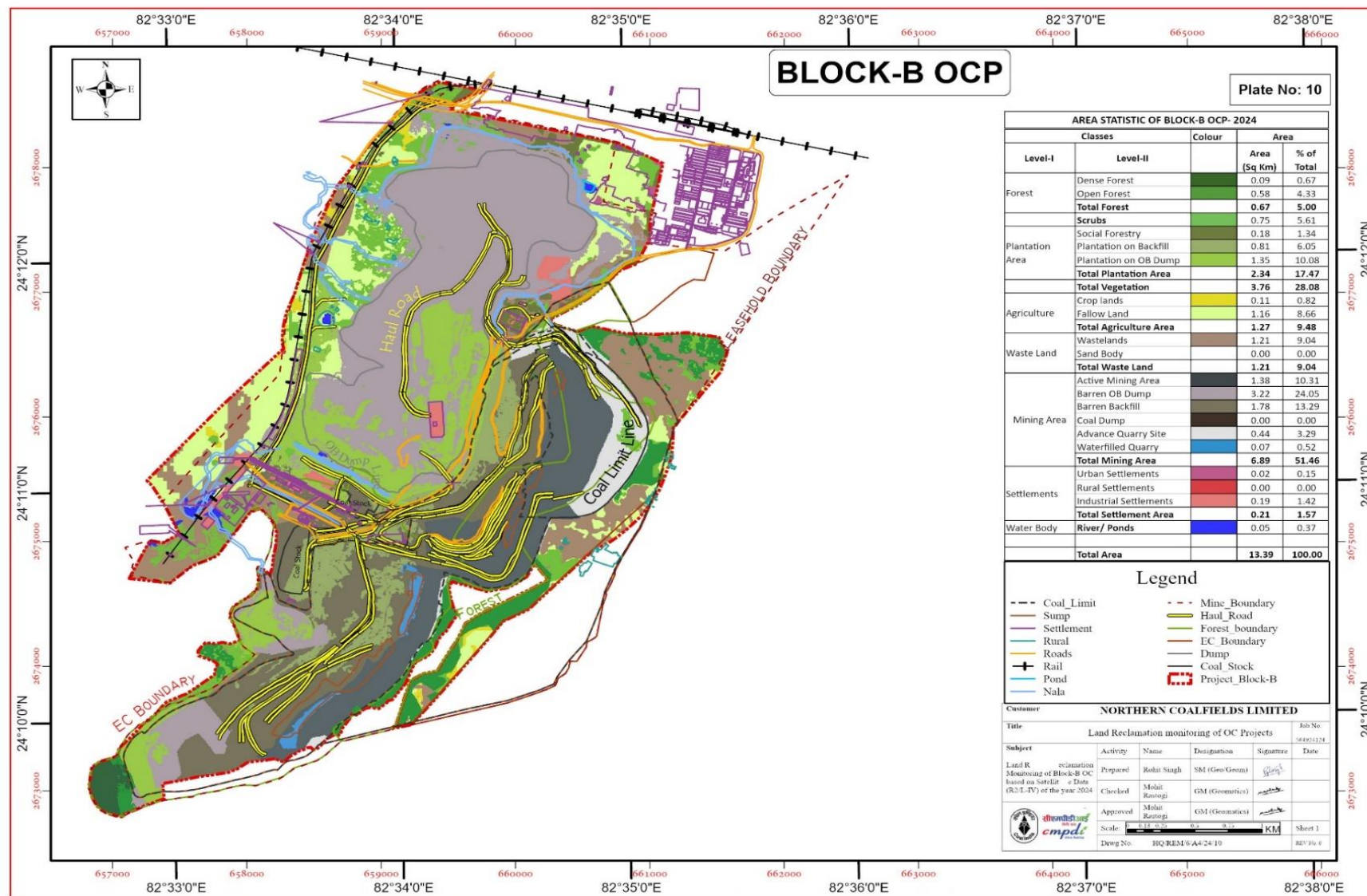


Plate 7-10: Land Use/Cover map of Block B OCP

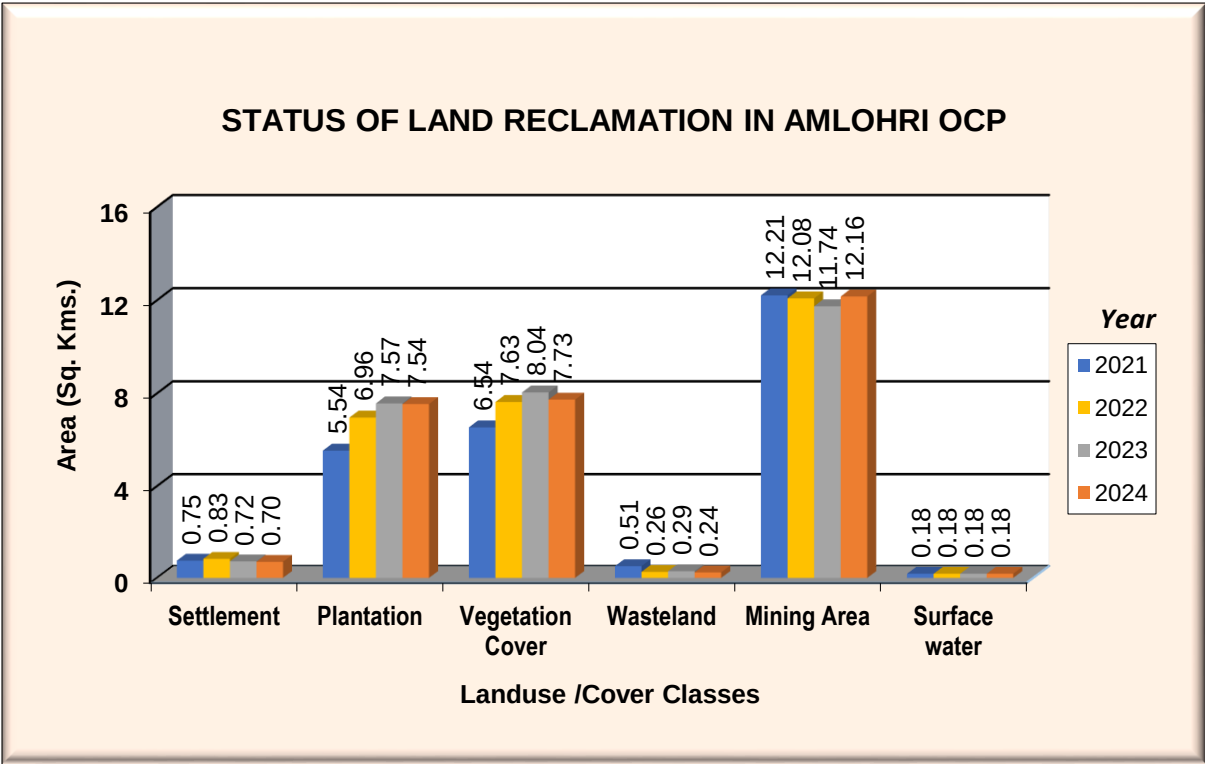


Chart 7.2: Status of Land Reclamation in Amlohri OCP

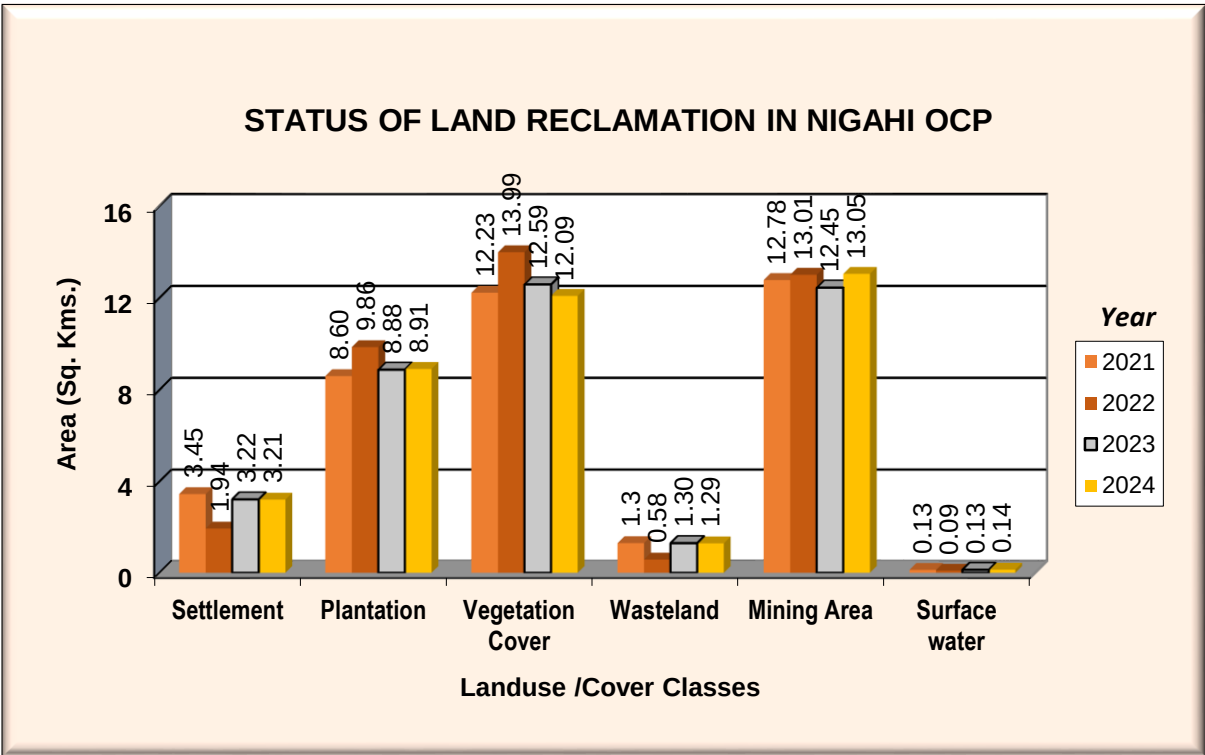


Chart 7.3: Status of Land Reclamation in Nigahi OCP

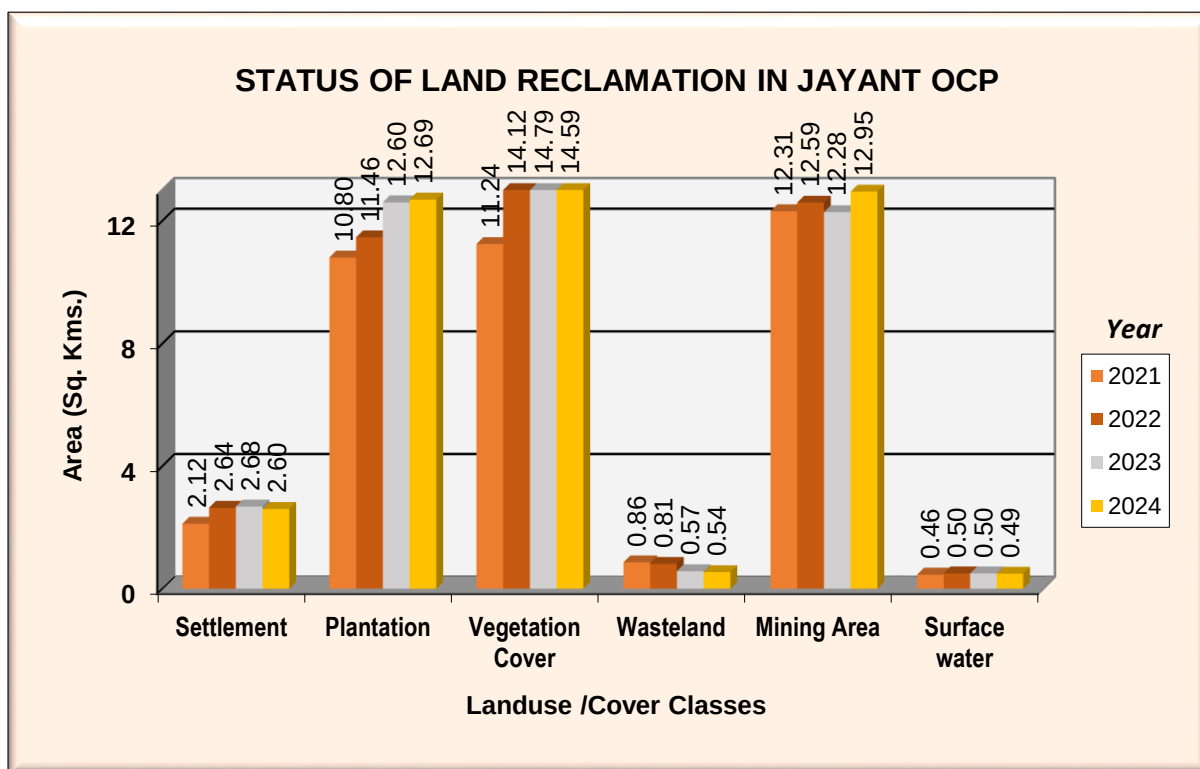


Chart 7.4: Status of Land Reclamation in Jayant OCP

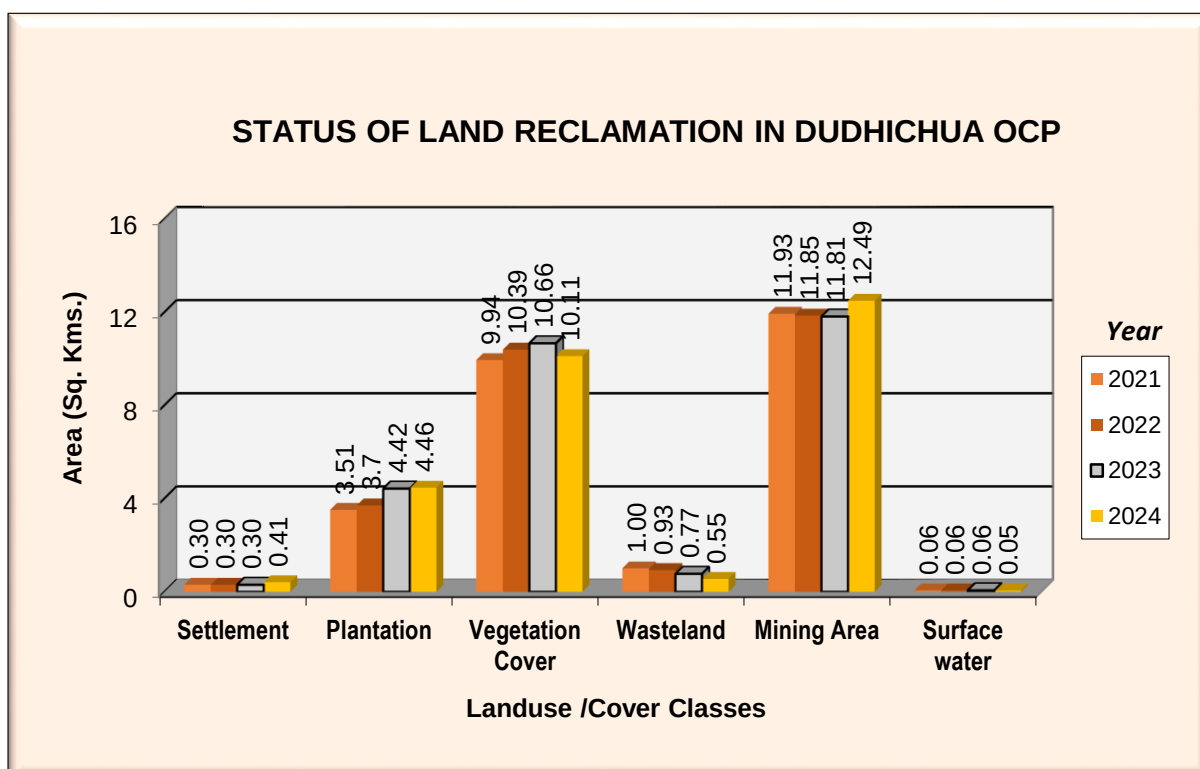


Chart 7.5: Status of Land Reclamation in Dudhichua OCP

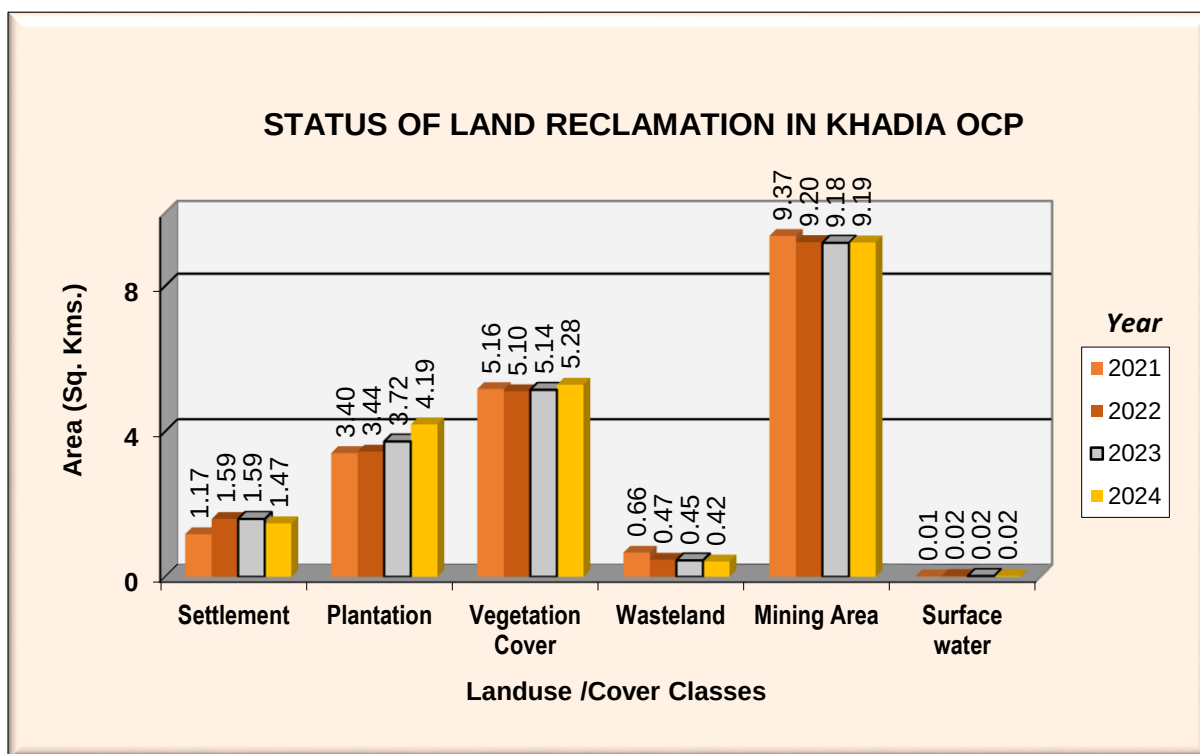


Chart 7.6: Status of Land Reclamation in Khadia OCP

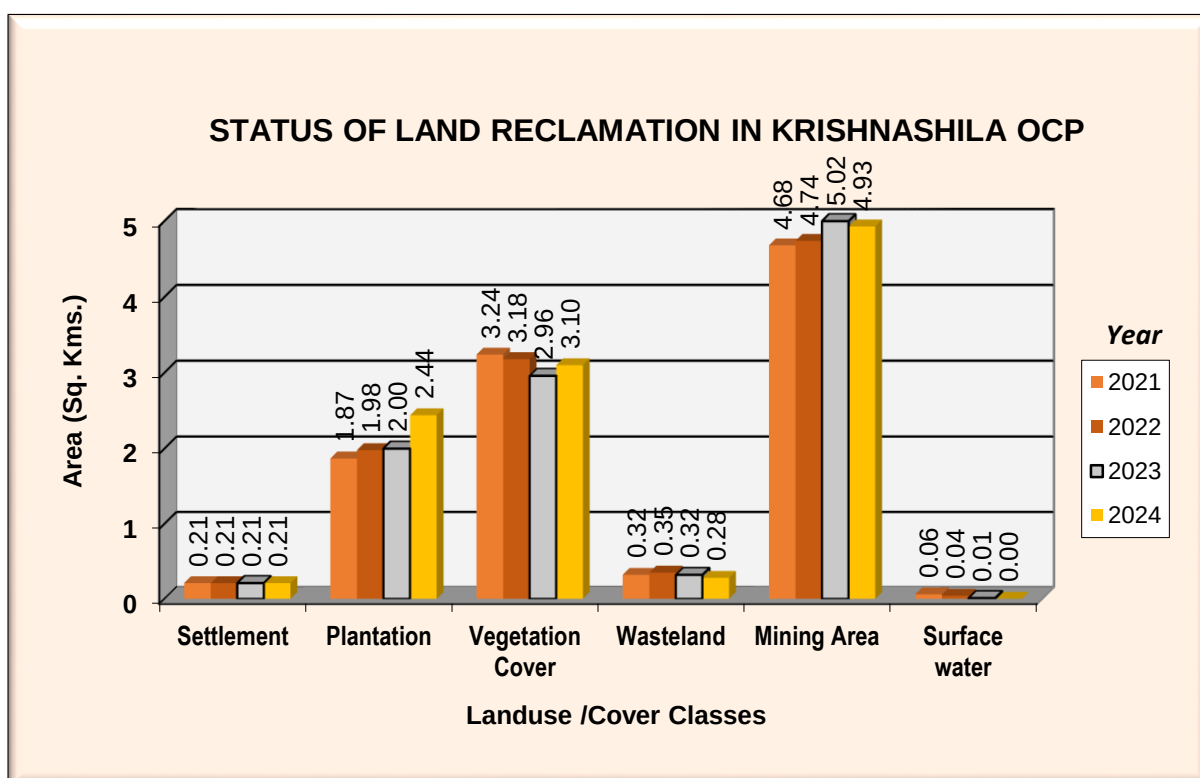


Chart 7.7: Status of Land Reclamation in Krishnashila OCP

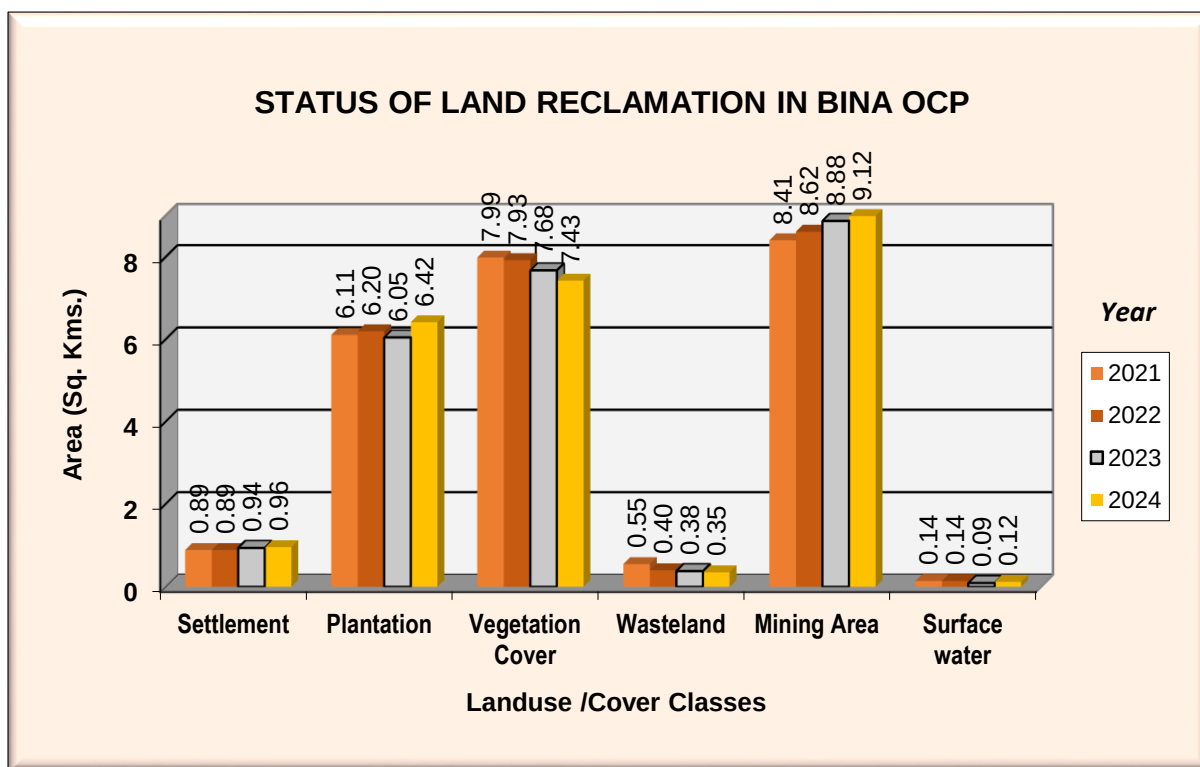


Chart 7.8: Status of Land Reclamation in Bina OCP

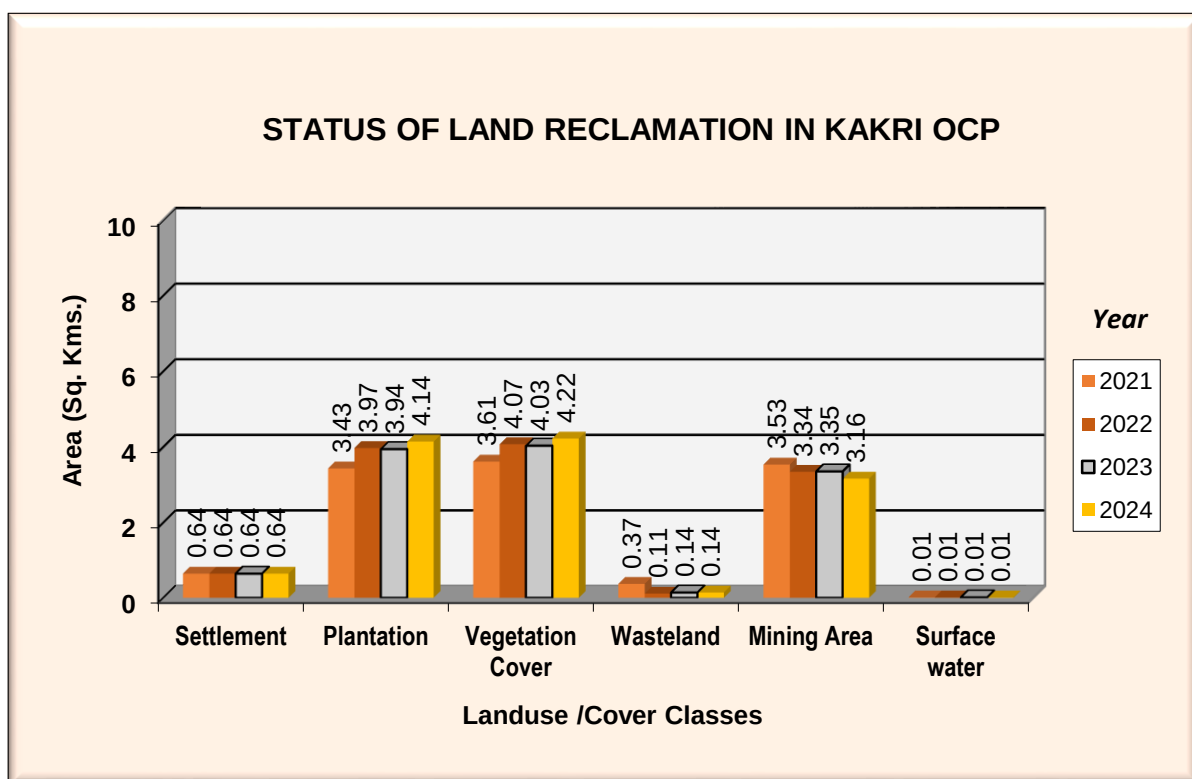


Chart 7.9: Status of Land Reclamation in Kakri OCP

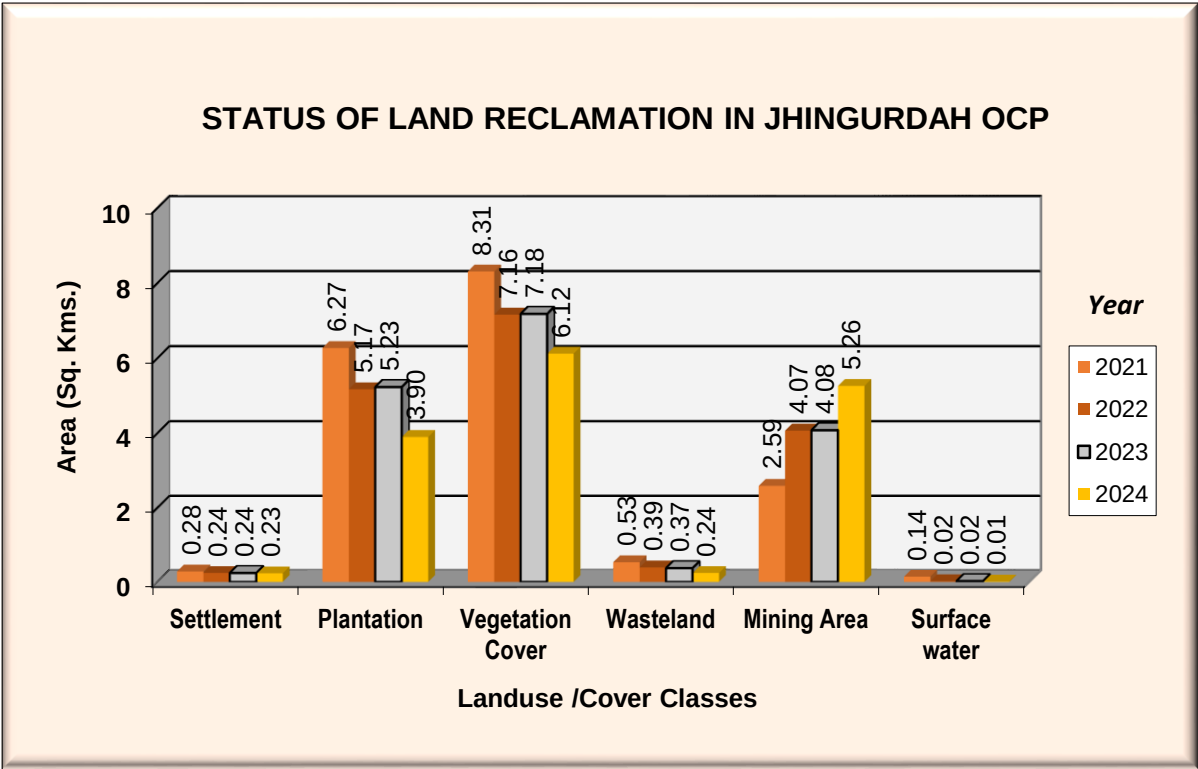


Chart 7.10: Status of Land Reclamation in Jhingurдах OCP

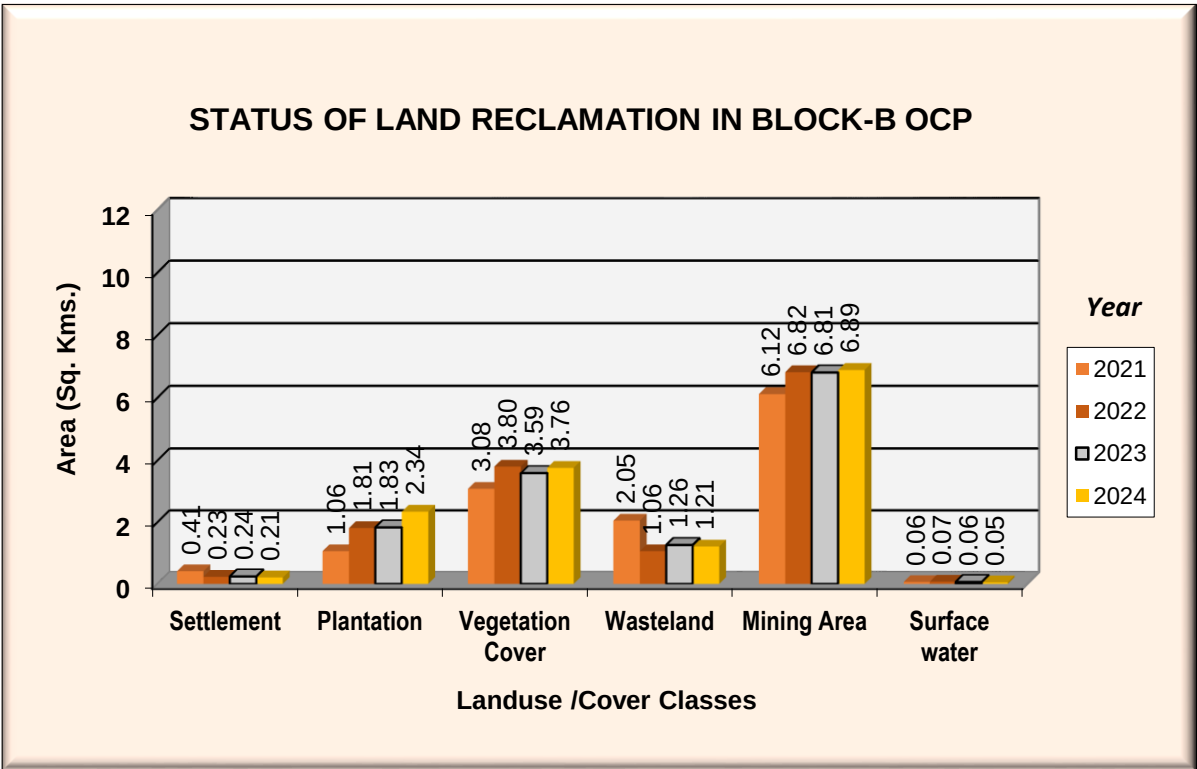


Chart 7.11: Status of Land Reclamation in Block B OCP



Photo 7.1: Amlohri OCP- Newly Plantation growing on Backfill Area



Photo 7.2: Nigahi OCP- Plantation growing on the Backfill benches



Photo 7.3: Plantation done on Jayant OCP



Photo 7.4: Plantation done on Dudhichua OCP



Photo 7.5: Plantation done on Khadia OCP



Photo 7.6: Plantation done on Krishnashila OCP



Photo 7.7: Plantation done on Bina OCP



Photo 7.8: Miyawaki Plantation done in Kakri colony



Photo 7.9: Jhingurdah OCP-Planted area on External Dump



Photo 7.10: Plantation done on Block-B OCP

MAHANADI COALFIELDS LIMITED

8. Land Reclamation Status in Mahanadi Coalfields Limited

8.1 Following Sixteen (13) opencast projects of MCL producing more than 5 million cubic meter and more (Coal + OB) were taken up for land reclamation monitoring based on satellite data of the year 2024.

- Ananta
- Balram
- Lingaraj
- Bharatpur
- Bhubaneswari
- Jagannath
- Hingula
- Kaniha
- Integrated Lakhanpur-Belpahar-Lilari
- Samleswari
- Lajkura
- Garjanbahal
- Kulda

8.2 Project wise Land Reclamation status in MCL for the year 2024 is given in Table 8.1 and also shown graphically in Fig 8.1(A) and 8.1(B). Area statistics of different land use / cover classes present in the mine leasehold of the above projects for the year 2024-25 are shown in the Table -8.2 (A & B). Land use maps derived from satellite data are shown in Plate 8.1 – 8.16. Year wise changes in the different land use classes based on satellite data are depicted in Bar Charts in Fig. 8.2–8.17 for the last three years only.

8.3 Study reveals that out of total 72.53 Km² excavated area; 43.28 Km² area (59.67%) is under reclamation. Out of which 8.22 Km² (11.33%) area has been re-vegetated and 35.06 Km² (48.34%) area is under backfilling.

8.4 Total Area under active mining has increased from 27.74 Km² (Yr. 2023) to 29.25 km² (Yr. 2024).

8.5 Analysis of satellite data indicates that plantation on backfill has reduced in some projects as Ananta, Bharatpur, Jagannath and Lajkura for fresh backfilling activities and for construction of roads and railway connectivity projects.

8.6 Plantation on External OB dump has marginally reduced in Hingula, Integrated LBL and Lajkura OCP due to construction of roads. Area of Social forestry has reduced marginally in some projects due to mine advancement and change in lease boundary.

8.7 Study also reveals that area under barren backfilling (Technical Reclamation) has increased from 33.25 Km² in 2023 to 35.06 Km² in 2024.

8.8 It was observed that Green Cover has reduced in some projects of MCL due to reduction in plantation and social forestry in the leasehold areas resulted from mining activities.

8.9 On comparing the status of land reclamation for the year 2024 with respect to the year 2023 in different projects, it is evident that area of land reclamation has increased from 41.44 Km² (Yr.2023) to 43.28 Km² (Yr.2024).

8.10 Out of 13 projects of MCL, Samleswari OC ranks on top for land reclamation (69.38%) followed by Balram OC (69.34%) and Jagannath OC (68.12%).

Table 8.1: Summarized Land Reclamation Status in MCL
Summarized Land Reclamation Status in Opencast Projects of MCL based on Satellite Data of the year 2024

Table 1: Project wise Land Reclamation Status in Opencast Projects of MCL based on Satellite Data of the year 2024																			(Area in Sq.km.)	
Sl. No.	Project	Total Leasehold Area 2023	Total Leasehold Area 2024	Technical Reclamation		Plantation						Area Under Active Mining	Total Excavated Area		Total Area Under Plantation (%Green Cover Generated in Leasehold)		Total Area Under Reclamation			
						Biological Reclamation		Other Plantation												
				Area under Backfilling		Plantation on Excavated/Backfilled Area		Plantation on External Over Burden Dump		Social Forestry, Avenue Plantation Etc.										
1	2	3	4	5		6		7		8		9		10(=5+6+9)		11(=6+7+8)		12(=5+6)		
				2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	
1	Ananta	14.20	14.20	3.18	3.56	0.97	0.92	0.08	0.08	0.21	0.19	2.12	2.21	6.27	6.69	1.26	1.19	4.15	4.48	
				50.72%	53.21%	15.47%	13.75%					33.81%	33.03%			8.87%	8.38%	66.19%	66.97%	
2	Balram	13.09	13.09	3.05	3.10	0.94	0.97	0.22	0.22	0.32	0.33	1.68	1.80	5.67	5.87	1.48	1.52	3.99	4.07	
				53.79%	52.81%	16.58%	16.52%					29.63%	30.66%			11.31%	11.61%	70.37%	69.34%	
3	Lingaraj	14.10	14.10	2.52	2.56	0.16	0.18	0.56	0.62	0.45	0.46	3.04	3.14	5.72	5.88	1.17	1.26	2.68	2.74	
				44.06%	43.54%	2.80%	3.06%					53.15%	53.40%			8.30%	8.94%	46.85%	46.60%	
4	Bharatpur	9.27	9.27	2.84	2.86	1.63	1.54	0.45	0.45	0.15	0.16	2.00	2.26	6.47	6.66	2.23	2.15	4.47	4.40	
				43.89%	42.94%	25.19%	23.12%					30.91%	33.93%			24.06%	23.19%	69.09%	66.07%	
5	Bhubaneswari	6.58	6.58	2.45	2.40	0.06	0.08	0.01	0.01	0.06	0.05	2.11	1.97	4.62	4.45	0.13	0.14	2.51	2.48	
				53.03%	53.93%	1.30%	1.80%					45.67%	44.27%			1.98%	2.13%	54.33%	55.73%	
6	Jagannath	5.54	5.54	1.11	1.23	1.78	1.74	0.00	0.00	0.11	0.11	1.31	1.39	4.20	4.36	1.89	1.85	2.89	2.97	
				26.43%	28.21%	42.38%	39.91%					31.19%	31.88%			34.12%	33.39%	68.81%	68.12%	
7	Hingula	15.75	15.75	1.85	2.01	0.05	0.09	0.17	0.12	0.29	0.29	2.50	2.49	4.40	4.59	0.51	0.50	1.90	2.10	
				42.05%	43.79%	1.14%	1.96%					56.82%	54.25%			3.24%	3.17%	43.18%	45.75%	
8	Kaniha	7.18	7.18	0.49	0.61	0.00	0.00	0.00	0.00	0.09	0.08	1.57	1.58	2.06	2.19	0.09	0.08	0.49	0.61	
				23.79%	27.85%	0.00%	0.00%					76.21%	72.15%			1.25%	1.11%	23.79%	27.85%	
9	Integrated Lakhampur-Belpahar-Liari	38.85	43.99	9.42	9.70	1.85	1.90	1.17	1.14	0.88	0.78	5.94	6.54	17.21	18.14	3.90	3.82	11.27	11.60	
				54.74%	53.47%	10.75%	10.47%					34.51%	36.05%			10.04%	8.68%	65.49%	63.95%	
10	Samleswari	13.35	13.35	3.22	3.38	0.61	0.63	0.49	0.49	0.47	0.48	1.64	1.77	5.47	5.78	1.57	1.60	3.83	4.01	
				58.87%	58.48%	11.15%	10.90%					29.98%	30.62%			11.76%	11.99%	70.02%	69.38%	
11	Lajkura	7.21	7.21	1.52	1.54	0.13	0.11	0.12	0.10	0.16	0.16	1.14	1.39	2.79	3.04	0.41	0.37	1.65	1.65	
				54.48%	50.66%	4.66%	3.62%					40.86%	45.72%			5.69%	5.13%	59.14%	54.28%	
12	Garjanbahal	6.54	6.54	0.43	0.79	0.00	0.00	0.00	0.00	0.02	0.03	0.98	0.99	1.41	1.78	0.02	0.03	0.43	0.79	
				30.50%	44.38%	0.00%	0.00%					69.50%	55.62%			0.31%	0.46%	30.50%	44.38%	
13	Kulda	6.34	6.34	1.17	1.32	0.01	0.06	0.01	0.01	0.03	0.03	1.71	1.72	2.89	3.10	0.05	0.10	1.18	1.38	
				40.48%	42.58%	0.35%	1.94%					59.17%	55.48%			0.79%	1.58%	40.83%	44.52%	
	Total	158.00	163.14	33.25	35.06	8.19	8.22	3.28	3.24	3.24	3.15	27.74	29.25	69.18	72.53	14.71	14.61	41.44	43.28	
				48.06%	48.34%	11.84%	11.33%					40.10%	40.33%			9.31%	8.96%	59.90%	59.67%	

Note: In reference to the above Table-1, different parameters are classified as follows:

1. Area under **Biological Reclamation** includes Area under Plantation done on Backfilled Area only.
2. Area under **Technical Reclamation** includes Area under Barren Backfilling only.
3. Area under **Active Mining** includes Coal Quarry, Advance Quarry Site, Quarry Filled with Water, if any. Areas under coal dump have been excluded from Active Mining in this table.
4. Social Forestry and Plantation on External OB Dumps are not included in Biological Reclamation and are put under separate categories as shown in the Table above.
5. (%) calculated in the above Table is in respect to Total Excavated Area except for "Total Area under Plantation" where % is in terms of "Leasehold Area"

LAND RECLAMATION STATUS OF PROJECTS IN TALCHER CF, MCL (YEAR-2024)-I

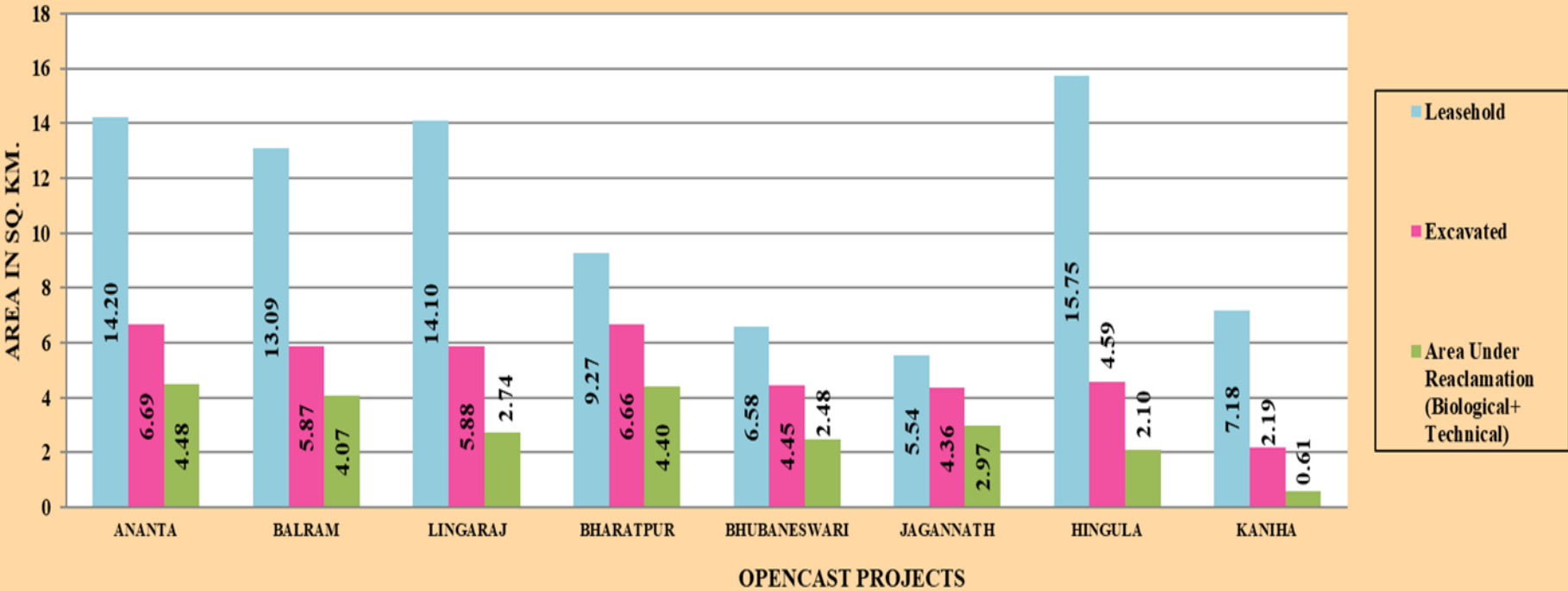


Chart 8.1: Bar Chart showing Land Reclamation Status in MCL (part-1)

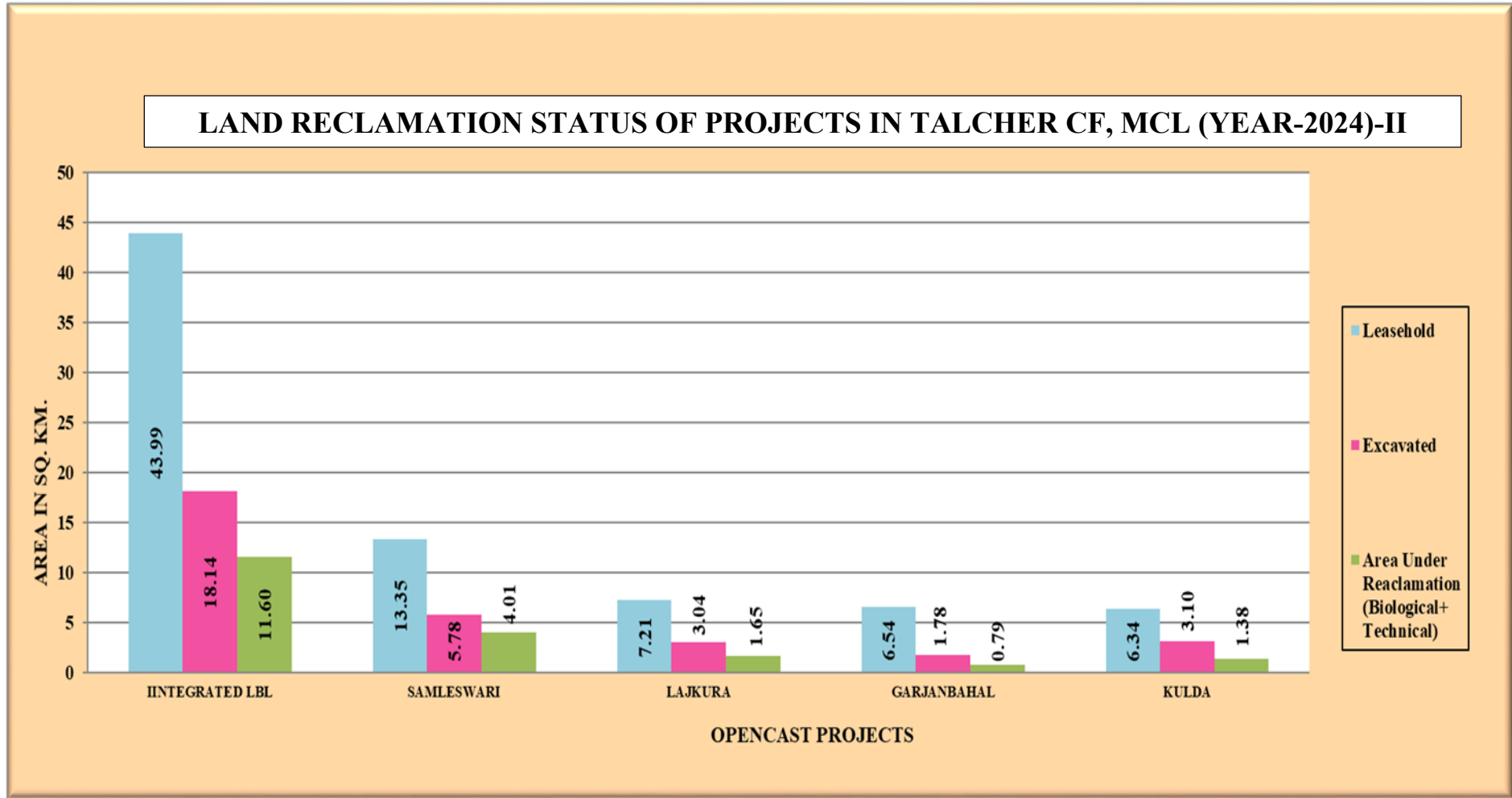


Chart 8.2: Bar Chart showing Land Reclamation Status in MCL (part-2)

Table 8.2: Project-wise Land Reclamation Status in Opencast Projects of MCL (2024)
Part-A

		(Area in Sq. Kms.)																	
		ANANTA		BALRAM		LINGARAJ		BHARATPUR		BHUBANESHWARI		JAGANNATH		HINGULA		KANIHA		TOTAL	
		Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
FORESTS	Dense Forest	1.02	7.18	0.00	0.00	0.00	0.00	0.02	0.22	0.00	0.00	0.00	0.00	1.00	6.35	0.00	0.00	2.04	2.38
	Open Forest	1.03	7.25	0.58	4.43	0.39	2.77	0.00	0.00	0.18	2.74	0.02	0.36	1.51	9.59	0.00	0.00	3.71	4.33
	Total Forest (A)	2.05	14.44	0.58	4.43	0.39	2.77	0.02	0.22	0.18	2.74	0.02	0.36	2.51	15.94	0.00	0.00	5.75	6.71
SCRUBS	Scrubs (B)	1.45	10.21	1.60	12.22	1.69	11.99	0.36	3.88	0.29	4.41	0.21	3.79	2.65	16.83	0.56	10.17	8.81	10.28
	Social Forestry	0.19	1.34	0.33	2.52	0.46	3.26	0.16	1.73	0.05	0.76	0.11	1.99	0.29	1.84	0.08	0.97	1.67	1.95
	Plantation on External OB Dump	0.08	0.56	0.22	1.68	0.62	4.40	0.45	4.85	0.01	0.08	0.00	0.00	0.12	0.76	0.00	0.00	1.50	1.74
PLANTATION	Plantation on Backfill Excavated Area (Biological Reclamation)	0.92	6.48	0.97	7.41	0.18	1.28	1.54	16.61	0.08	1.22	1.74	31.41	0.09	0.57	0.00	0.00	5.52	6.44
	Total Plantation (Green Cover) (C)	1.19	8.38	1.52	11.61	1.26	8.94	2.15	23.19	0.14	2.05	1.85	33.39	0.50	3.17	0.08	0.97	8.69	10.13
	Total Vegetation (A+B+C)	4.69	33.03	3.70	28.27	3.34	23.69	2.53	27.29	0.61	9.20	2.08	37.55	5.66	35.94	0.64	11.14	23.25	27.12
ACTIVE MINING	Coal Dump	0.20	1.41	0.26	1.99	0.33	2.34	0.19	2.05	0.31	4.71	0.09	1.62	0.40	2.54	0.18	1.67	1.96	2.29
	Coal Quarry	2.10	14.79	1.03	7.87	2.74	19.43	1.25	13.48	1.62	24.64	0.68	12.27	1.50	9.52	1.45	16.29	12.37	14.43
	Advance Quarry Site	0.03	0.21	0.20	1.53	0.23	1.63	0.14	1.51	0.09	1.37	0.10	1.81	0.15	0.95	0.08	0.14	1.02	1.19
	Quarry Filled with Water	0.08	0.56	0.57	4.35	0.17	1.21	0.87	9.39	0.26	3.95	0.61	11.01	0.84	5.33	0.05	0.84	3.45	4.03
	Total Area under Active Mining	2.21	15.56	1.80	13.75	3.14	22.27	2.26	24.38	1.97	29.96	1.39	25.09	2.49	15.81	1.58	17.27	16.84	19.64
	Barren OB dump	0.01	0.07	0.13	0.99	0.69	4.89	0.06	0.65	0.80	12.17	0.00	0.00	0.95	6.03	0.65	5.85	3.29	3.84
	Area Under Backfilling (Technical Reclamation)	3.56	25.07	3.10	23.68	2.56	18.16	2.86	30.85	2.40	36.50	1.23	22.20	2.01	12.76	0.61	4.32	18.33	21.39
	Total Area under Mine Operation	5.98	42.11	5.29	40.41	6.72	47.66	5.37	57.93	5.48	83.35	2.71	48.92	5.85	37.14	3.02	29.11	40.42	44.87
WASTELANDS	Waste Lands	1.42	10.00	1.15	8.79	2.02	14.33	0.44	4.75	0.14	2.13	0.30	5.42	1.57	9.97	0.94	13.93	7.98	9.31
	Fly Ash Pond/Sand Body	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	1.99	0.06	0.38	0.00	0.00	0.17	0.20
	Total Wastelands	1.42	10.00	1.15	8.79	2.02	14.33	0.44	4.75	0.14	2.13	0.41	7.40	1.63	10.35	0.94	13.93	8.15	9.51
WATER	Reservoir, nallah, ponds etc.	0.20	1.41	0.25	1.91	0.06	0.43	0.02	0.22	0.01	0.15	0.03	0.54	0.33	2.10	0.07	0.97	0.97	1.13
	Total Waterbodies	0.20	1.41	0.25	1.91	0.06	0.43	0.02	0.22	0.01	0.15	0.03	0.54	0.33	2.10	0.07	0.97	0.97	1.13
AGRICULTURE	Crop Lands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	2.79	0.15	0.17
	Fallow Lands	1.45	10.21	1.99	15.20	0.94	6.67	0.55	5.93	0.20	3.04	0.17	3.07	2.05	13.02	2.04	37.74	9.39	10.96
	Total Agriculture	1.45	10.21	1.99	15.20	0.94	6.67	0.55	5.93	0.20	3.04	0.17	3.07	2.05	13.02	2.19	40.53	9.54	11.13
SETTLEMENTS	Urban Settlement	0.00	0.00	0.00	0.00	0.45	3.19	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.00	0.00	0.46	0.54
	Rural Settlement	0.14	0.99	0.25	1.91	0.14	0.99	0.05	0.54	0.02	0.30	0.03	0.54	0.19	1.21	0.24	3.48	1.06	1.24
	Industrial Settlement	0.32	2.25	0.46	3.51	0.43	3.05	0.31	3.34	0.12	1.83	0.11	1.99	0.03	0.19	0.09	0.84	1.87	2.18
	Total Settlements	0.46	3.24	0.71	5.42	1.02	7.23	0.36	3.88	0.14	2.13	0.14	2.53	0.23	1.46	0.33	4.32	3.39	3.96
GRAND TOTAL		14.20	100.00	13.09	100.00	14.10	100.00	9.27	100.00	6.58	100.00	5.54	100.00	15.75	100.00	7.18	100.00	85.71	100.00

Part-B

(Area in Sq. Kms.)															
		INTEGRATED LBL		SAMLESWARI		LAJKURA		GARJANBAHAL		KULDA		TOTAL		ALL TOTAL	
		Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
FORESTS	Dense Forest	2.11	4.80	0.16	1.20	0.38	5.27	0.14	2.14	0.00	0.00	2.79	3.60	4.83	2.96
	Open Forest	5.55	12.62	0.51	3.82	0.47	6.52	0.56	8.56	0.04	0.63	7.13	9.21	10.84	6.64
	Total Forest (A)	7.66	17.42	0.67	5.02	0.85	11.79	0.70	10.70	0.04	0.63	2.22	12.81	7.97	4.89
SCRUBS	Scrubs (B)	5.74	13.05	2.25	16.85	0.80	11.10	0.83	12.69	0.96	15.14	10.58	13.66	19.39	11.89
PLANTATION	Social Forestry	0.78	1.77	0.48	3.59	0.16	2.22	0.03	0.46	0.03	0.47	1.48	1.91	3.15	1.93
	Plantation on External OB Dump	1.14	2.59	0.49	3.67	0.10	1.39	0.00	0.00	0.01	0.16	1.74	2.25	3.24	1.98
	Plantation on Backfill/Excavated Area(Biological Reclamation)	1.90	4.32	0.63	4.72	0.11	1.53	0.00	0.00	0.06	0.95	2.70	3.49	8.22	5.04
	Total Plantation (Green Cover) (C)	3.82	8.68	1.60	11.98	0.37	5.13	0.03	0.46	0.10	1.58	5.92	7.65	14.61	8.95
	Total Vegetation (A+B+C)	17.22	39.15	4.52	33.85	2.02	28.02	1.56	23.85	1.10	17.35	26.42	34.12	49.67	30.44
ACTIVE MINING	Coal Dump	0.47	1.07	0.11	0.82	0.05	0.69	0.28	4.28	0.09	1.42	1.00	1.29	2.96	1.81
	Coal Quarry	5.07	11.53	1.52	11.38	1.17	16.23	0.74	11.31	1.52	23.97	10.02	12.94	22.39	13.72
	Advance Quarry Site	0.79	1.80	0.17	1.27	0.21	2.91	0.24	3.67	0.08	1.26	1.49	1.92	2.51	1.54
	Quarry Filled with Water	0.68	1.55	0.08	0.60	0.01	0.14	0.01	0.15	0.12	1.89	0.90	1.16	4.35	2.67
	Total Area under Active Mining	6.54	14.87	1.77	13.26	1.39	19.28	0.99	15.14	1.72	27.13	12.41	16.03	29.25	17.93
	Barren OB dump	0.40	0.91	0.14	1.05	0.52	7.21	0.44	6.73	0.62	9.78	2.12	2.74	5.41	3.32
	Area Under Backfilling(Technical Reclamation)	9.70	22.05	3.38	25.31	1.54	21.36	0.79	12.08	1.32	20.82	16.73	21.61	35.06	21.49
	Total Area under Mine Operation	17.11	38.90	5.40	40.44	3.50	48.54	2.50	38.23	3.75	59.15	32.26	40.37	72.68	44.55
WASTELANDS	Waste Lands	4.34	9.87	1.73	12.96	0.87	12.07	0.40	6.12	0.60	9.46	7.94	10.25	15.92	9.76
	Fly Ash Pond/Sand Body	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.10
	Total Wastelands	4.34	9.87	1.73	12.96	0.87	12.07	0.40	6.12	0.60	9.46	7.94	10.25	16.09	9.86
WATER	Reservoir, nallah, ponds etc.	0.53	1.20	0.25	1.87	0.06	0.83	0.03	0.46	0.13	2.05	1.00	1.29	1.97	1.21
	Total Waterbodies	0.53	1.20	0.25	1.87	0.06	0.83	0.03	0.46	0.13	2.05	1.00	1.29	1.97	1.21
AGRICULTURE	Crop Lands	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	2.37	0.15	0.19	0.30	0.18
	Fallow Lands	3.83	8.71	1.02	7.64	0.45	6.24	1.84	28.13	0.56	8.83	7.70	9.94	17.09	10.48
	Total Agriculture	3.83	8.71	1.02	7.64	0.45	6.24	1.84	28.13	0.71	11.20	7.85	10.14	17.39	10.66
SETTLEMENTS	Urban Settlement	0.01	0.02	0.003	0.02	0.08	1.11	0.00	0.00	0.00	0.00	0.09	0.12	0.55	0.34
	Rural Settlement	0.26	0.59	0.19	1.42	0.02	0.28	0.07	1.07	0.01	0.16	0.55	0.71	1.61	0.99
	Industrial Settlement	0.69	1.57	0.24	1.80	0.21	2.91	0.14	2.14	0.04	0.63	1.32	1.70	3.19	1.96
	Total Settlements	0.96	2.18	0.433	3.24	0.31	4.30	0.21	3.21	0.05	0.79	1.96	2.53	5.35	3.28
	GRAND TOTAL	43.99	100.00	13.35	100.00	7.21	100.00	6.54	100.00	6.34	100.00	77.43	100.00	163.14	100.00

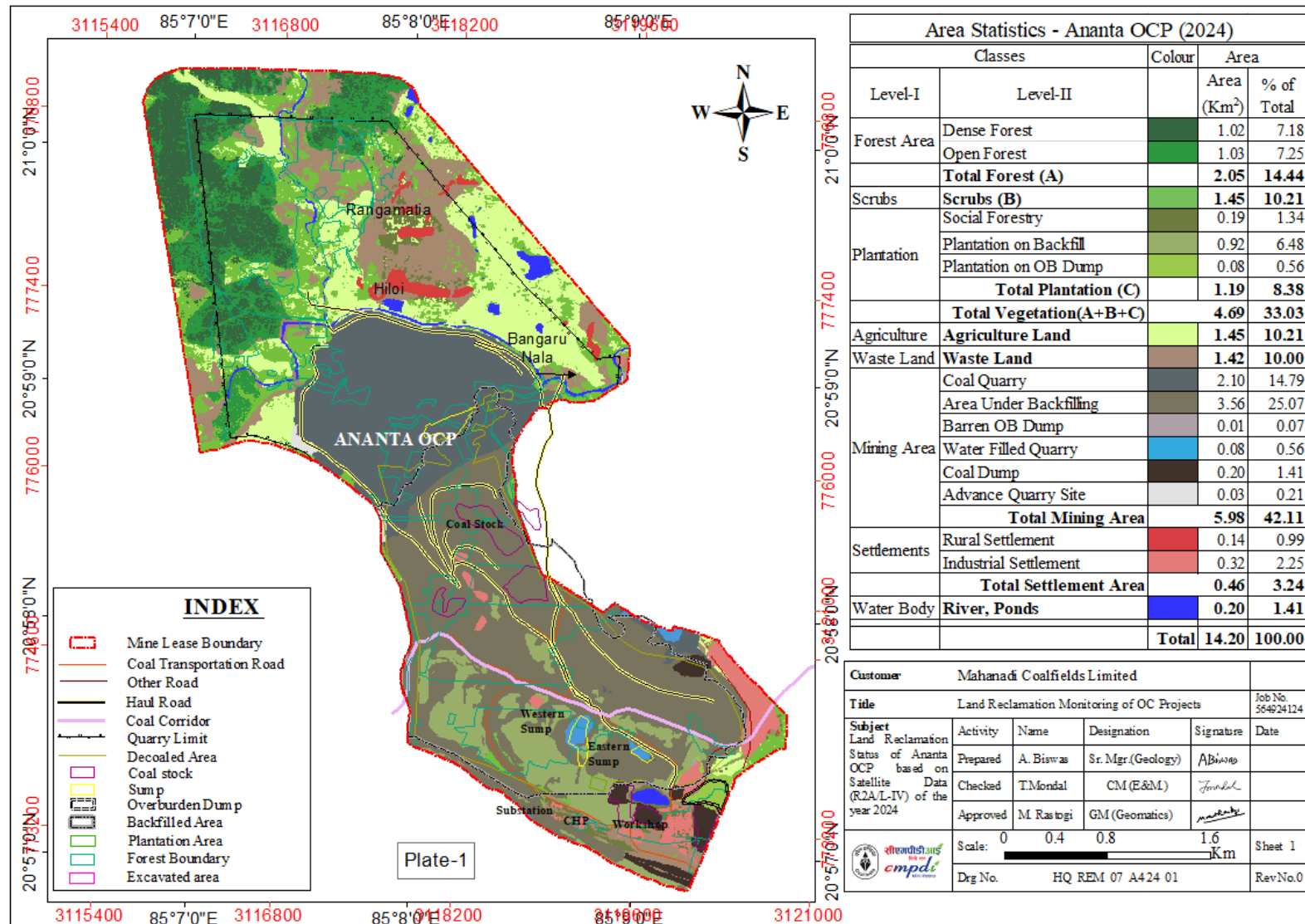


Plate 8-1: Land Use/Cover map of Ananta OCP

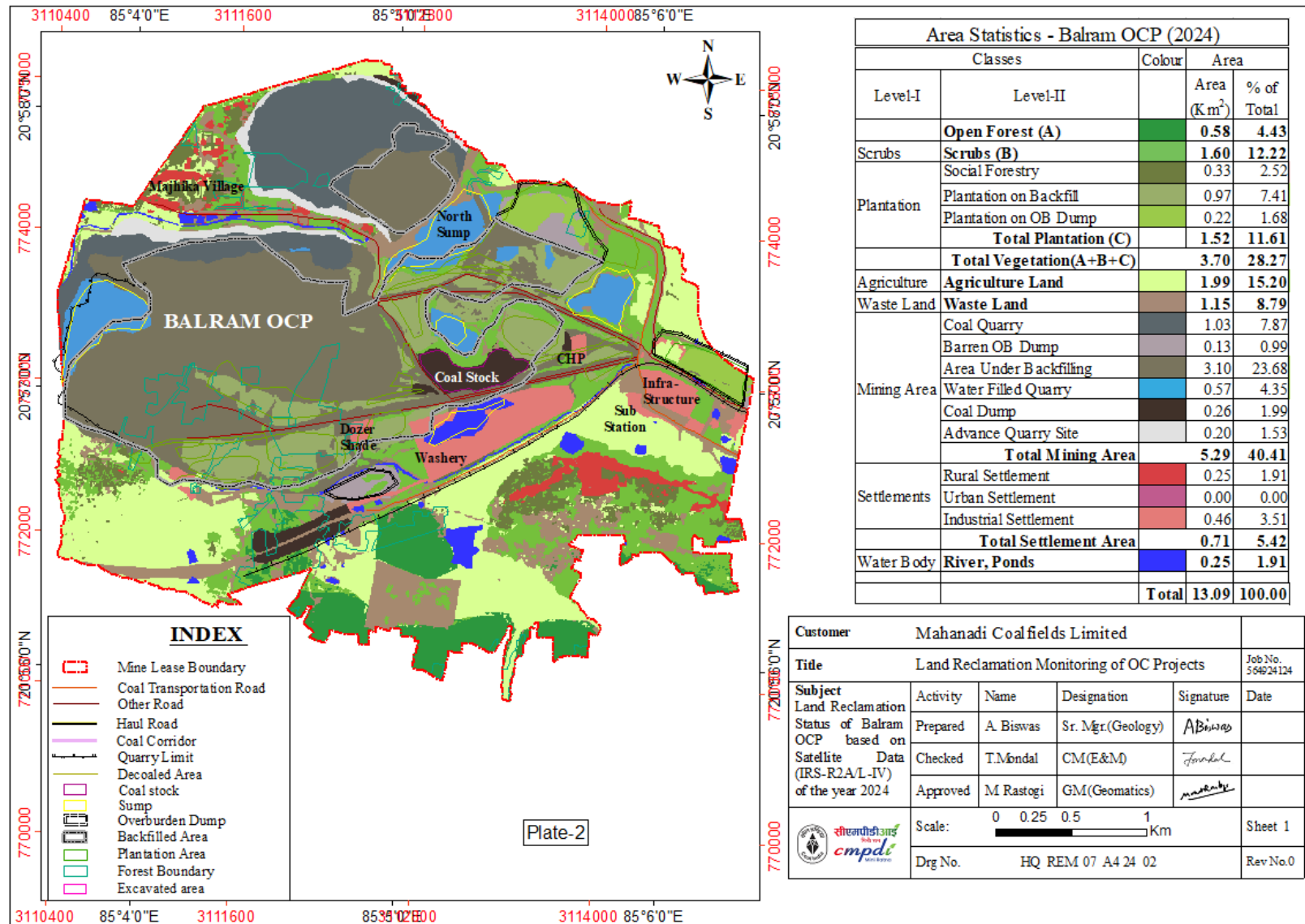


Plate 8-2: Land Use/Cover map of Balram OCP

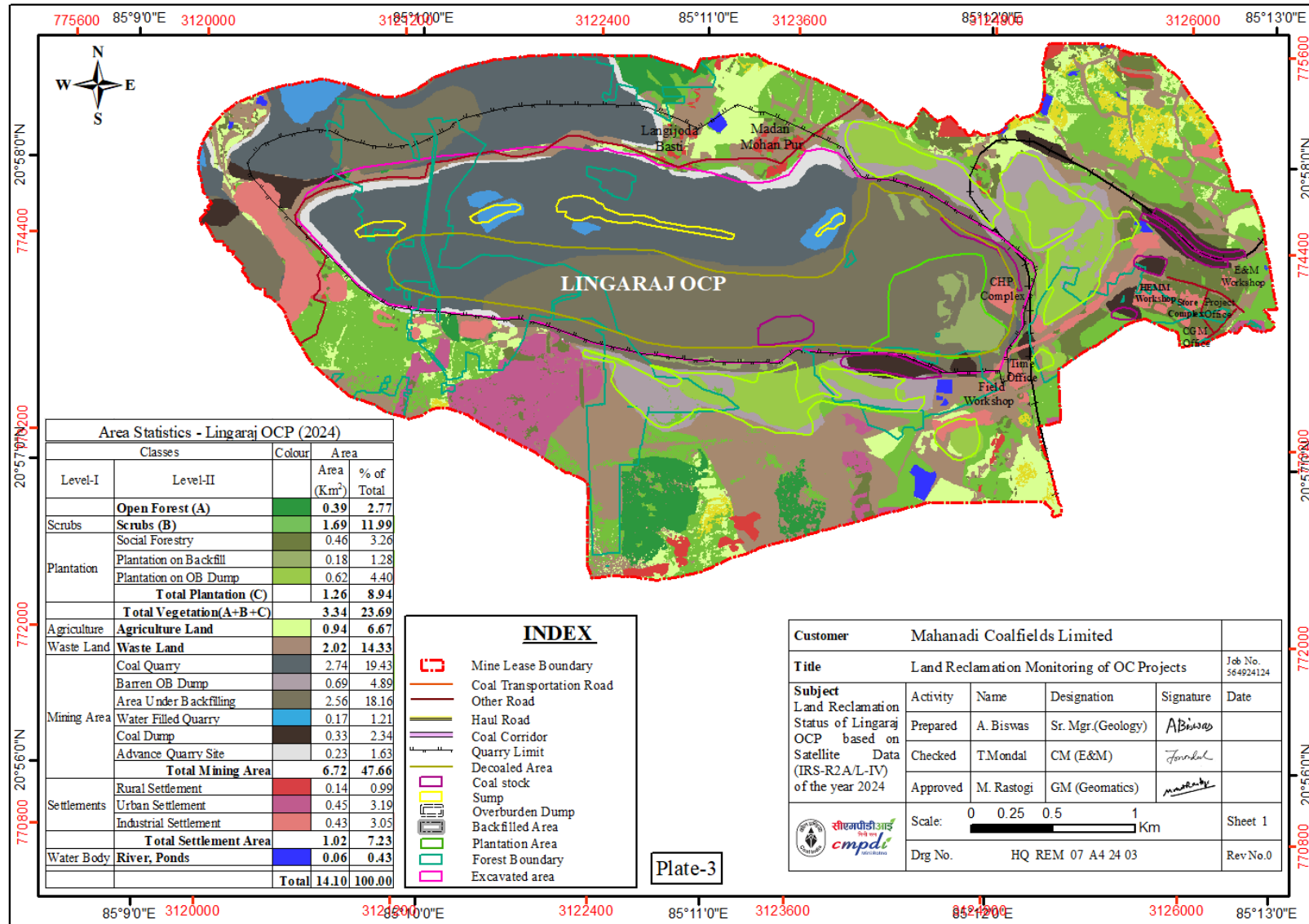


Plate 8-3: Land Use/Cover map of Lingaraj OCP

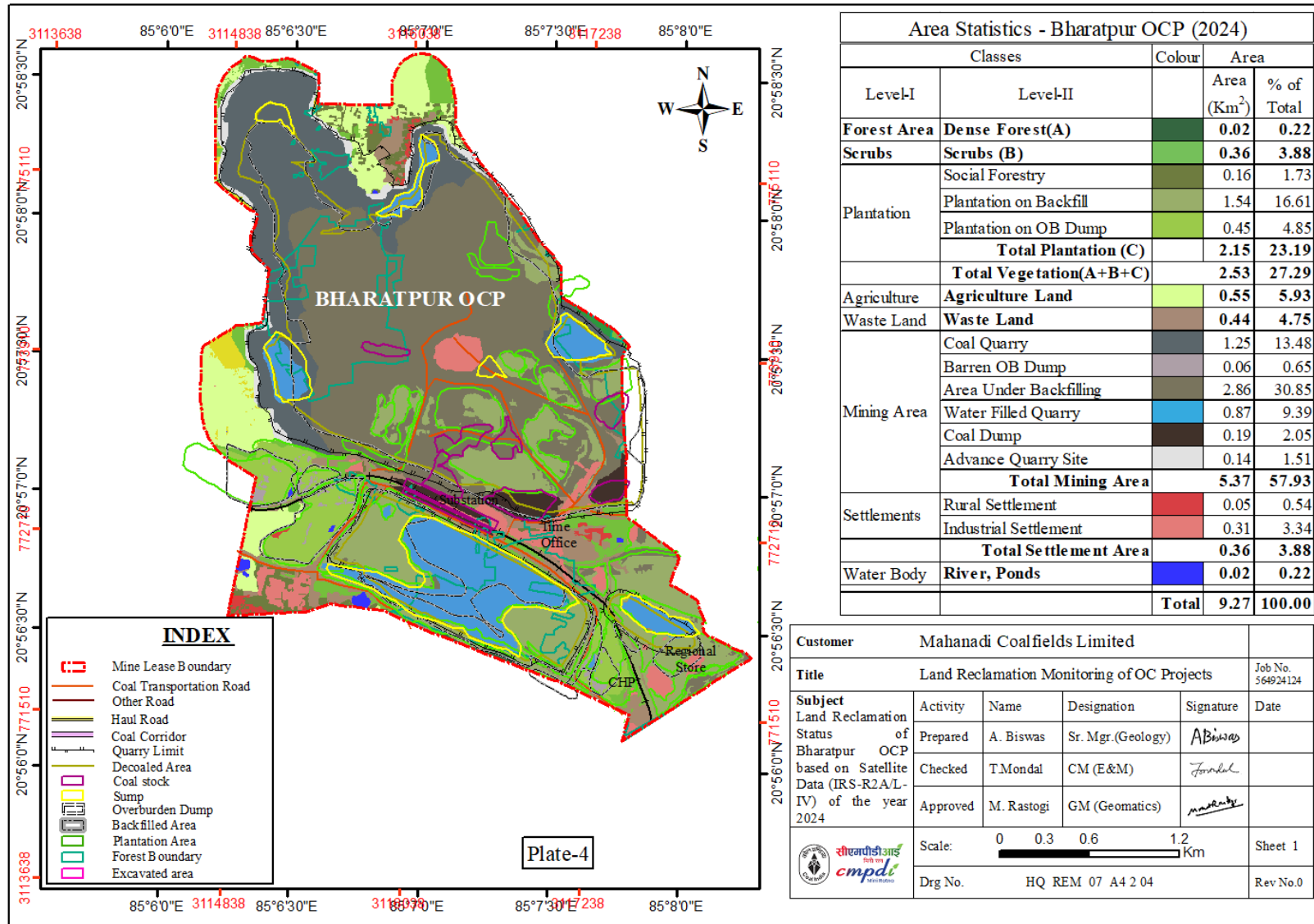


Plate 8-4: Land Use/Cover map of Bharatpur OCP

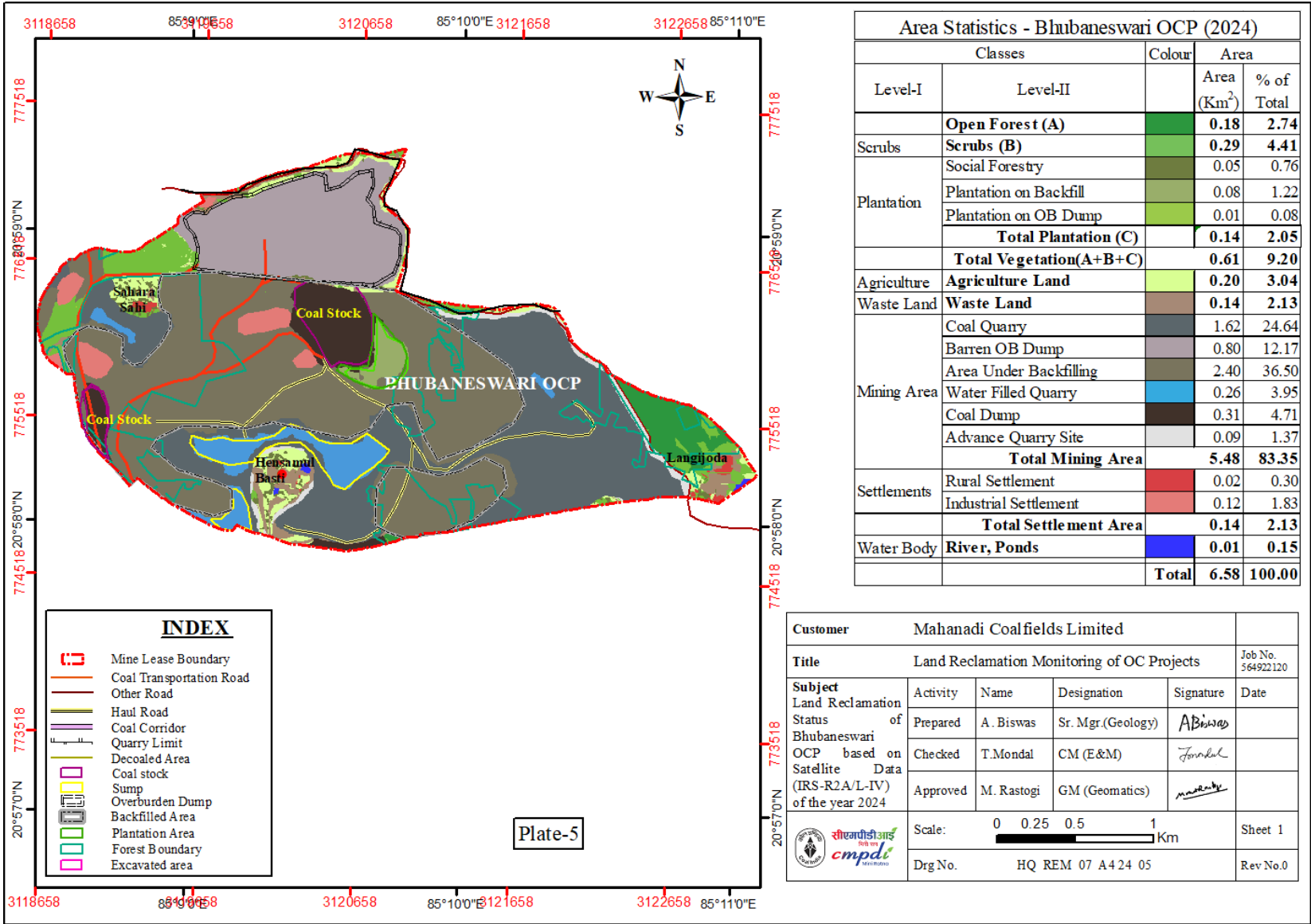


Plate 8-5: Land Use/Cover map of Bhubaneswari OCP

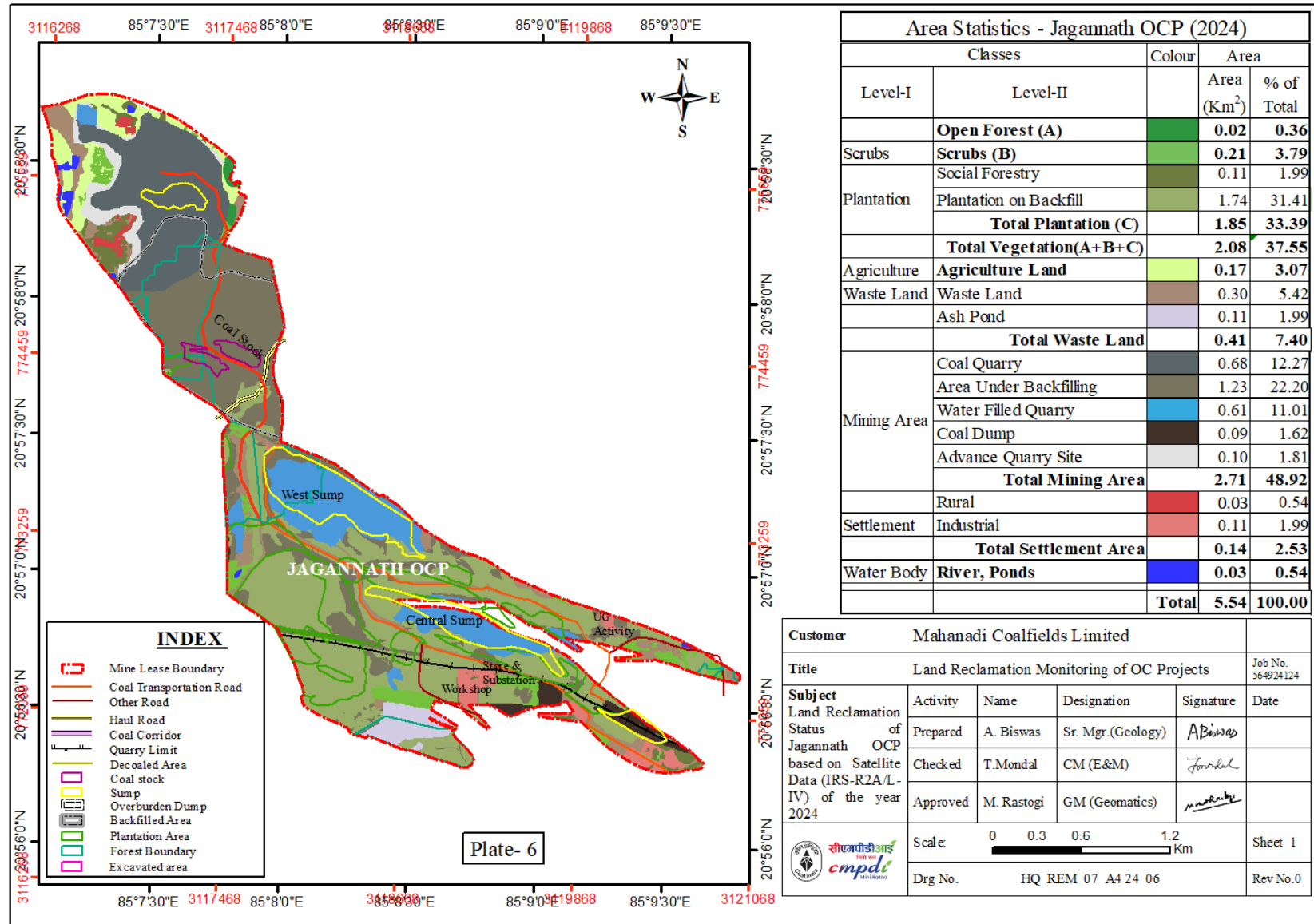


Plate 8-6: Land Use/Cover map of Jagannath OCP

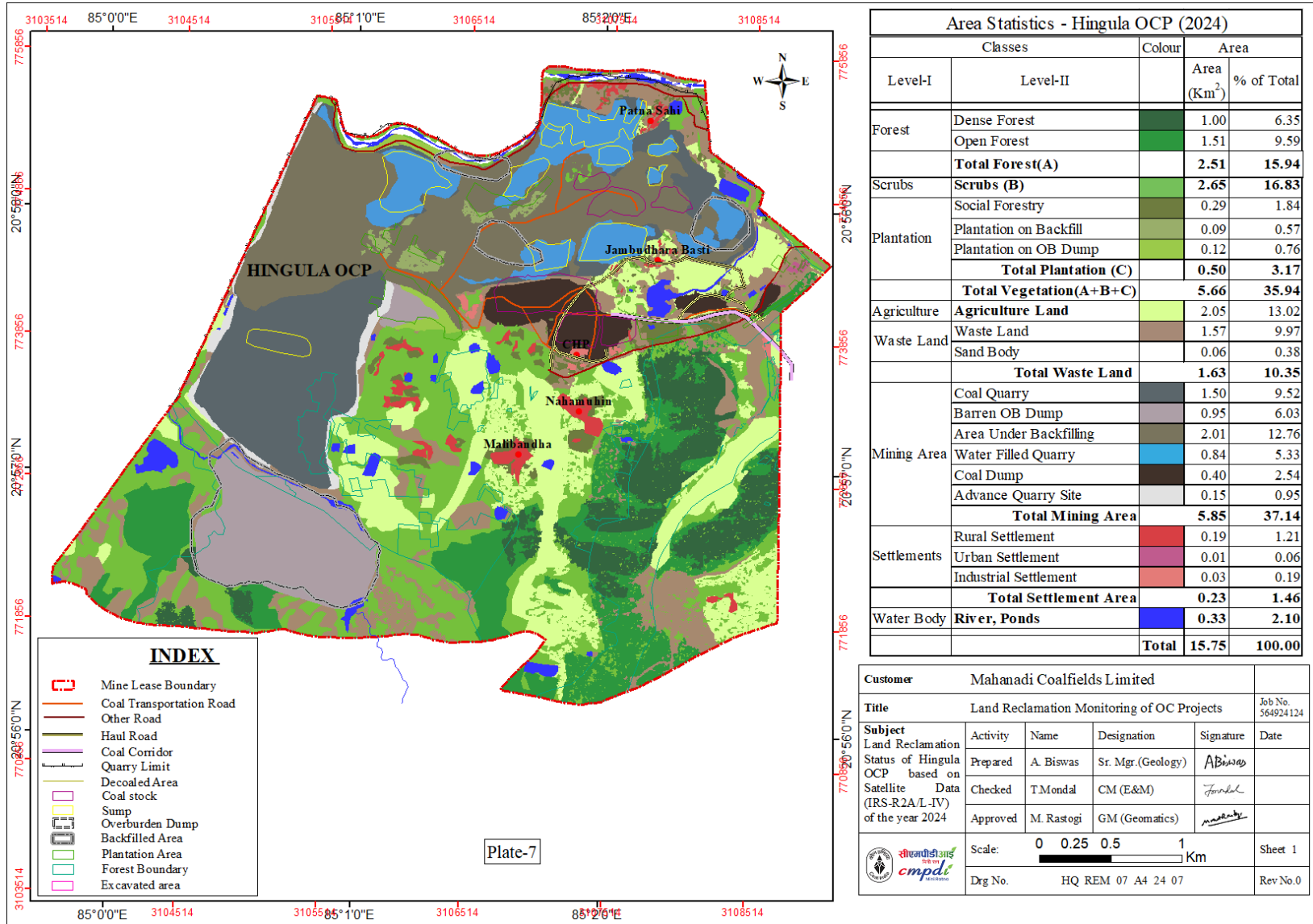


Plate 8-7: Land Use/Cover map of Hingula OCP

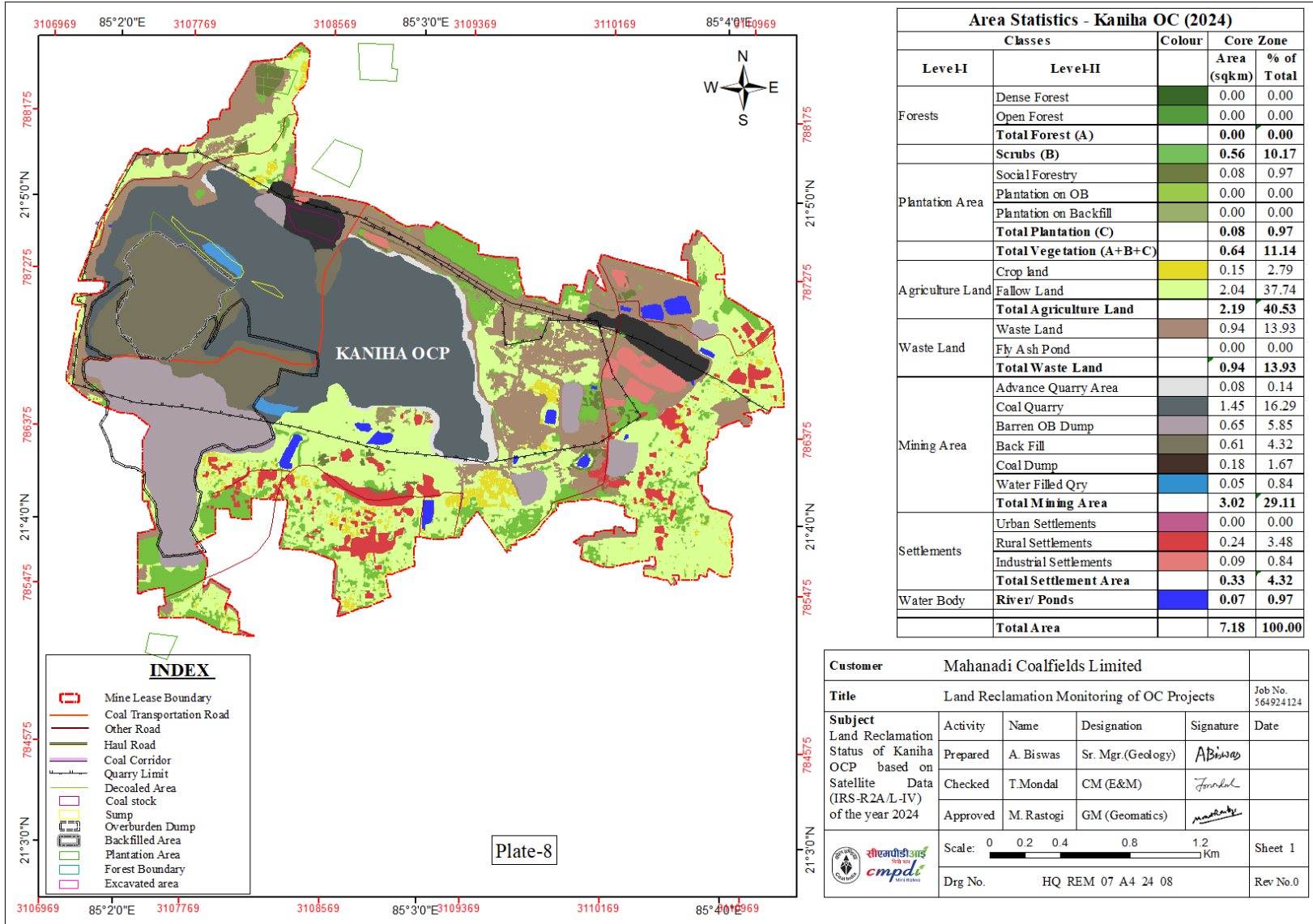


Plate 8-8: Land Use/Cover map of Kaniha OCP

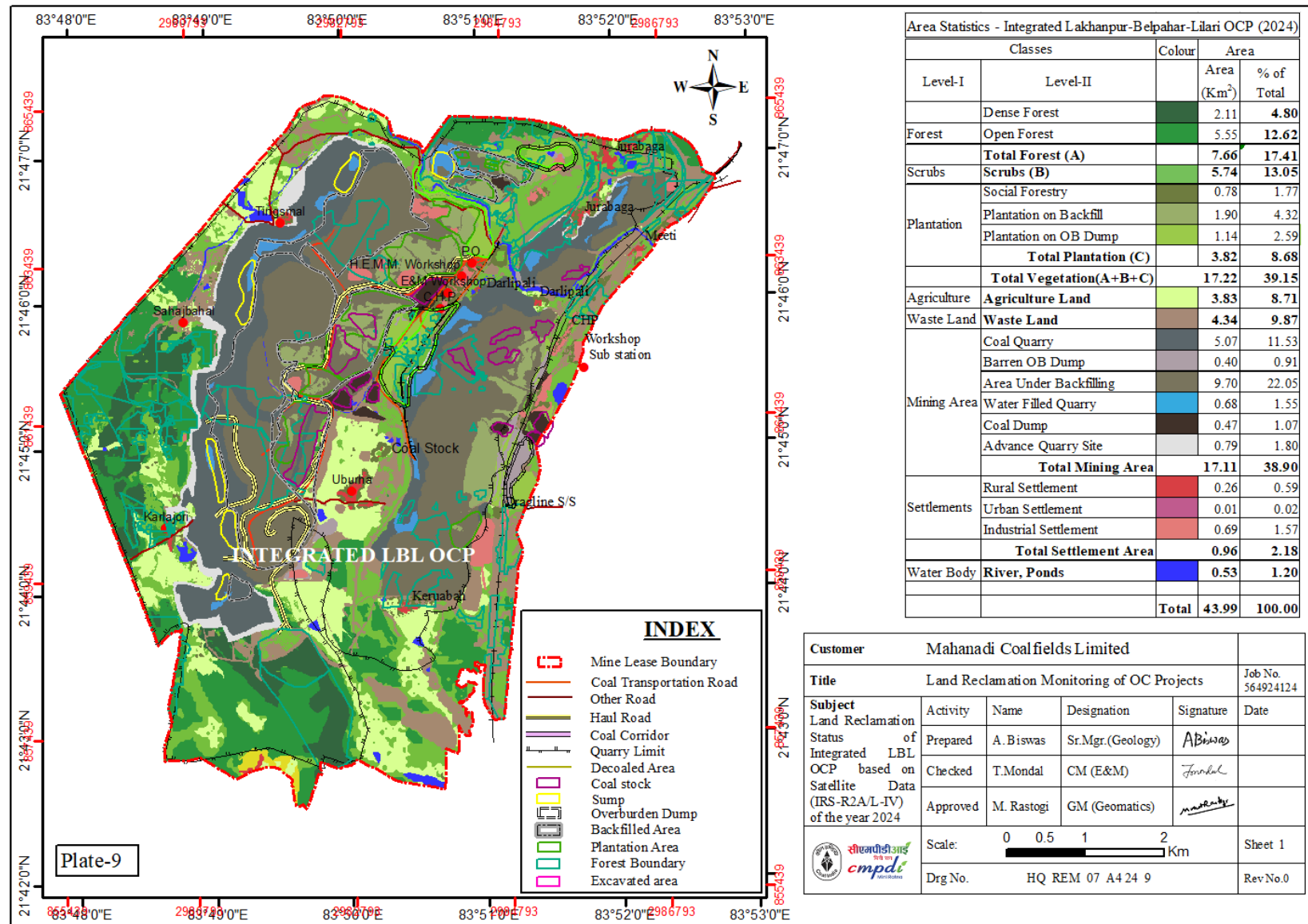


Plate 8-9: Land Use/Cover map of Integrated LBL OCP

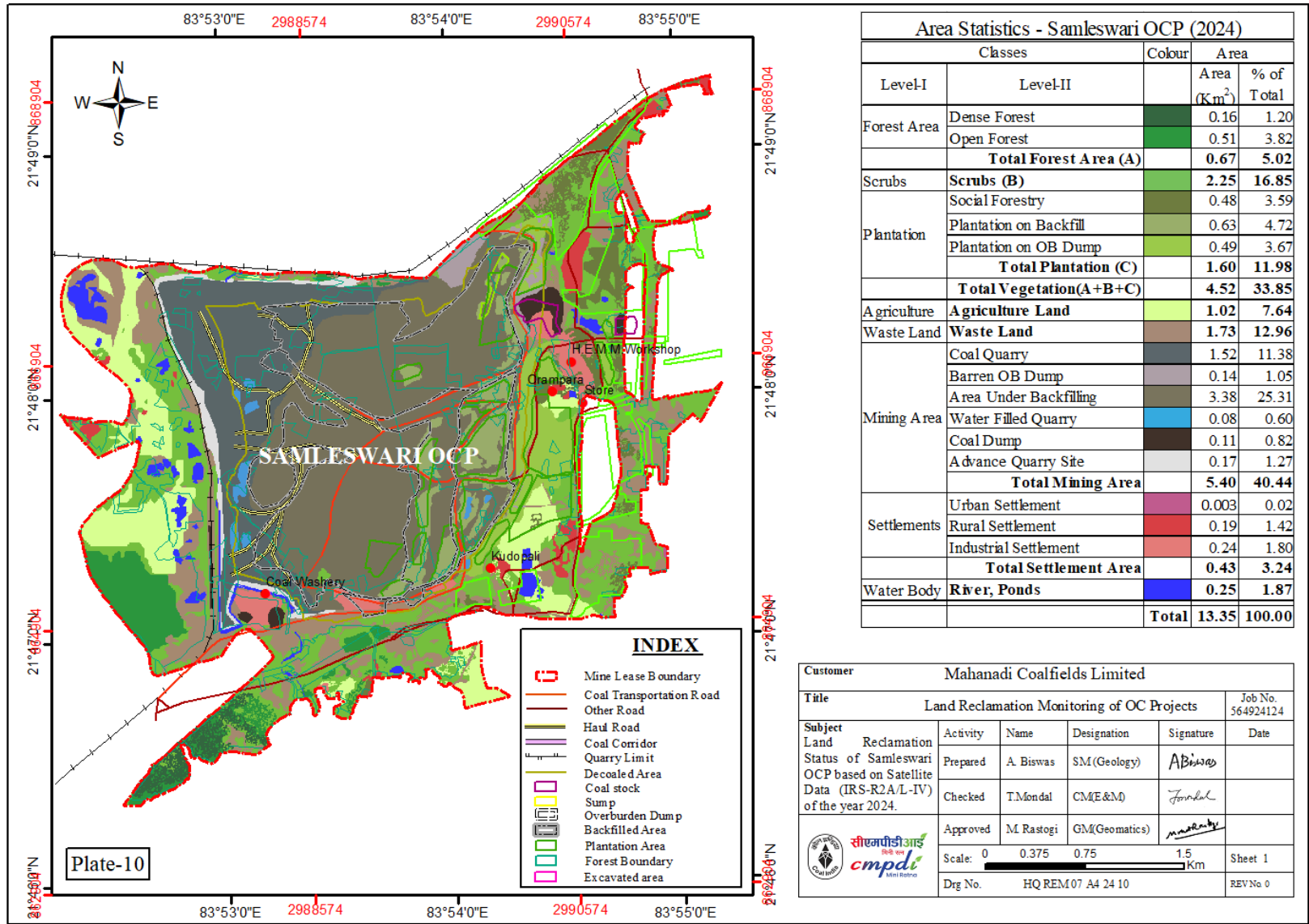


Plate 8-10: Land Use/Cover map of Samleswari OCP

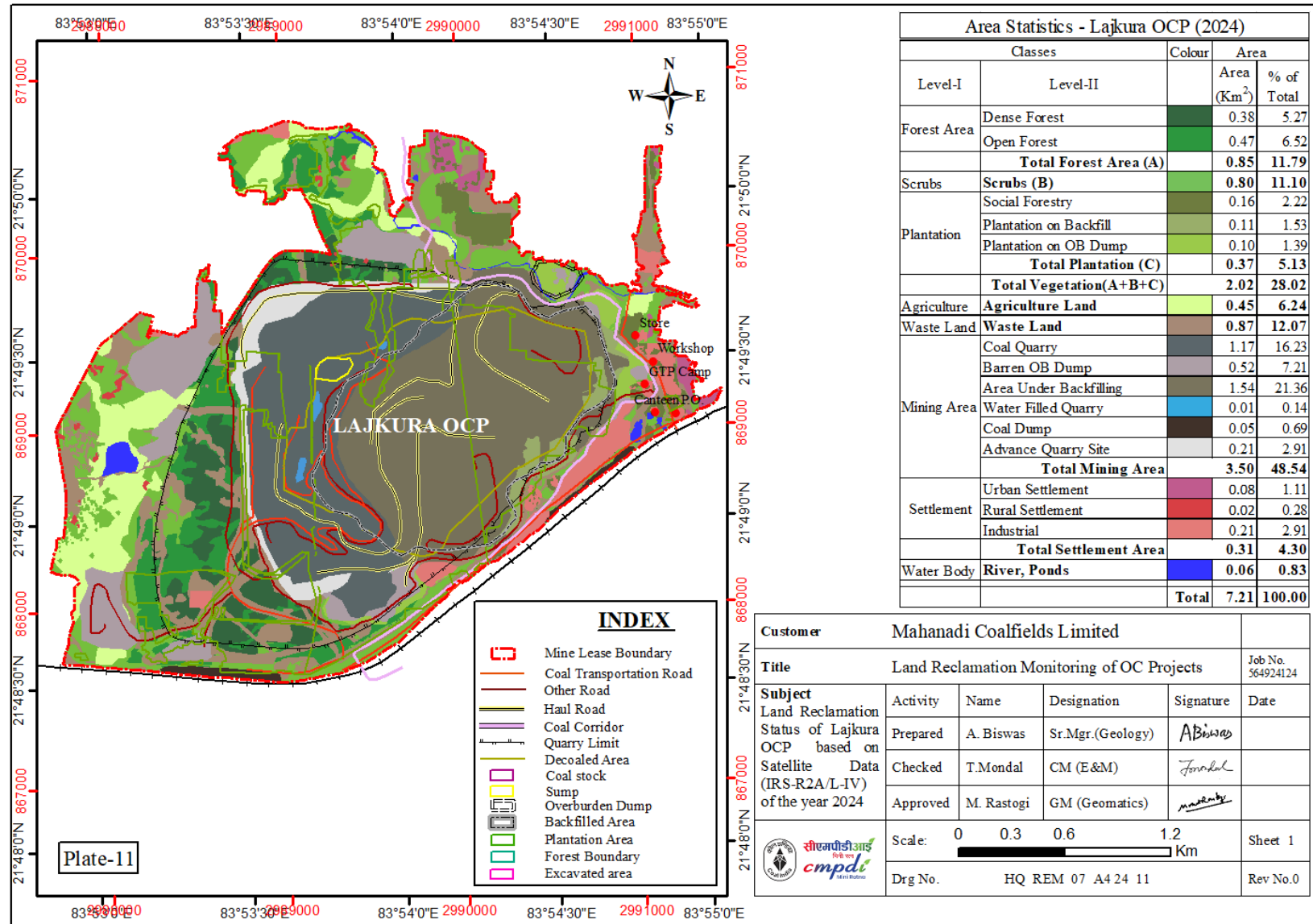


Plate 8-11: Land Use/Cover map of Lajkura OCP

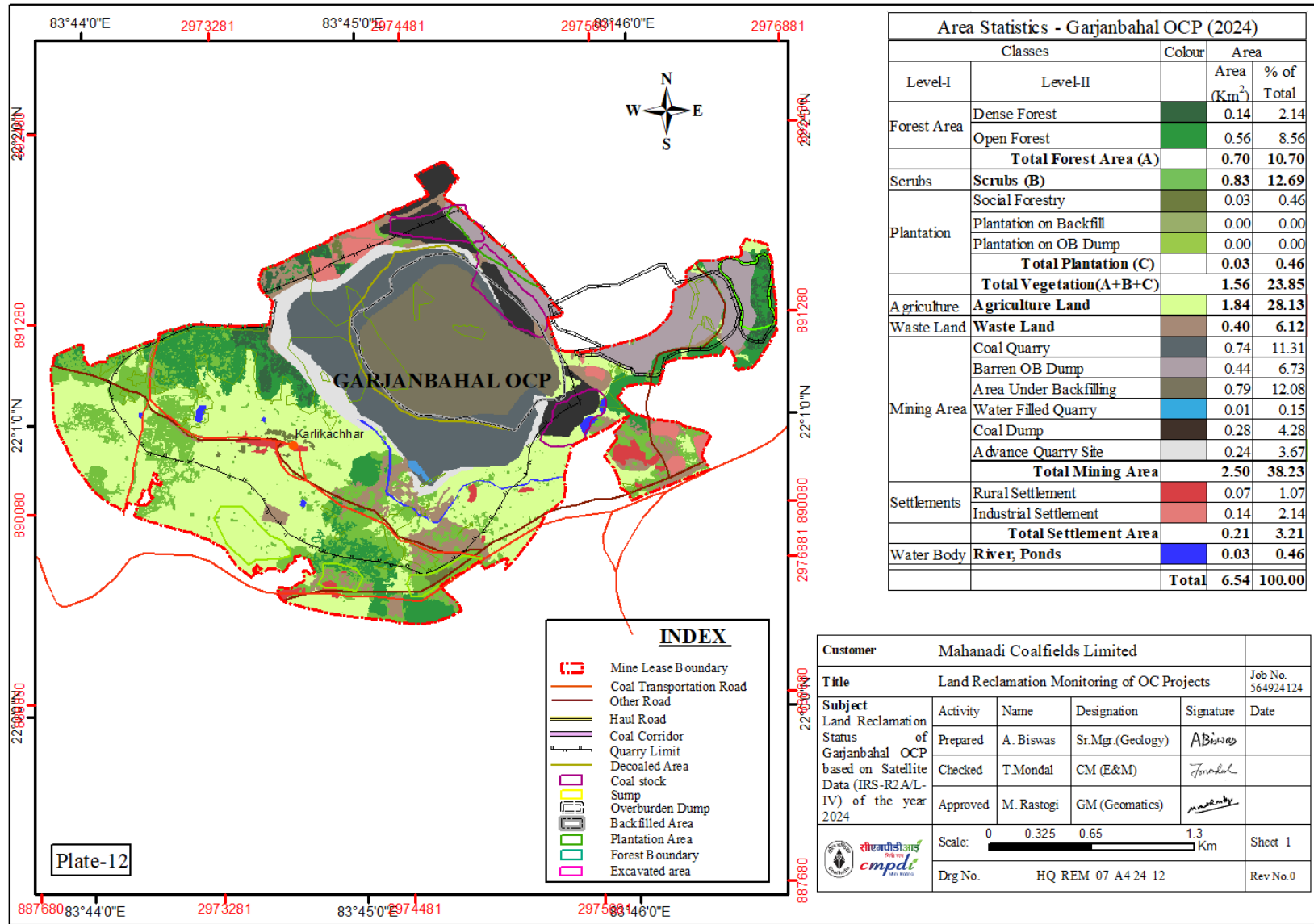


Plate 8-12: Land Use/Cover map of Garjanbahal OCP

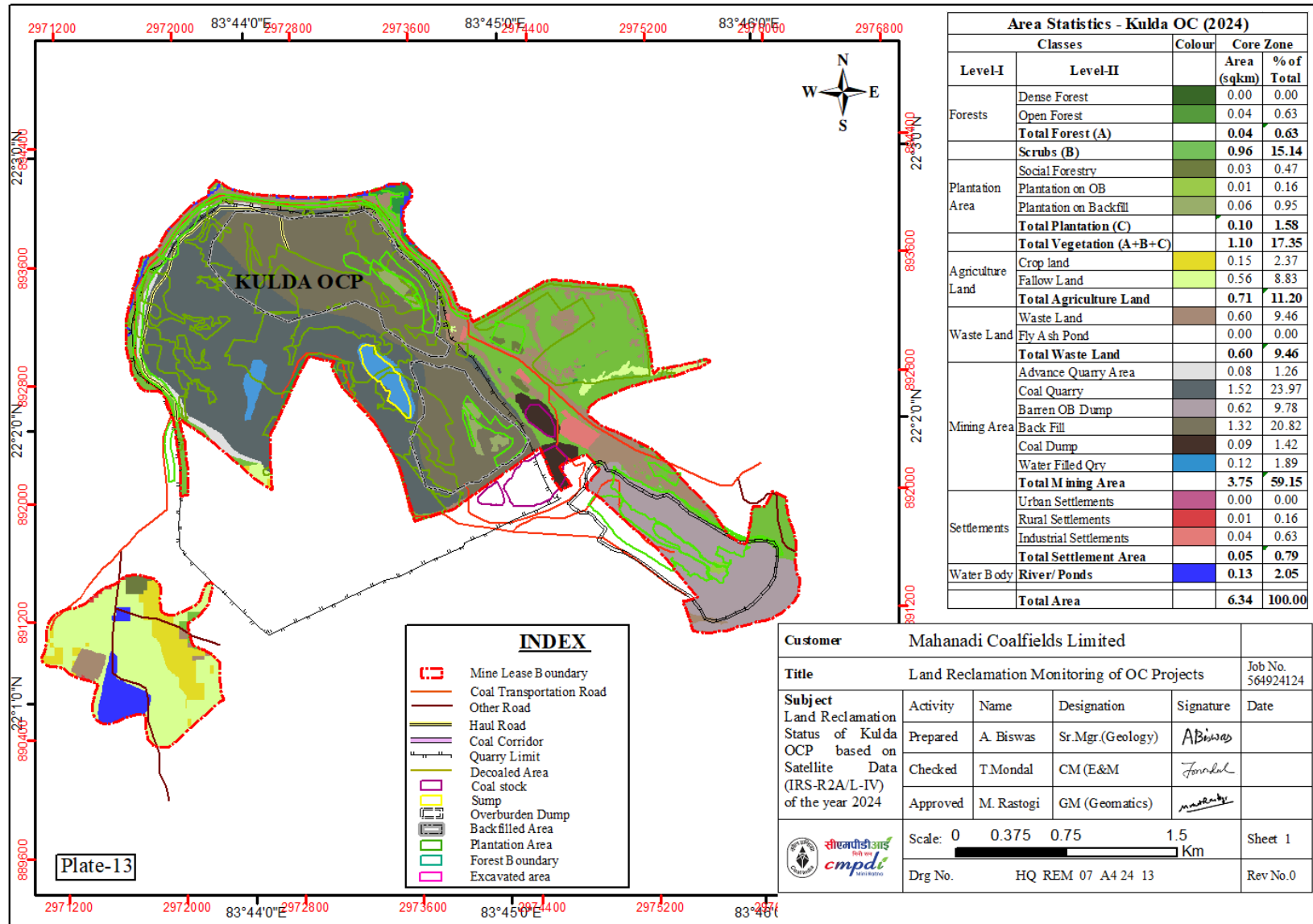


Plate 8-13: Land Use/Cover map of Kulda OCP

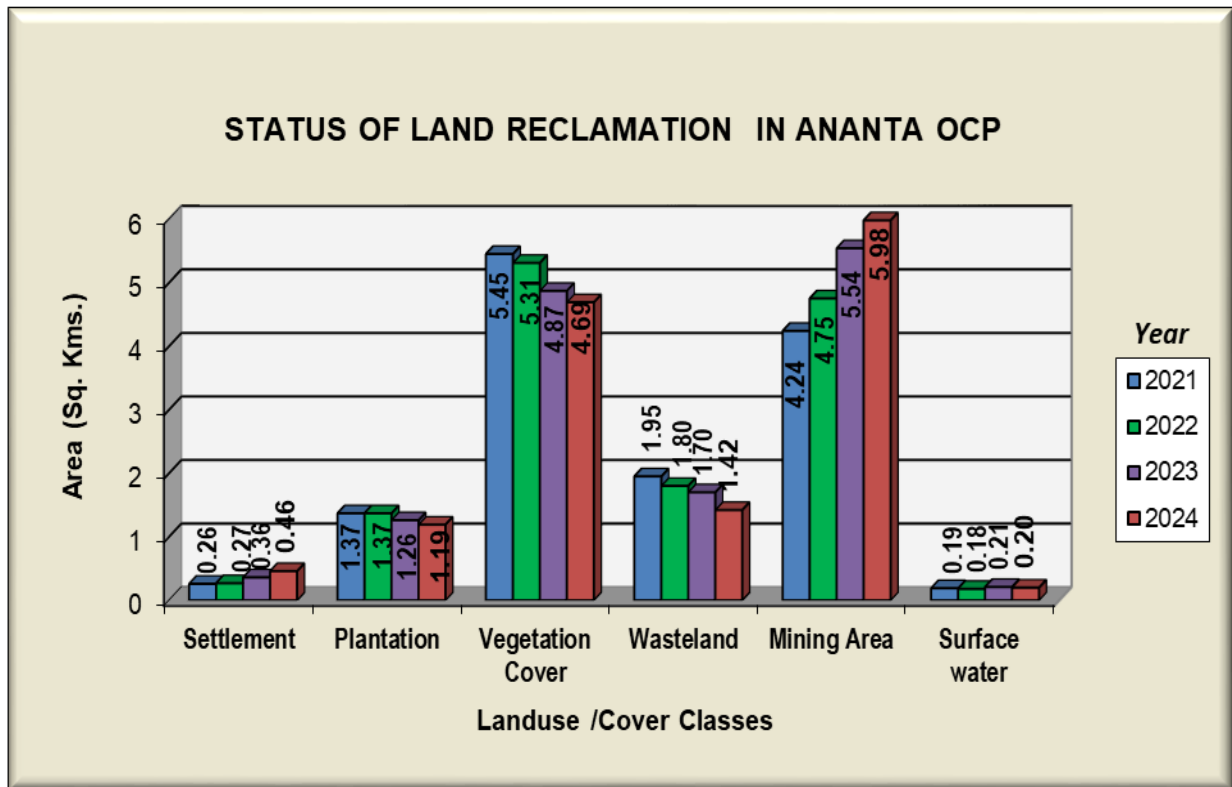


Chart 8.3: Status of Land Reclamation in Ananta OCP

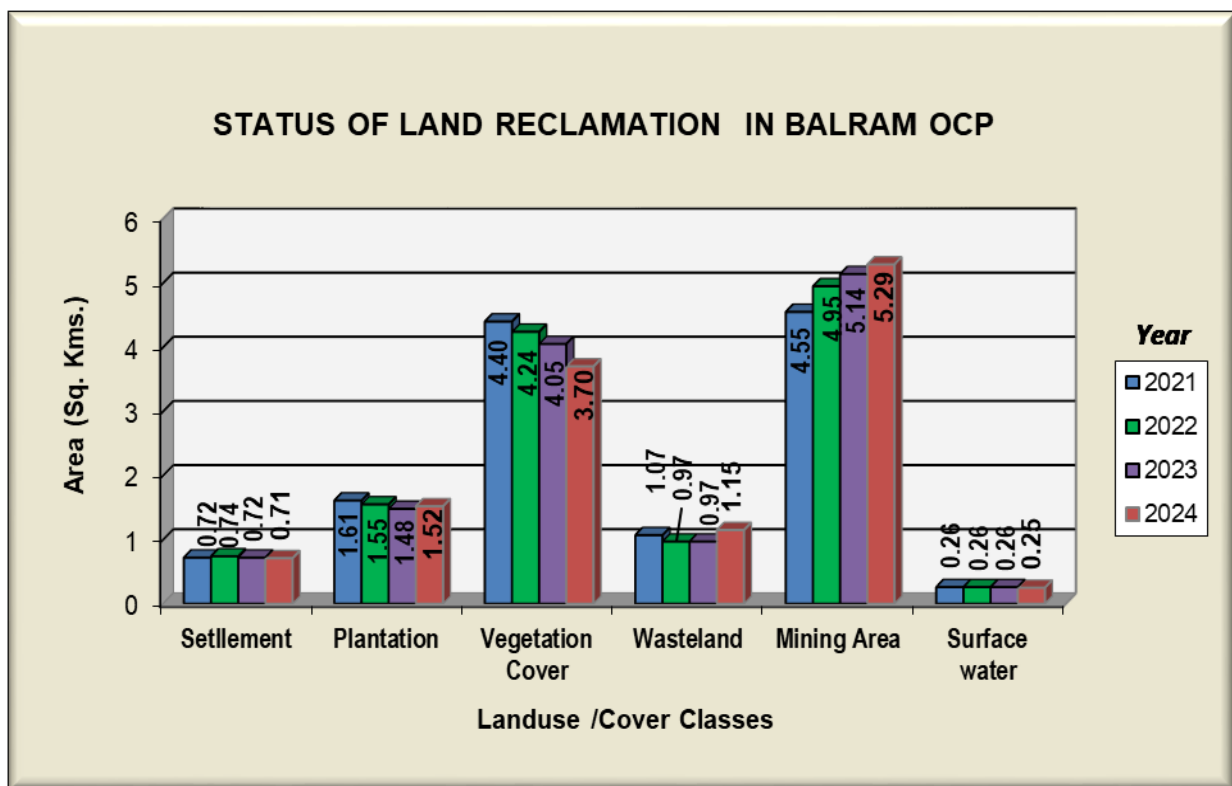


Chart 8.4: Status of Land Reclamation in Balram OCP

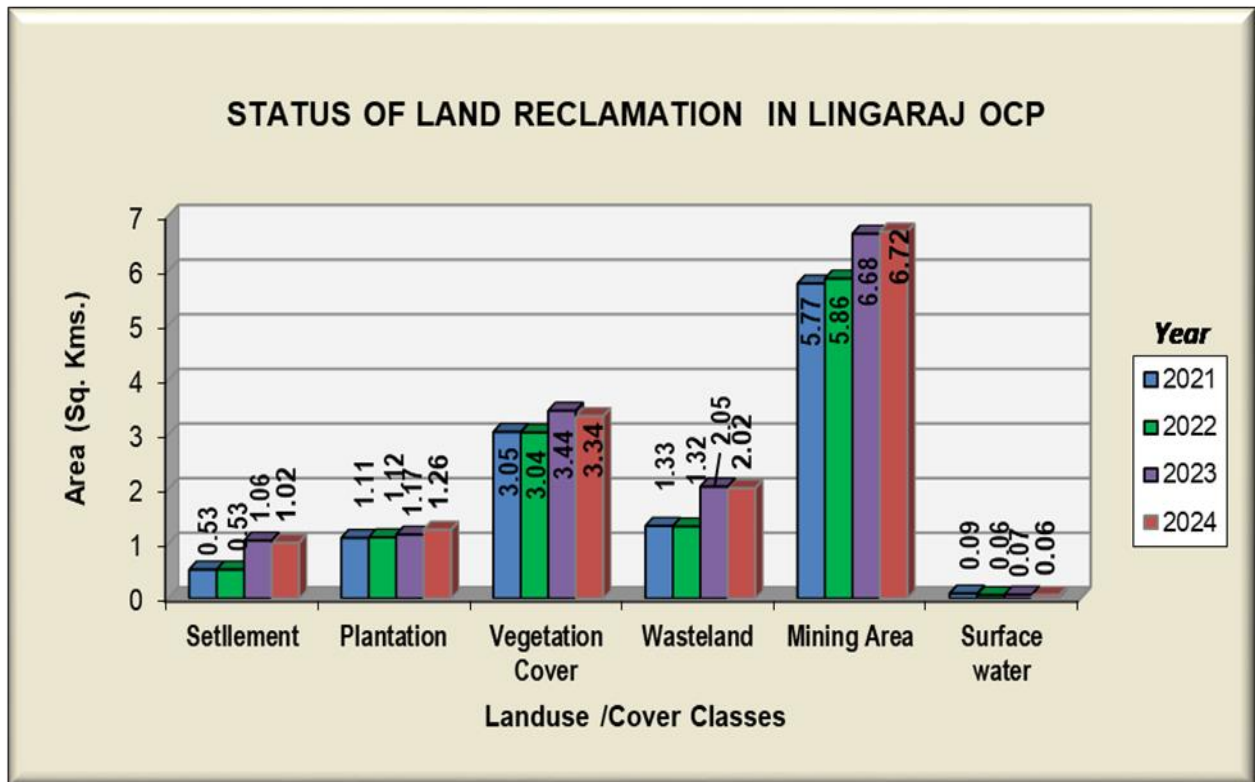


Chart 8.5: Status of Land Reclamation in Lingraj OCP

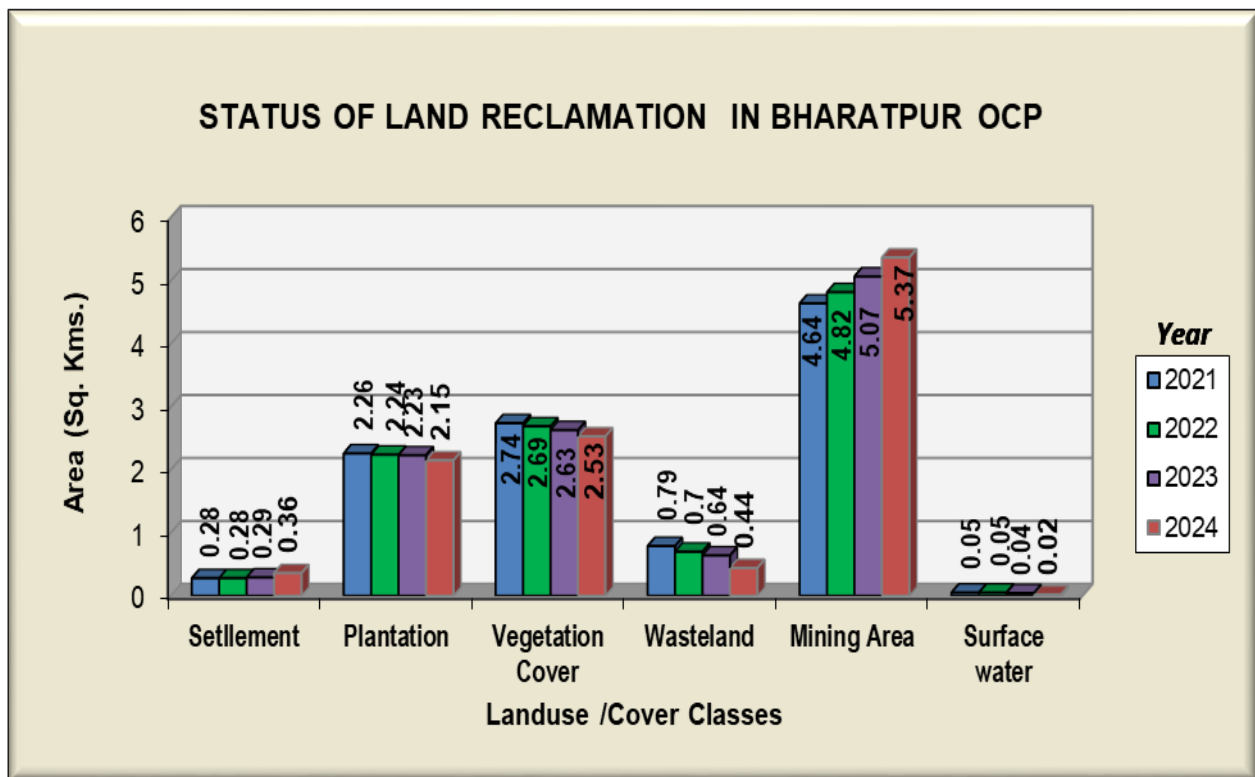


Chart 8.6: Status of Land Reclamation in Bharatpur OCP

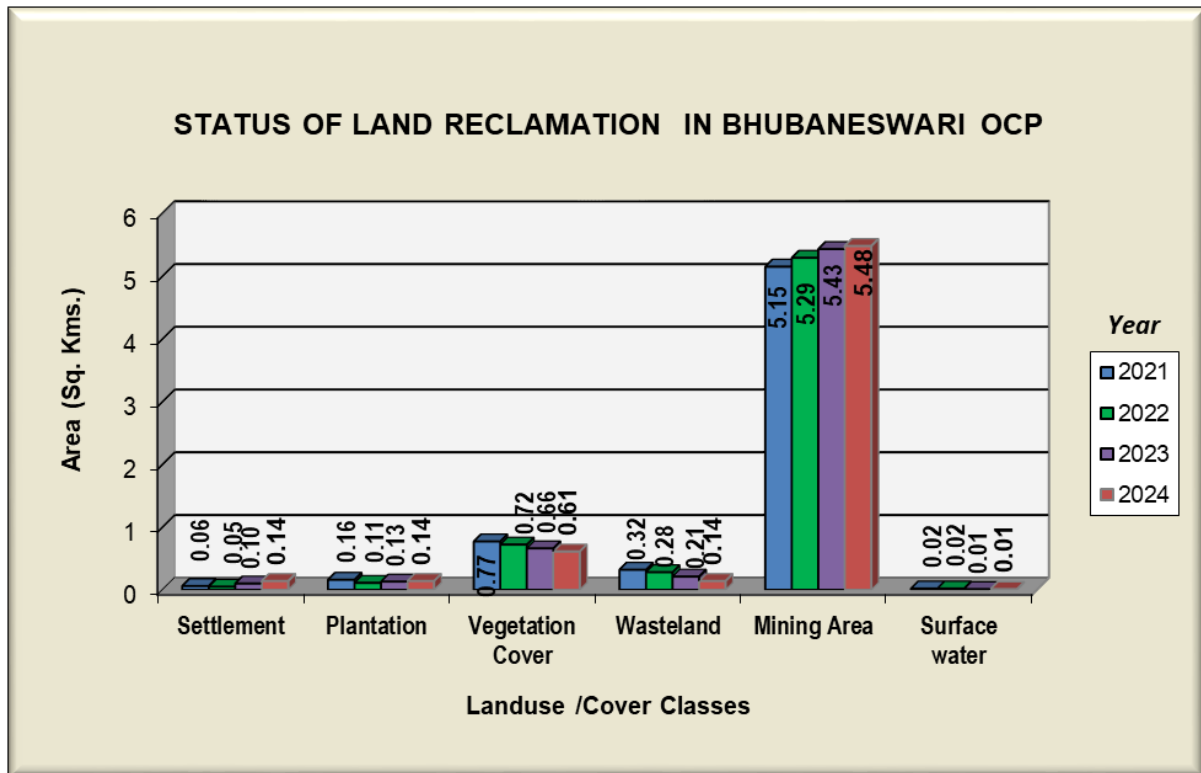


Chart 8.7: Status of Land Reclamation in Bhubaneshwari OCP

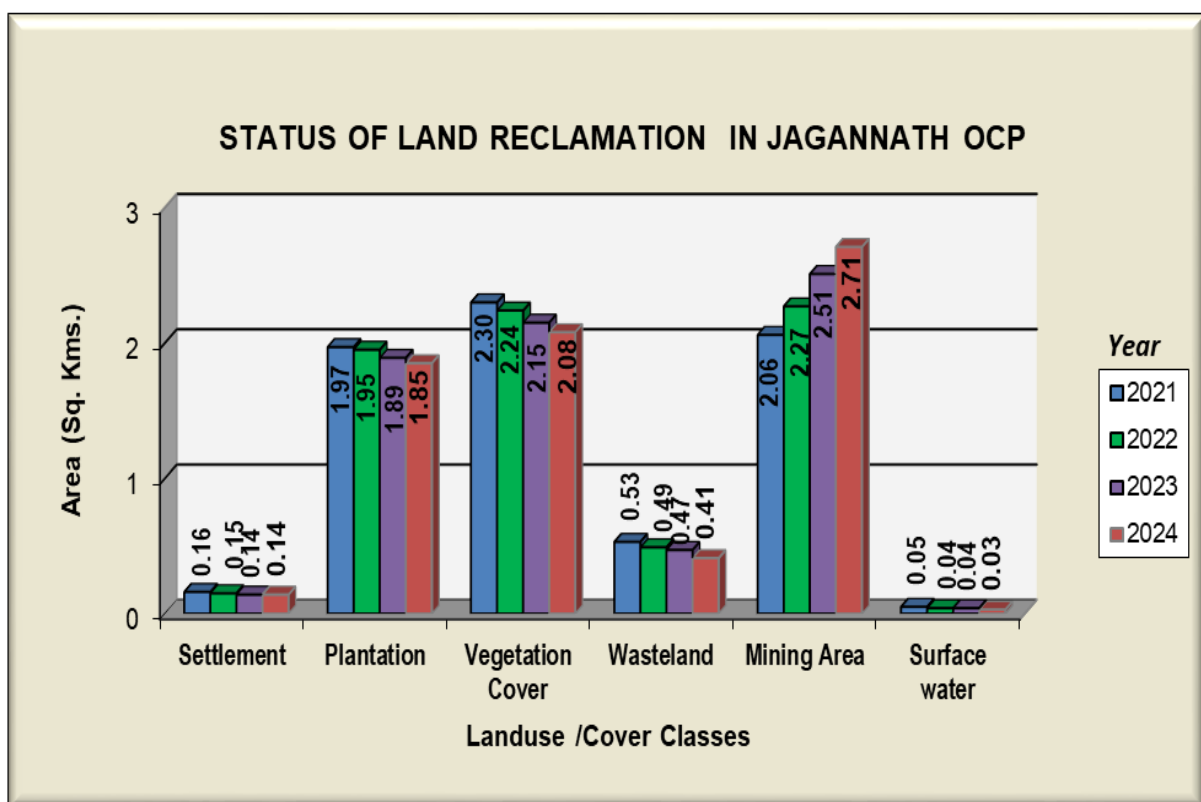


Chart 8.8: Status of Land Reclamation in Jagannath OCP

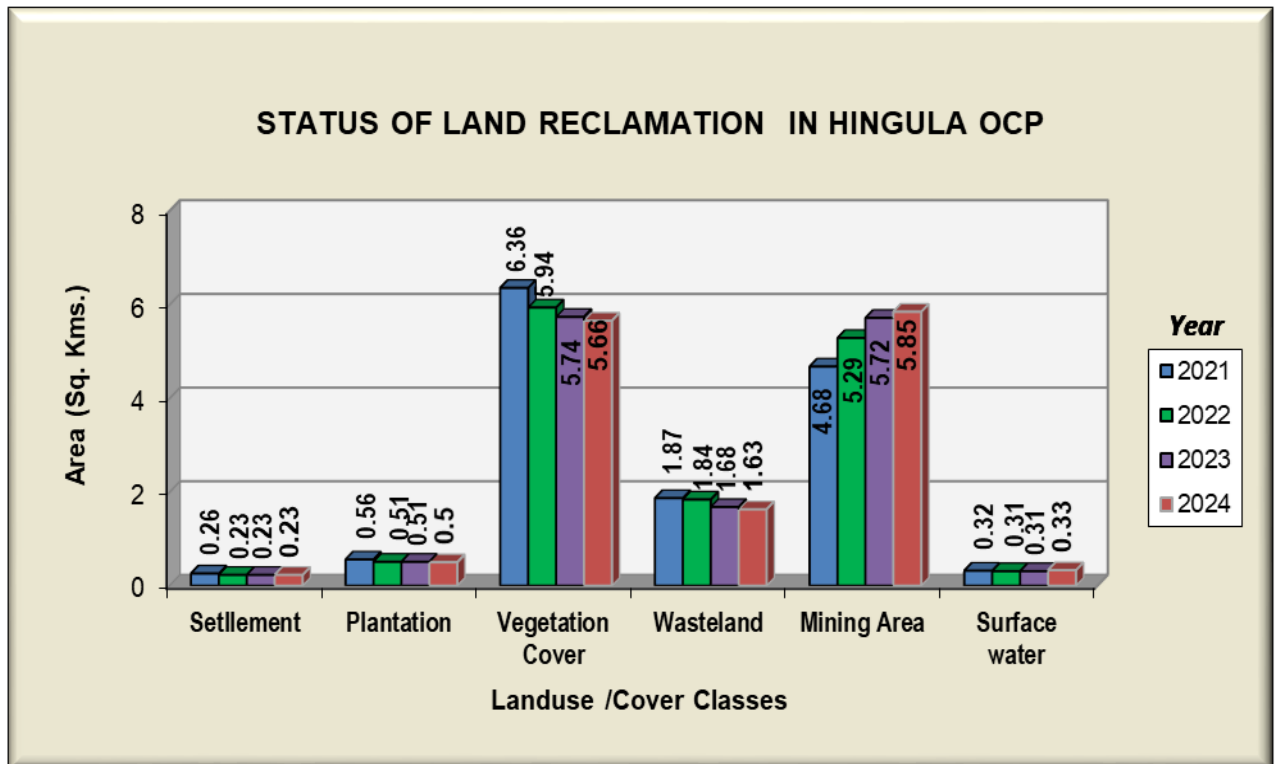


Chart 8.9: Status of Land Reclamation in Hingula OCP

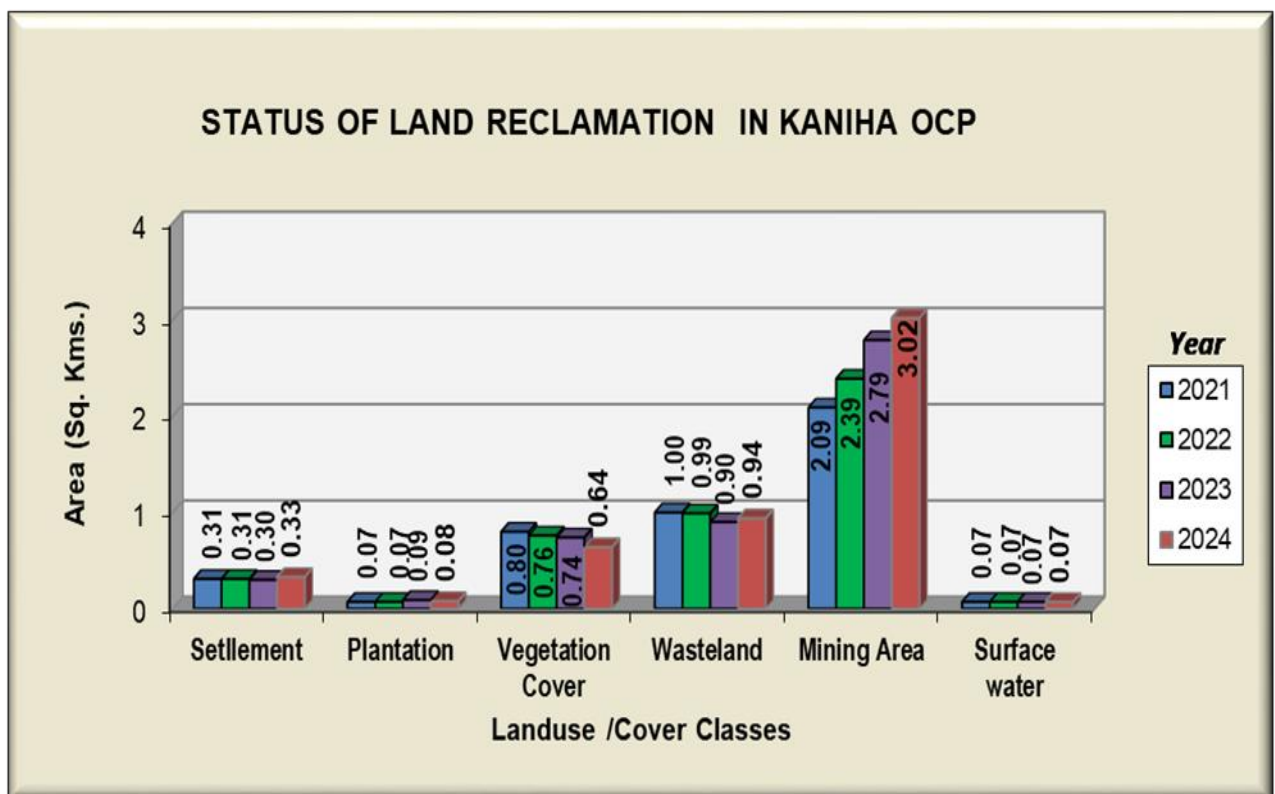


Chart 8.10: Status of Land Reclamation in Kaniha OCP

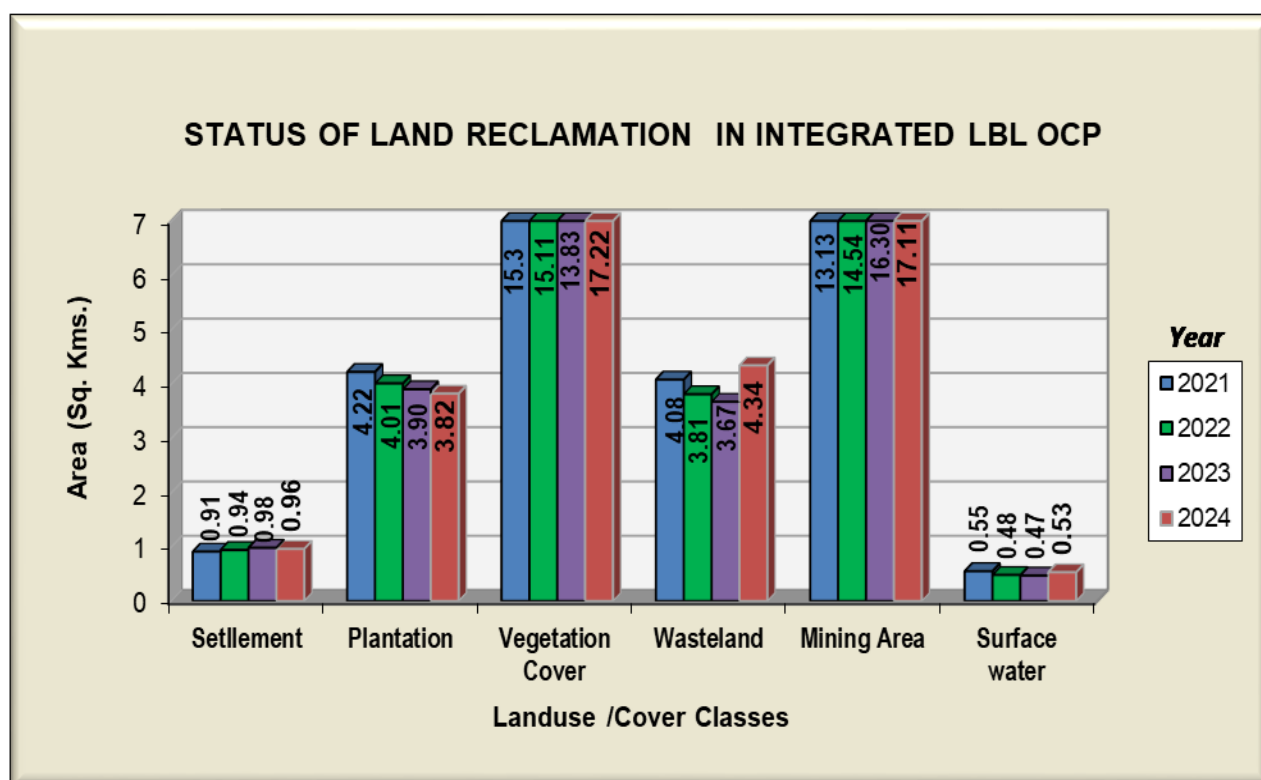


Chart 8.11: Status of Land Reclamation in Integrated LBL OCP

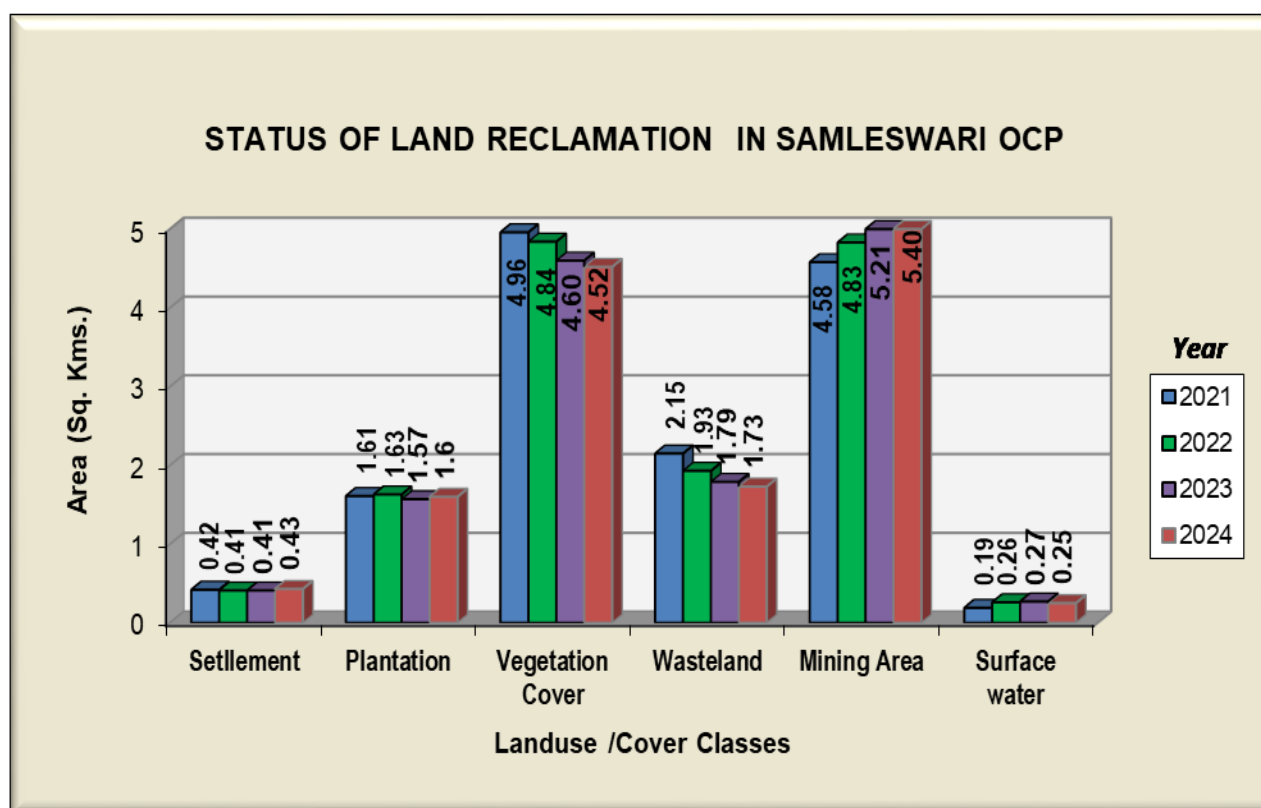


Chart 8.12: Status of Land Reclamation in Samleswari OCP

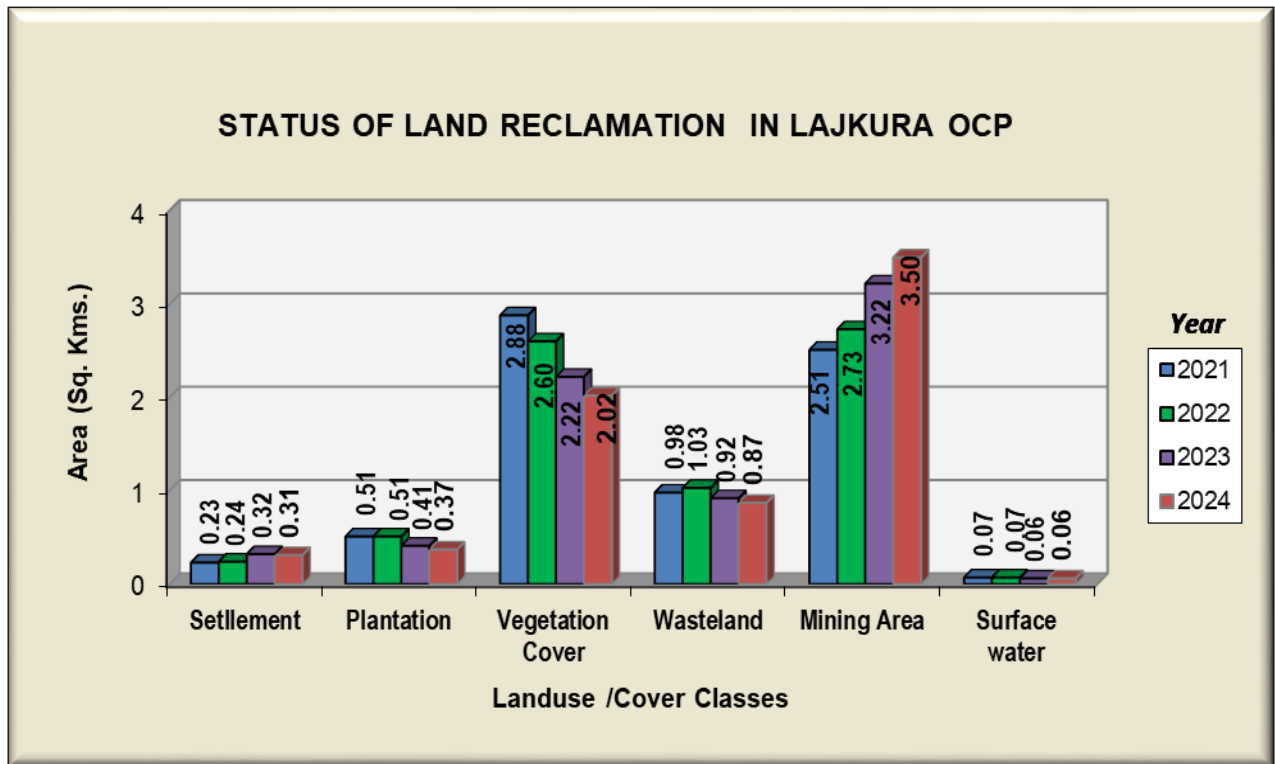


Chart 8.13: Status of Land Reclamation in Lajkura OCP

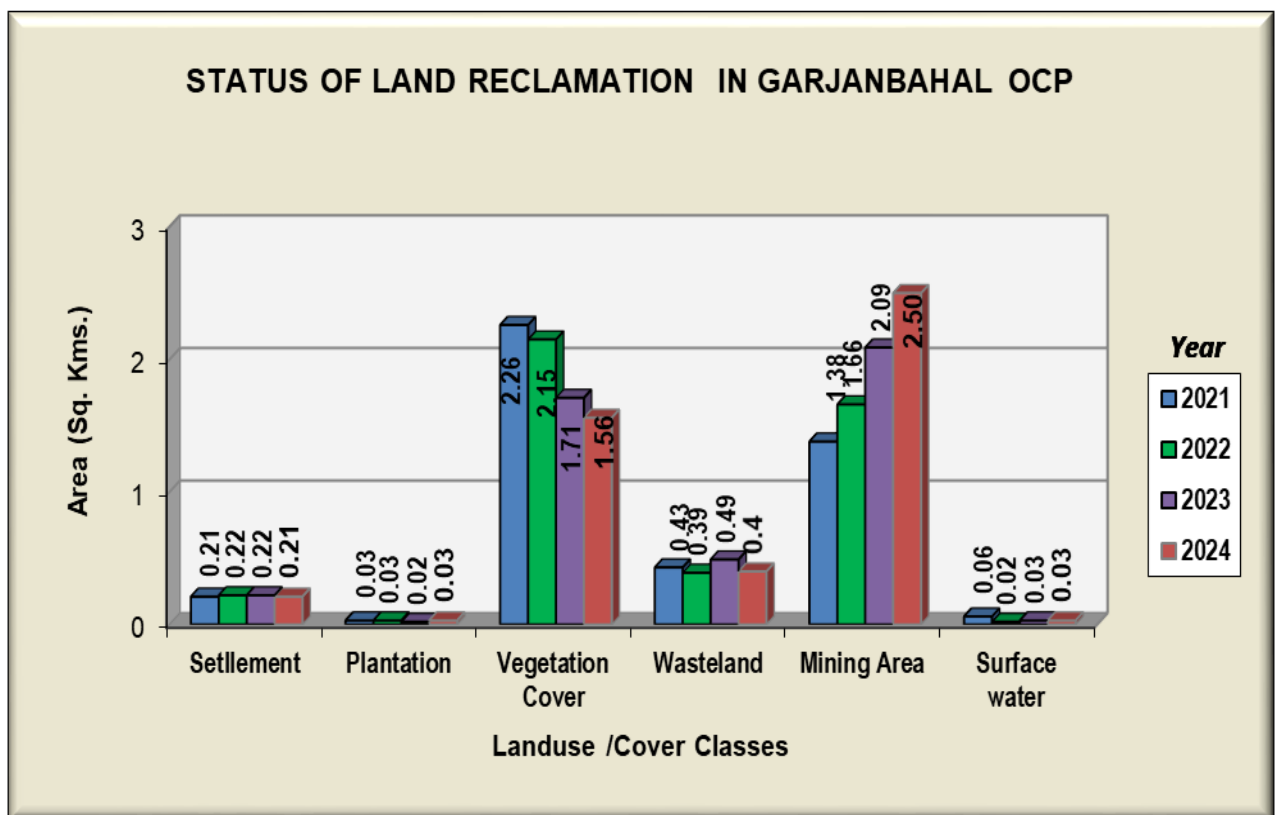


Chart 8.14: Status of Land Reclamation in Garjanbahal OCP

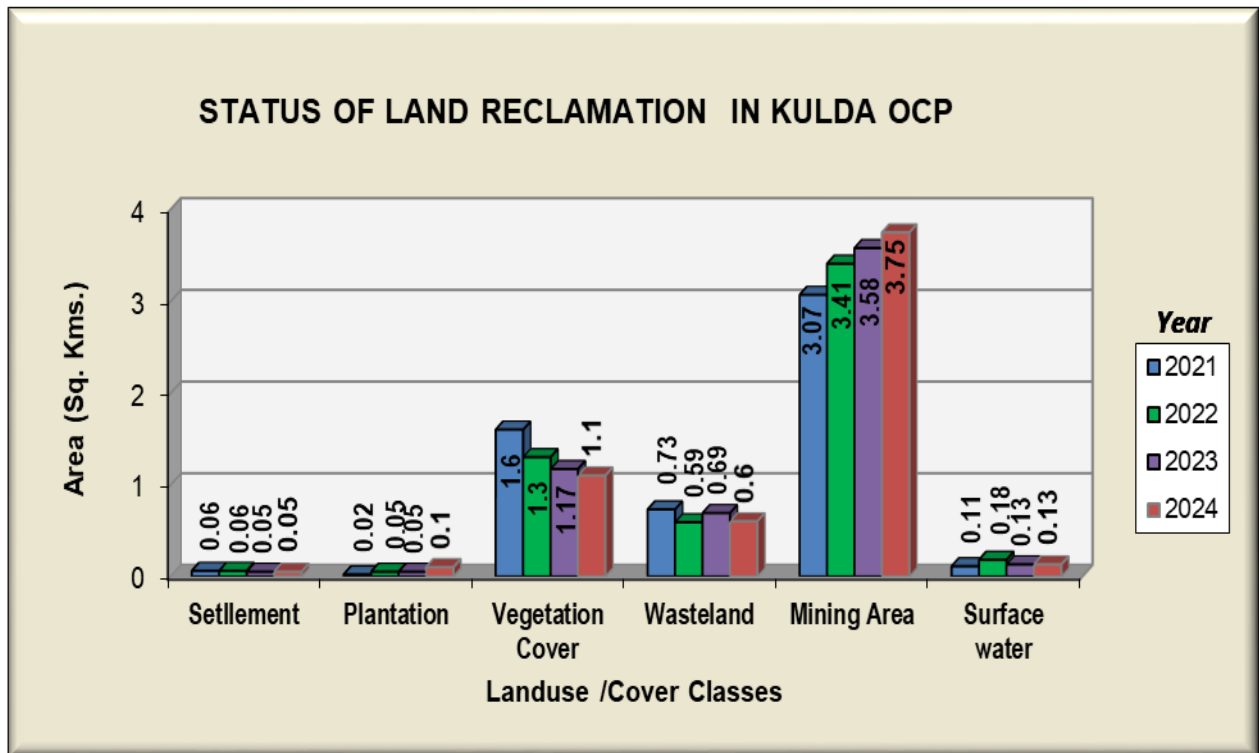


Chart 8.15: Status of Land Reclamation in Kulda OCP



Photo 8.1: Plantation on Internal OB/Backfill (Ananta OC Mine)

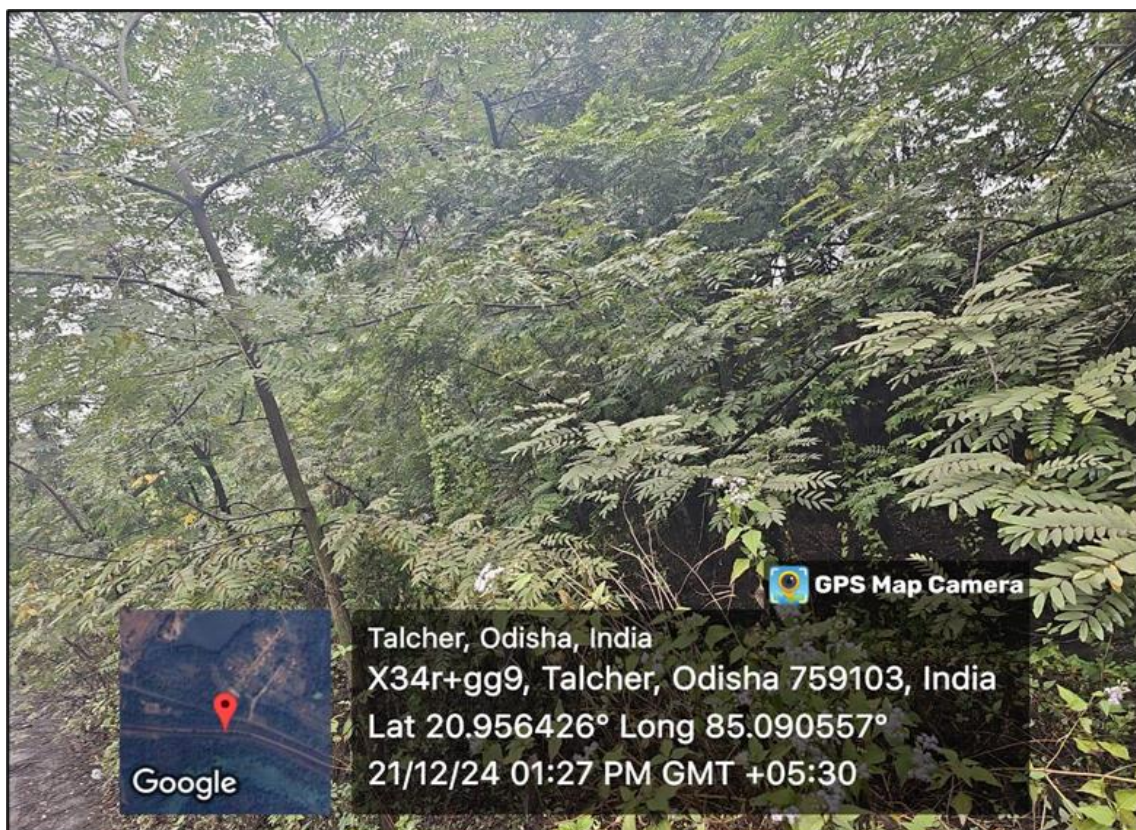


Photo 8.2: Plantation on Internal OB/Backfill (Balram OC Mine)



Photo 8.3: Plantation on Internal OB/Backfill (Bhubaneswari OC Mine)



Photo 8.4: Avenue Plantation (Hingula OC Mine)



Photo 8.5: New plantation on Internal OB/Backfill (Jagannath OC Mine)

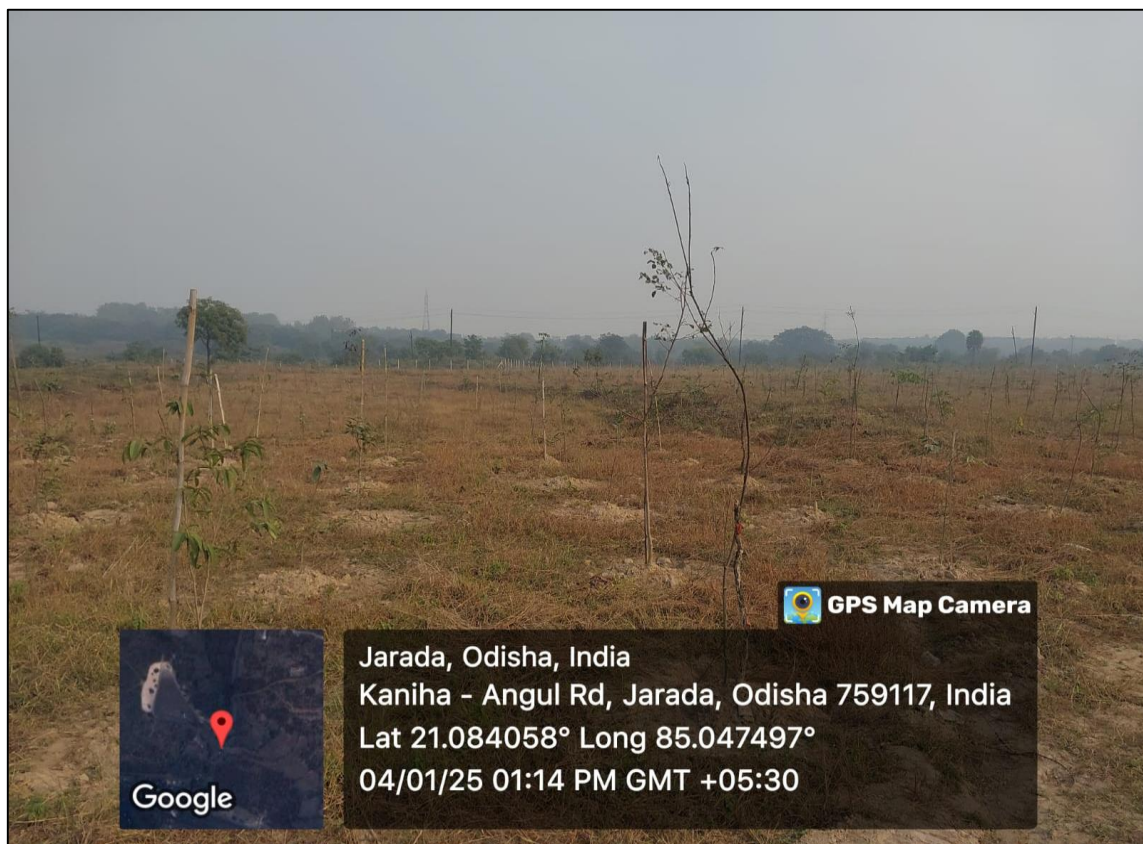


Photo 8.6: Plantation under Social Forestry (Kaniha OC Mine)



Photo 8.7: Plantation under Social Forestry (Lingaraj OC Mine)

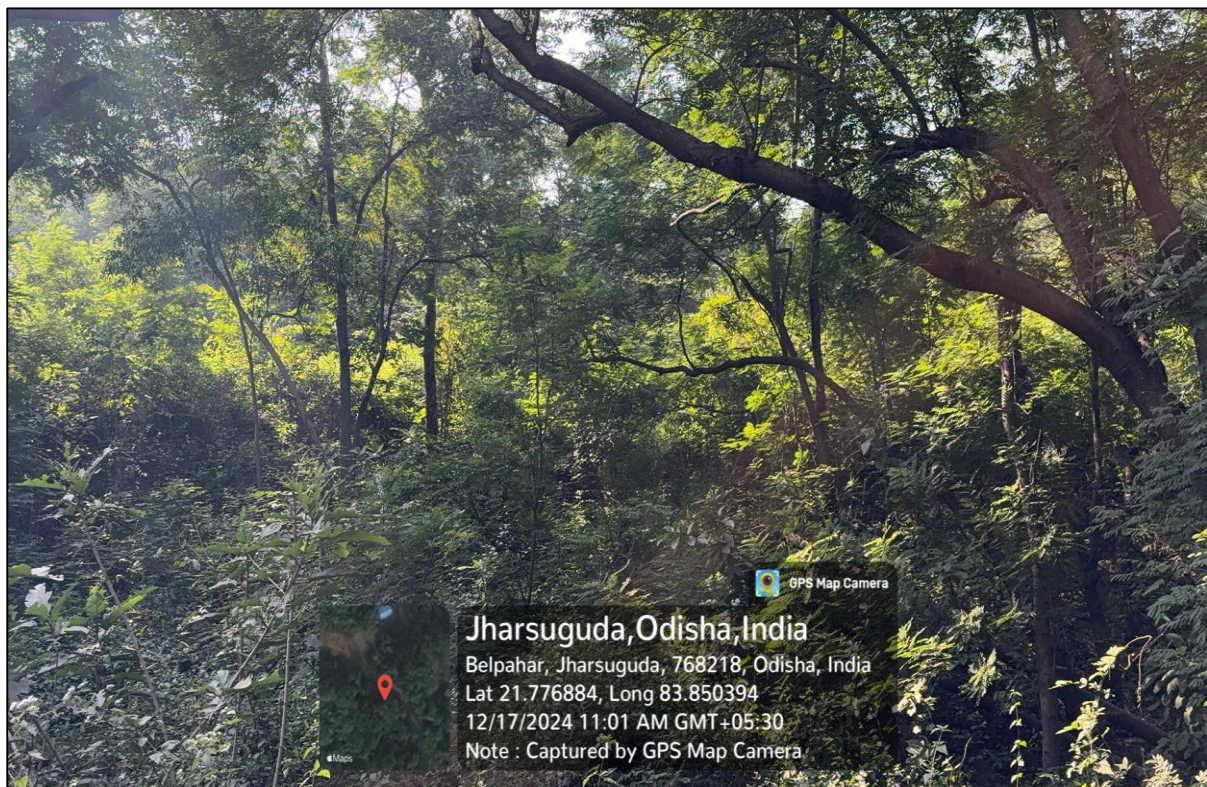


Photo 8.8: Plantation on External OB (Integrated LBL OC Mine)



Photo 8.9: Plantation on Internal OB/Backfill (Integrated LBL OC Mine)



Photo 8.10: New plantation on Internal OB/Backfill (Samleswari OC Mine)



Photo 8.11: Plantation on External OB (Garjanbahal OC Mine)



Photo 8.12: Plantation on Internal OB/Backfill (Kulda OC Mine)

CENTRAL COALFIELDS LIMITED

9. Land Reclamation Status in Central Coalfields Ltd.

9.1 The following **6 OC** projects of Central Coalfields Ltd. producing more than 5 million m³. (Coal + OB) annually, have been taken up for land reclamation monitoring based on Satellite data of the year 2024.

No.	Name of OC Project	Name of Coalfield
1	North Urimari	South Karanpura (SK)
2	Ashok	North Karanpura (NK)
3	Magadh	
4	Amrapali	
5	Tapin North	West Bokaro (WB)
6	Konar Expansion	East Bokaro (EB)

9.2 Area statistics of different land use/ cover classes present in the leasehold area of the above 06 projects of CCL for the year 2024 are shown in Table 9.1. Land use/ cover maps derived from satellite data are shown in Plate 9.1 – 9.15. Year wise changes in different land use/ cover classes in the last three years based on satellite data are shown in Bar charts in Fig. 9.2 – 9.16.

9.3 Study based on Satellite data of the year 2024 reveals that out of total excavated area of 15.69 km², an area of 9.59 km² (61.12%) has come under the process of reclamation in the above 6 OC projects of CCL taken together. Out of which, 7.81 km²(49.78%) area has come under backfilling (Technical Reclamation) and 1.78 km² (11.34%) area has come under plantation (Biological Reclamation).

9.4 Study also reveals that the area under backfilling (Technical Reclamation) has increased from 7.16 km² in 2023 to 7.81 km² in 2024.

9.5 Analysis of satellite data also indicates that the area under plantation (Biological Reclamation) has decreased from 1.91 km² (Yr. 2023) to 1.78 km² (Yr. 2024). This decrease is due dumping of over burden on biologically reclaimed area and rehandlling occuring in one or

two mines. Though there has been continuous efforts on part of the company CCL in reclamation activities for environmental protection.

9.6 It is also seen that the total area under **Green Cover** which includes plantation carried out on backfilled area, OB dumps as well as plantation done under social forestry in all the 06 mines taken together of CCL has decreased from 2.57 km² in the year 2023 to 2.31 km² in the year 2024.

9.7 The total area under reclamation also increased from 9.07 km² (61.91%) in 2023 to 9.59 km² (61.12%) in 2024.

9.8 Amrapali OCP has successfully carried out plantation on OB dumps, and on slopes of OB dumps through the method of seed ball throwing. Plantations on backfilled area also have been started coming up.

9.9 Though plantation activities are being continued in Ashok OC area, biotic interferences and suspected felling of plants/ trees have been observed at some places, which may be taken care of by the concerned authorities. This has adversely affected the cumulative statistics of the area, over the past few years.

9.10 Out of 6 projects of CCL taken for land reclamation monitoring in 2023-24, Ashok OC ranks on top for land reclamation (78.45%) followed by Konar Expansion (66.34%), Amrapali (63.49%), Tapin North OC (57.63%), Magadh OC (40.63%) and North Urimari OC (34.78%).

Table 9.1: Summarized Land Reclamation Status in CCL
Summarized Land Reclamation Status in Opencast Projects of CCL based on Satellite Data of the year 2024

(Projects producing more than 5 mcm of Coal + OB annually)														(Area in Sq. Kms.)					
Sl. No.	Project	Total Mine Leasehold Area		Technical Reclamation		Plantation						Area under Active Mining	Total Excavated Area		Total Area under Plantation (% Green Cover Generated in Leasehold)		Total Area under Reclamation		
						Biological Reclamation		Other Plantations											
				Area under Backfilling		Plantation on Excavated / Backfilled Area		Plantation on External Over Burden Dumps		Social Forestry, Awanue Plantation Etc.									
1	2	3		4		5		6		7		8		9 (=4+5+8)		10 (=5+6+7)		11(=4+5)	
		2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024
1	North Urimari	5.23	5.23	0.44	0.55	0.14	0.09	0.07	0.04	0.00	0.00	1.10	1.20	1.68	1.84	0.21	0.13	0.58	0.64
				26.19%	29.89%	8.33%	4.89%					65.48%	65.22%			4.02%	2.49%	34.52%	34.78%
2	Ashok	7.93	7.93	2.54	2.52	1.27	1.23	0.00	0.00	0.15	0.11	0.91	1.03	4.72	4.78	1.42	1.34	3.81	3.75
				53.81%	52.72%	26.91%	25.73%					19.28%	21.55%			17.91%	16.90%	80.72%	78.45%
3	Magadh	17.69	17.69	0.68	0.91	0.00	0.00	0.08	0.04	0.02	0.02	1.08	1.33	1.76	2.24	0.10	0.06	0.68	0.91
				38.64%	40.63%	0.00%	0.00%					61.36%	59.38%			0.57%	0.34%	38.64%	40.63%
4	Amrapali	6.20	6.20	1.60	1.81	0.15	0.12	0.14	0.13	0.02	0.01	1.05	1.11	2.80	3.04	0.31	0.26	1.75	1.93
				57.14%	59.54%	5.36%	3.95%					37.50%	36.51%			5.00%	4.19%	62.50%	63.49%
5	Tapin North	3.04	3.04	0.95	1.02	0.00	0.00	0.12	0.12	0.00	0.00	0.74	0.75	1.69	1.77	0.12	0.12	0.95	1.02
				56.21%	57.63%	0.00%	0.00%					43.79%	42.37%			3.95%	3.95%	56.21%	57.63%
6	Konar Exp.	4.71	4.71	0.95	1.00	0.35	0.34	0.03	0.03	0.03	0.03	0.70	0.68	2.00	2.02	0.41	0.40	1.30	1.34
				47.50%	49.50%	17.50%	16.83%					35.00%	33.66%			8.70%	8.49%	65.00%	66.34%
	TOTAL	44.80	44.80	7.16	7.81	1.91	1.78	0.44	0.36	0.22	0.17	5.58	6.10	14.65	15.69	2.57	2.31	9.07	9.59
				48.87%	49.78%	13.04%	11.34%					38.09%	38.88%			5.74%	5.16%	61.91%	61.12%

(% is calculated with respected to Excavated Area as applicable)

Note: In reference of the above Table-1, different parameters are classified as follows:

- 1 Leasehold area as per the EC boundary
- 2 Area under **Biological Reclamation** includes Area under Plantation done on Backfilled area only
- 3 Area under **Technical Reclamation** includes Area under Backfilling only
- 4 Area under **Active Mining** includes Coal Quarry, Quarry filled with water & Advance Quarry Site, if any. Coal dump is excluded
- 5 Social Forestry and Plantation on External OB dumps are not included in Biological Reclamation, and are put under separate categories
- 6 (%) calculated in the above table is in respect of total excavated area except for "**Total area under Plantation**" where % is in terms of Leasehold Area.

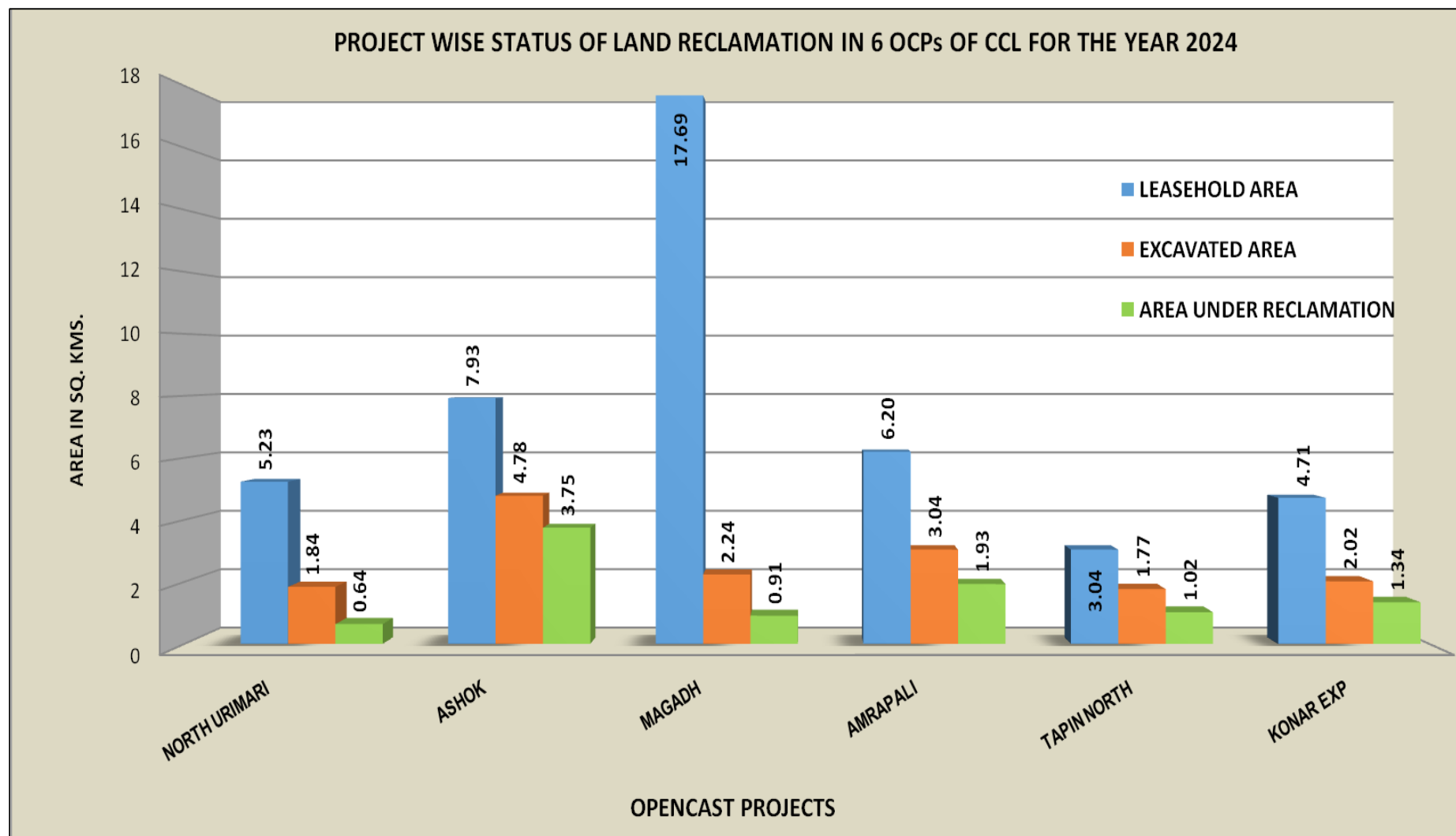


Chart 9.1: Bar Chart showing Land Reclamation Status in CCL

Table 9.2: Project-wise Land Reclamation Status in Opencast Projects of CCL (2024)

															(Area in Sq. Km)	
			NORTH URIMARI		ASHOK		MAGADH		AMRAPALI		TAPIN NORTH		KONAR EXP		TOTAL	
FORESTS			Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
	Dense Forest		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Open Forest		0.00	0.00	0.51	6.43	2.50	14.15	0.08	1.29	0.30	9.87	0.48	10.19	3.87	8.64
	Total Forest (A)		0.00	0.00	0.51	6.43	2.50	14.15	0.08	1.29	0.30	9.87	0.48	10.19	3.87	8.64
	Scrubs(B)		0.77	14.72	1.03	12.99	2.57	14.54	0.50	8.06	0.39	12.83	0.77	16.35	6.03	13.46
PLANTATION	Social Forestry		0.00	0.00	0.11	1.39	0.02	0.11	0.01	0.16	0.00	0.00	0.03	0.64	0.17	0.38
	Plantation on OB Dump		0.04	0.76	0.00	0.00	0.04	0.23	0.13	2.10	0.12	3.95	0.03	0.64	0.36	0.80
	Plantation on Backfill (Biological Reclamation)		0.09	1.72	1.23	15.51	0.00	0.00	0.12	1.94	0.00	0.00	0.34	7.22	1.78	3.97
	Total Plantation(C)		0.13	2.49	1.34	16.90	0.06	0.34	0.26	4.19	0.12	3.95	0.40	8.49	2.31	5.16
Total Vegetation(A+B+C)			0.90	17.21	2.88	36.32	5.13	29.03	0.84	13.55	0.81	26.64	1.65	35.03	12.21	27.25
ACTIVE MINING	Coal Quarry		1.14	21.80	0.83	10.47	1.15	6.51	1.00	16.13	0.62	20.39	0.56	11.89	5.30	11.83
	Advance Quarry Site		0.06	1.15	0.08	1.01	0.00	0.00	0.10	1.61	0.05	1.64	0.11	2.34	0.40	0.89
	Quarry Filled With Water		0.00	0.00	0.12	1.51	0.18	1.02	0.01	0.16	0.08	2.63	0.01	0.21	0.40	0.89
	Total Area under Active Mining(D)		1.20	22.94	1.03	12.99	1.33	7.53	1.11	17.90	0.75	24.67	0.68	14.44	6.10	13.62
(E)	Coal Dump		0.03	0.57	0.00	0.00	0.35	1.98	0.03	0.48	0.08	2.63	0.06	1.27	0.55	1.23
	Barren OB Dump		1.30	24.86	0.00	0.00	1.04	5.89	0.66	10.65	0.01	0.33	0.42	8.92	3.43	7.66
	Area Under Backfilling (Technical Reclamation)		0.55	10.52	2.52	31.78	0.91	5.15	1.81	29.19	1.02	33.55	1.00	21.23	7.81	17.43
	Total Area under Mine Operation(D+E)		3.08	58.89	3.55	44.77	3.63	20.54	3.61	58.23	1.86	61.18	2.16	45.86	17.89	39.93
WASTELANDS	Waste Lands		0.67	12.81	0.38	4.79	2.67	15.11	0.92	14.84	0.31	10.20	0.52	11.04	5.47	12.21
	Fly Ash Pond / Sand Body		0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.32	0.00	0.00	0.00	0.00	0.02	0.04
	Total Wasteland		0.67	12.81	0.38	4.79	2.67	15.11	0.94	15.16	0.31	10.20	0.52	11.04	5.49	12.25
WATERBODY	Reservoir, Nallah, Ponds		0.02	0.38	0.07	0.88	0.23	1.30	0.04	0.65	0.01	0.33	0.00	0.00	0.37	0.83
	Total Waterbodies		0.02	0.38	0.07	0.88	0.23	1.30	0.04	0.65	0.01	0.33	0.00	0.00	0.37	0.83
AGRICULTURE	Crop Lands		0.00	0.00	0.06	0.76	0.35	1.98	0.08	1.29	0.00	0.00	0.00	0.00	0.49	1.09
	Fallow Lands		0.28	5.35	0.79	9.96	5.12	28.98	0.50	8.06	0.04	1.32	0.11	2.34	6.84	15.27
	Total Agriculture		0.28	5.35	0.85	10.72	5.47	30.96	0.58	9.35	0.04	1.32	0.11	2.34	7.33	16.36
SETTLEMENTS	Urban Settlement		0.00	0.00	0.00	0.00	0.01	0.06	0.00	0.00	0.00	0.00	0.15	3.18	0.16	0.36
	Rural Settlement		0.09	1.72	0.17	2.14	0.32	1.81	0.05	0.81	0.01	0.33	0.09	1.91	0.73	1.63
	Industrial Settlement		0.19	3.63	0.03	0.38	0.21	1.19	0.14	2.26	0.00	0.00	0.03	0.64	0.60	1.34
	Total Settlements		0.28	5.35	0.20	2.52	0.54	3.06	0.19	3.06	0.01	0.33	0.27	5.73	1.49	3.33
	Grand Total		5.23	100.00	7.93	100.00	17.67	100.00	6.20	100.00	3.04	100.00	4.71	100.00	44.80	100.00

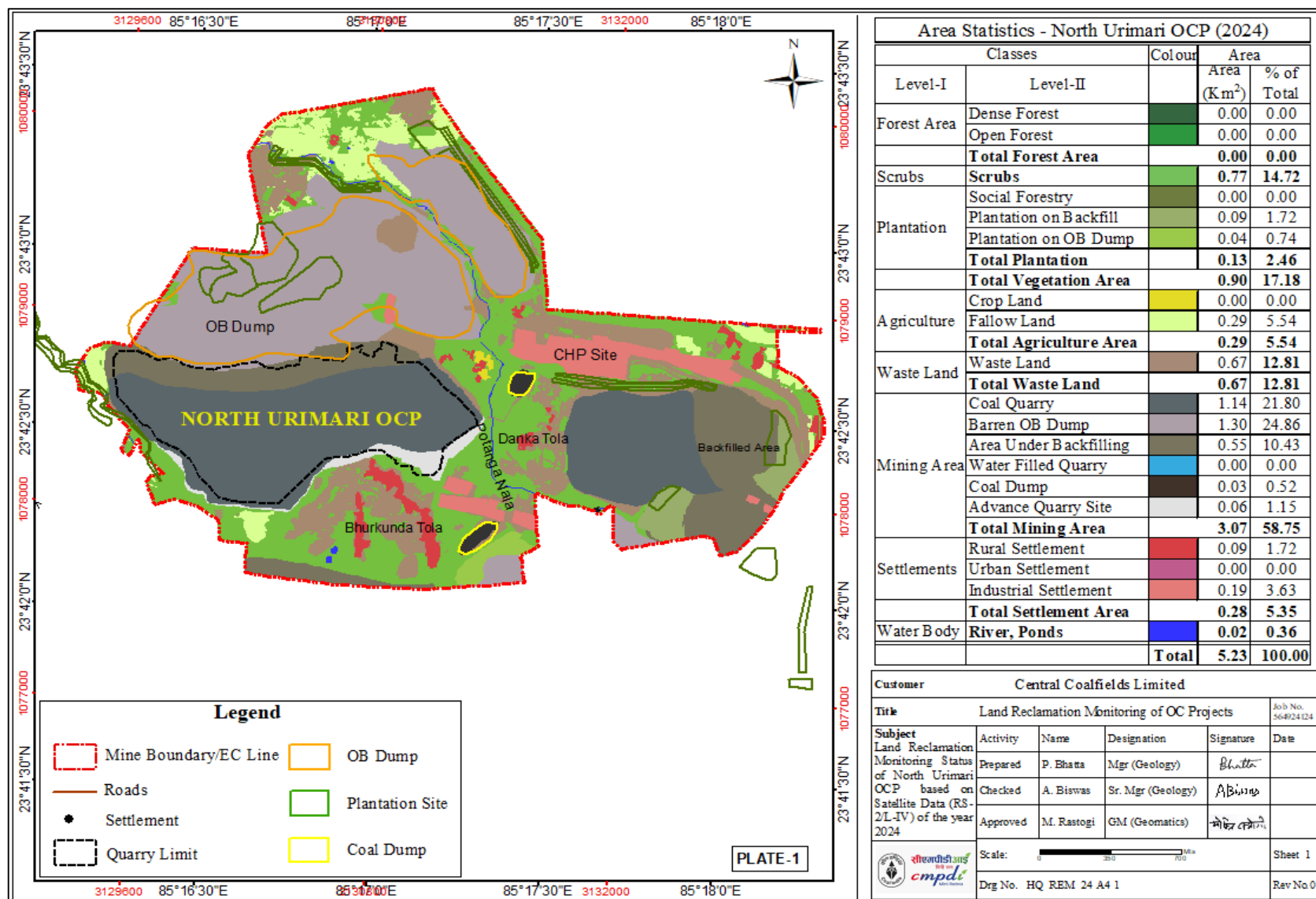


Plate 9-1: Land Use/Cover map of North Urimari OCP

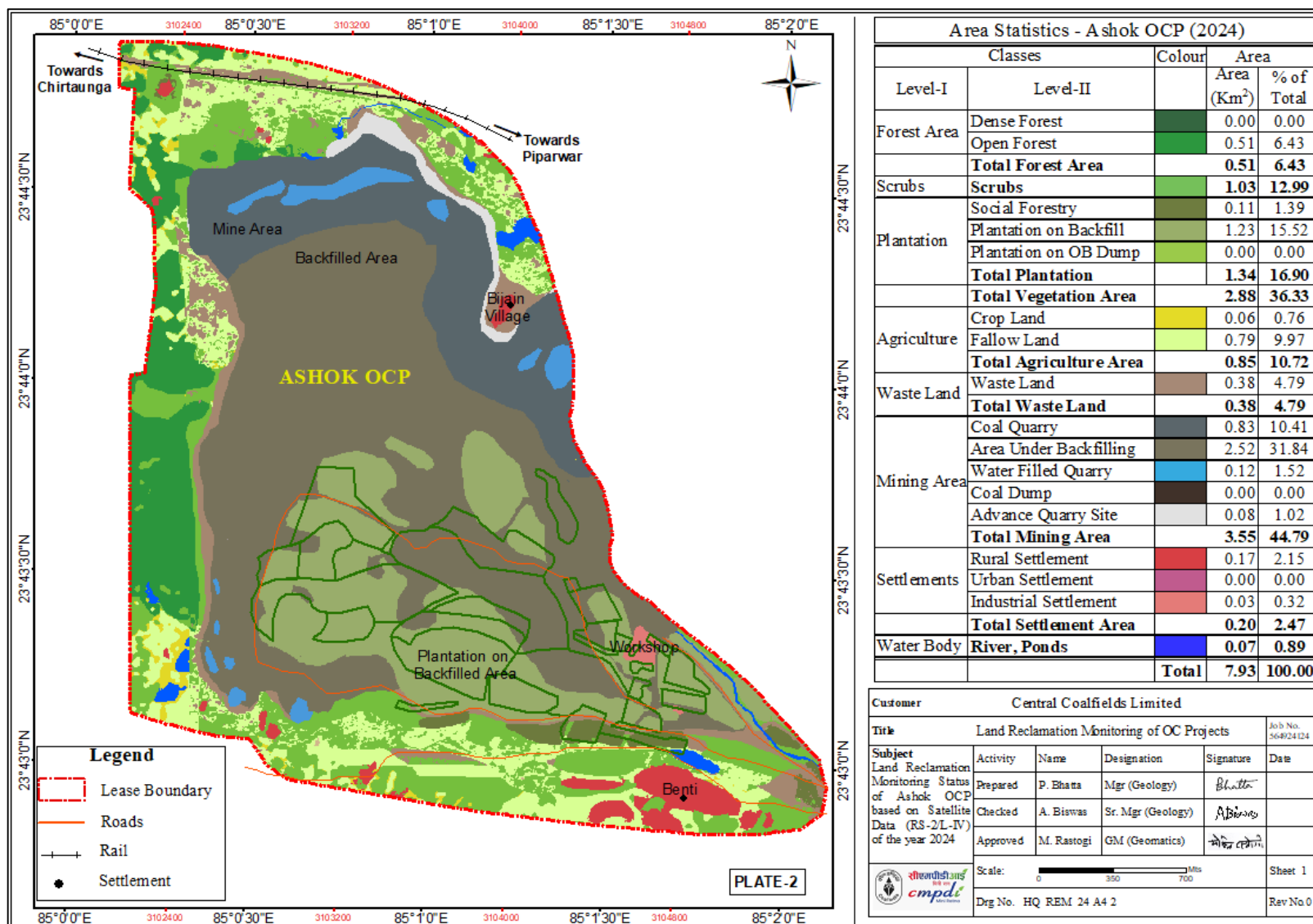


Plate 9-2: Land Use/Cover map of Ashok OCP

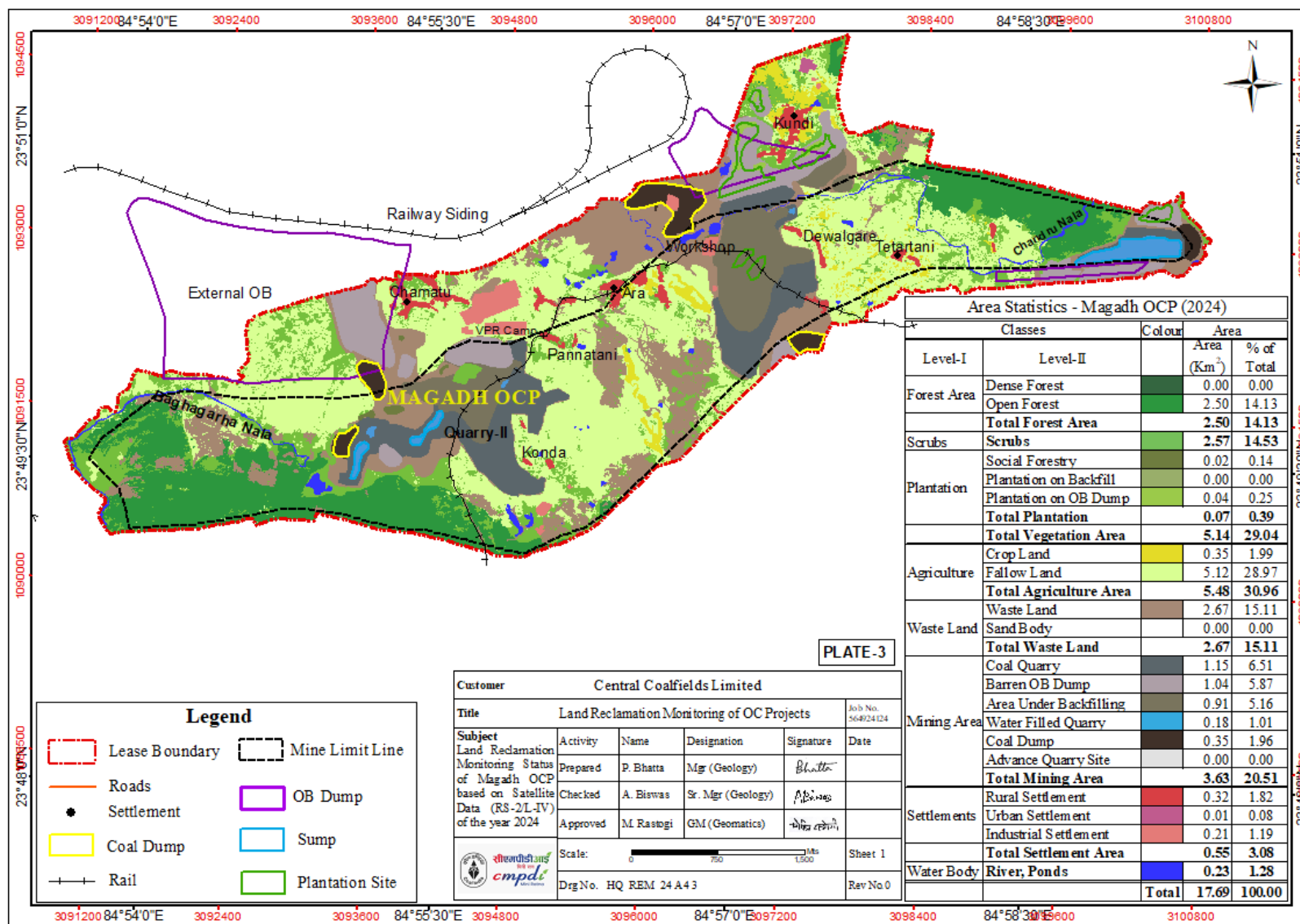


Plate 9-3: Land Use/Cover map of Magadh OCP

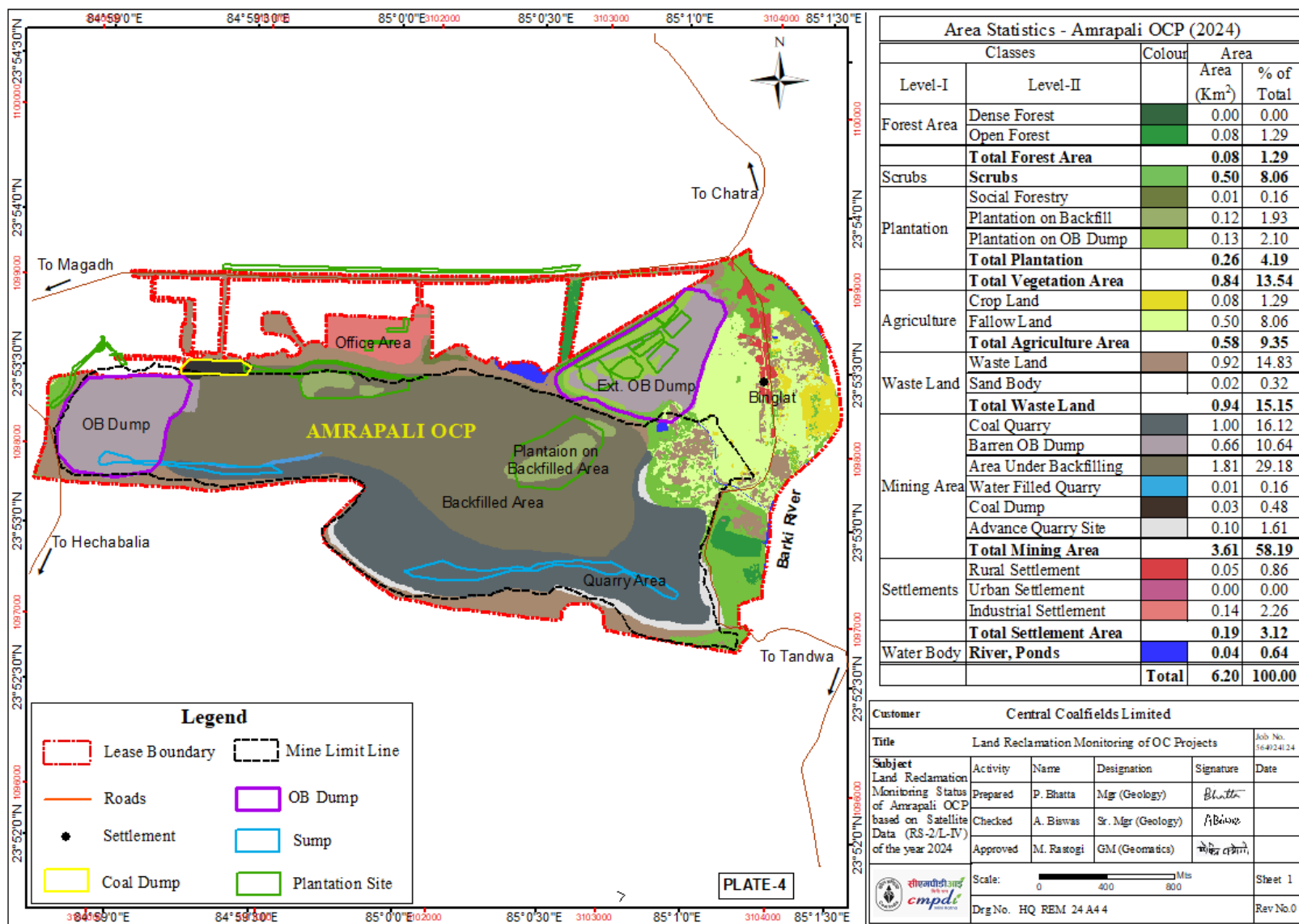


Plate 9-4: Land Use/Cover map of Amrapali OCP

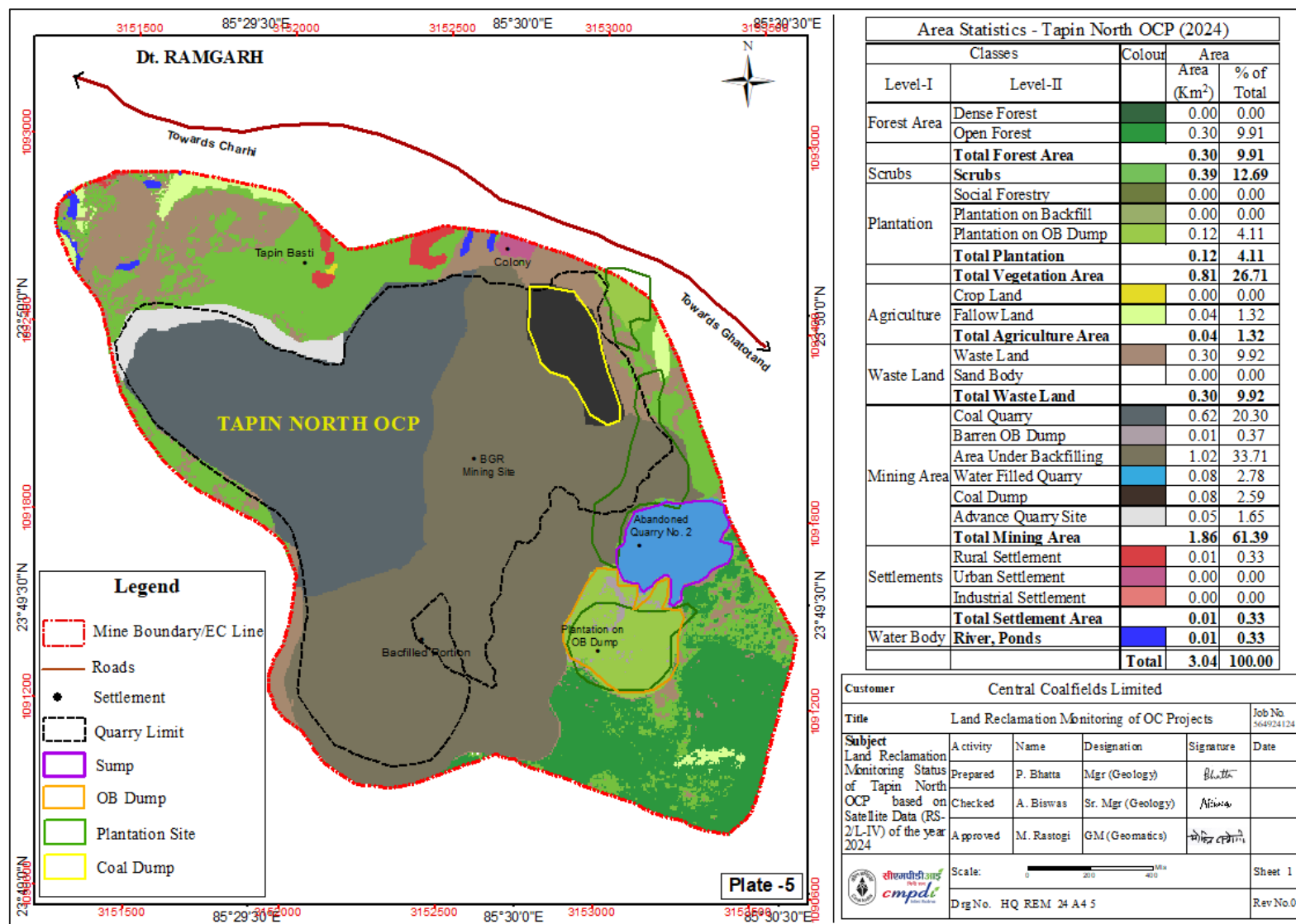


Plate 9-5: Land Use/Cover map of Tapin North OCP

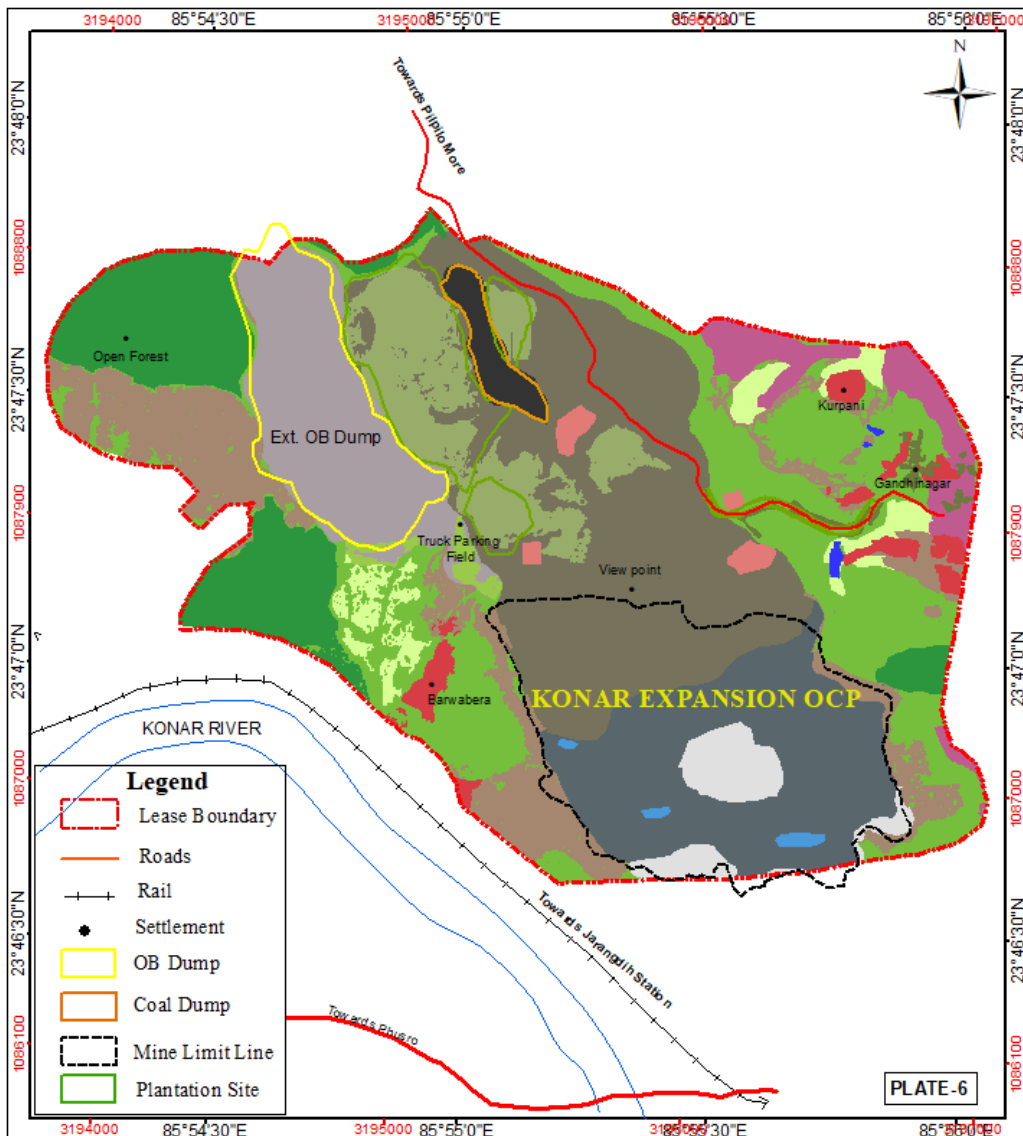


Plate 9-6: Land Use/Cover map of Konar Expn. OCP

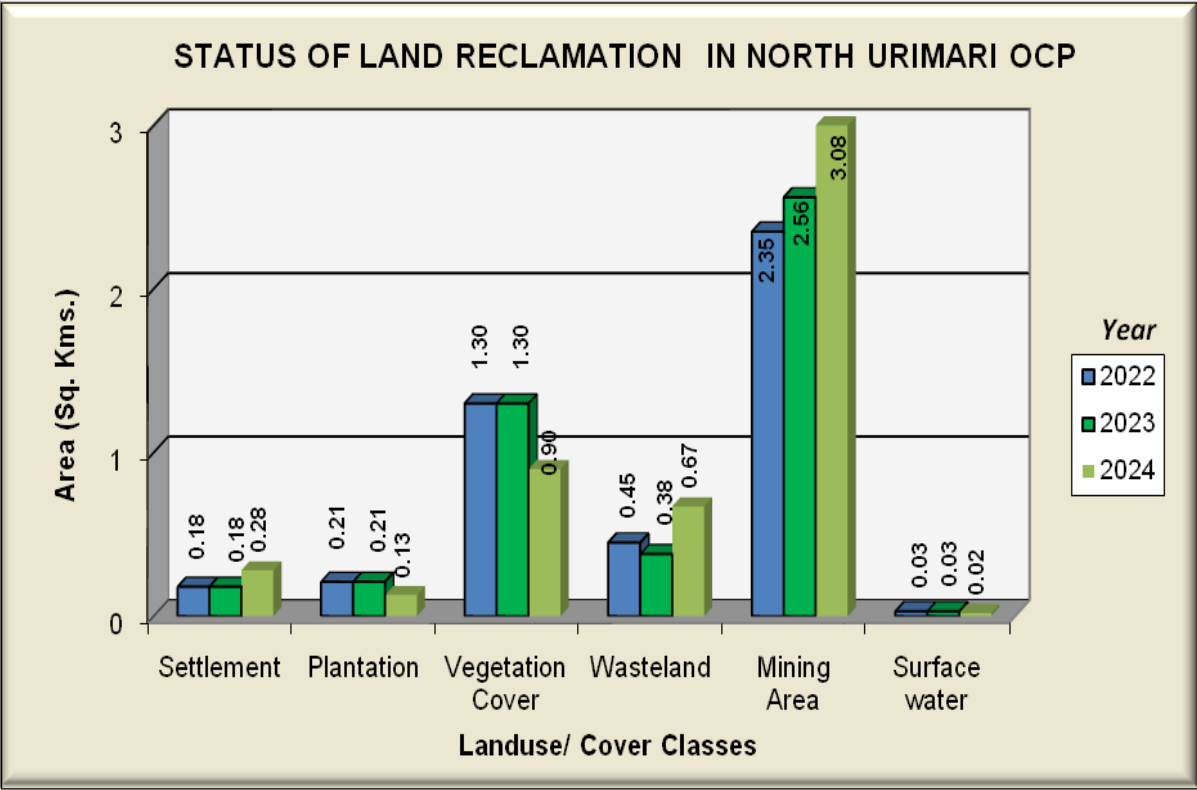


Chart 9.2: Status of Land Reclamation in North Urimari OCP

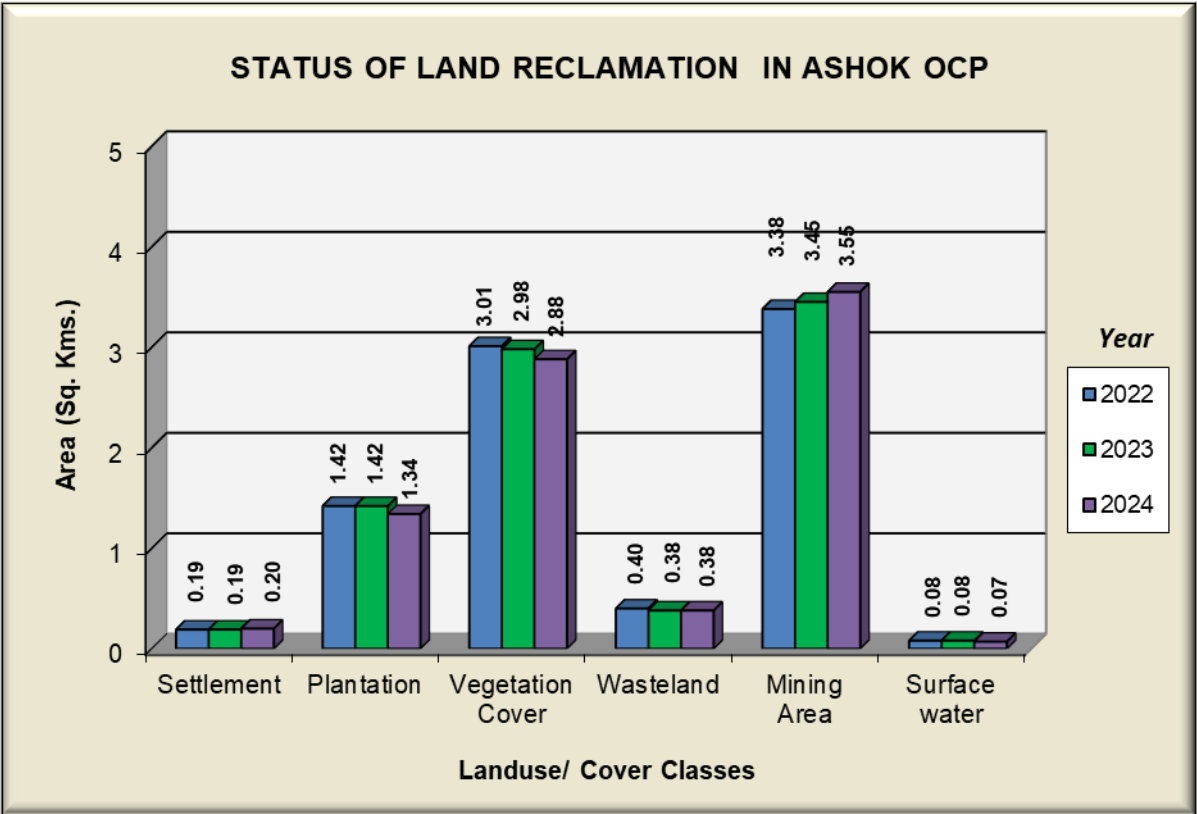


Chart 9.3: Status of Land Reclamation in Ashok OCP

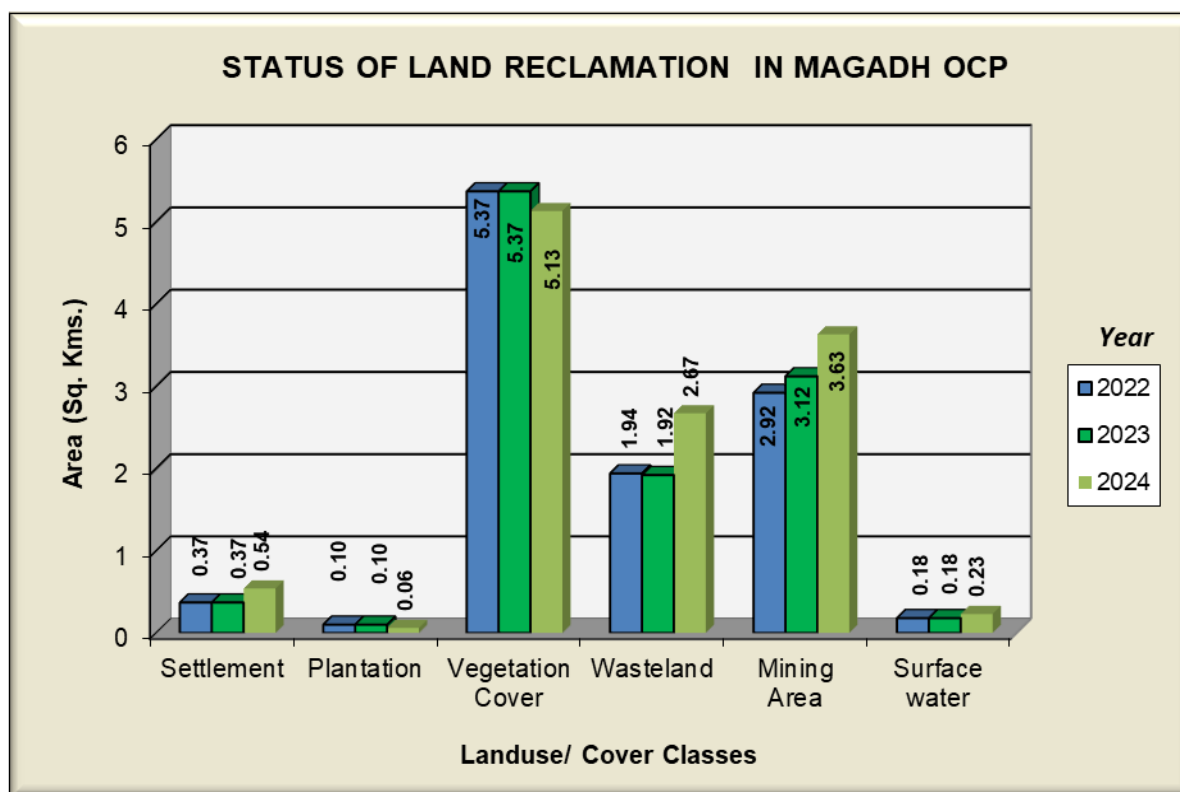


Chart 9.4: Status of Land Reclamation in Magadh OCP

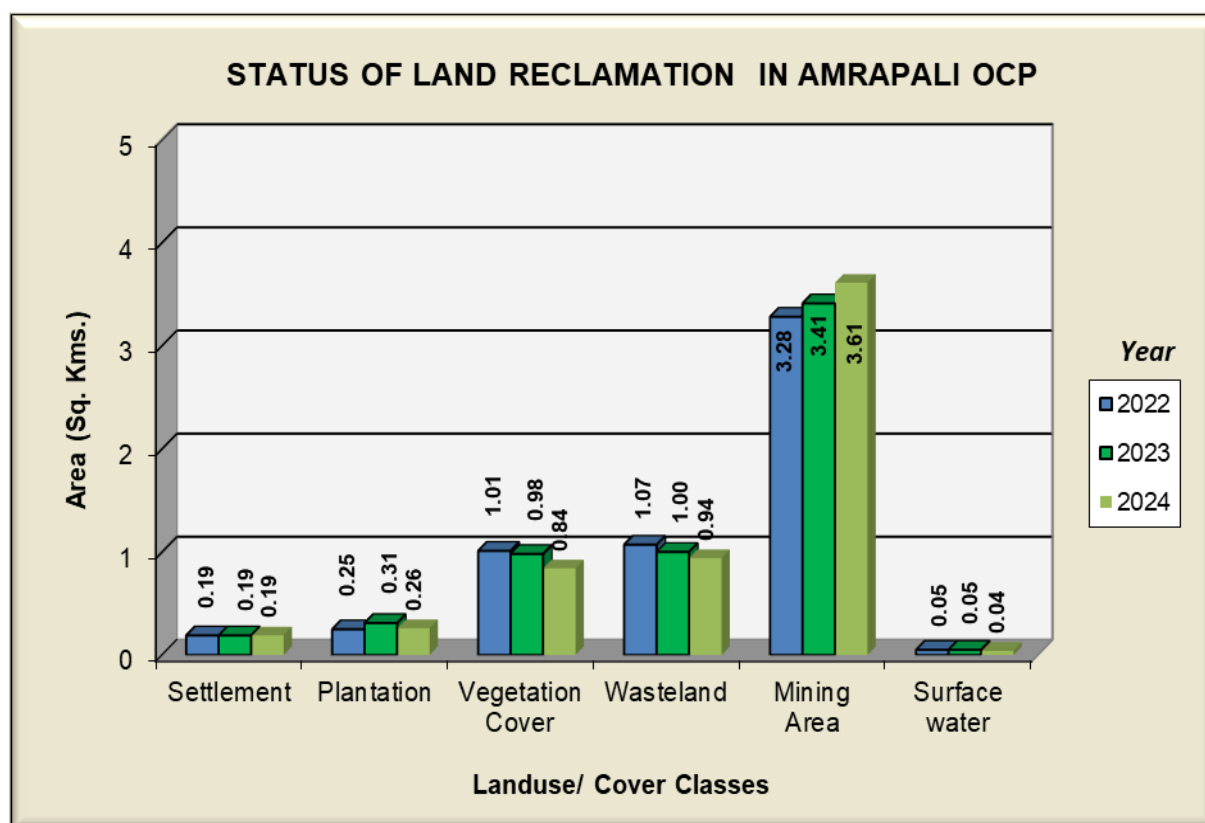


Chart 9.5: Status of Land Reclamation in Amrapali OCP

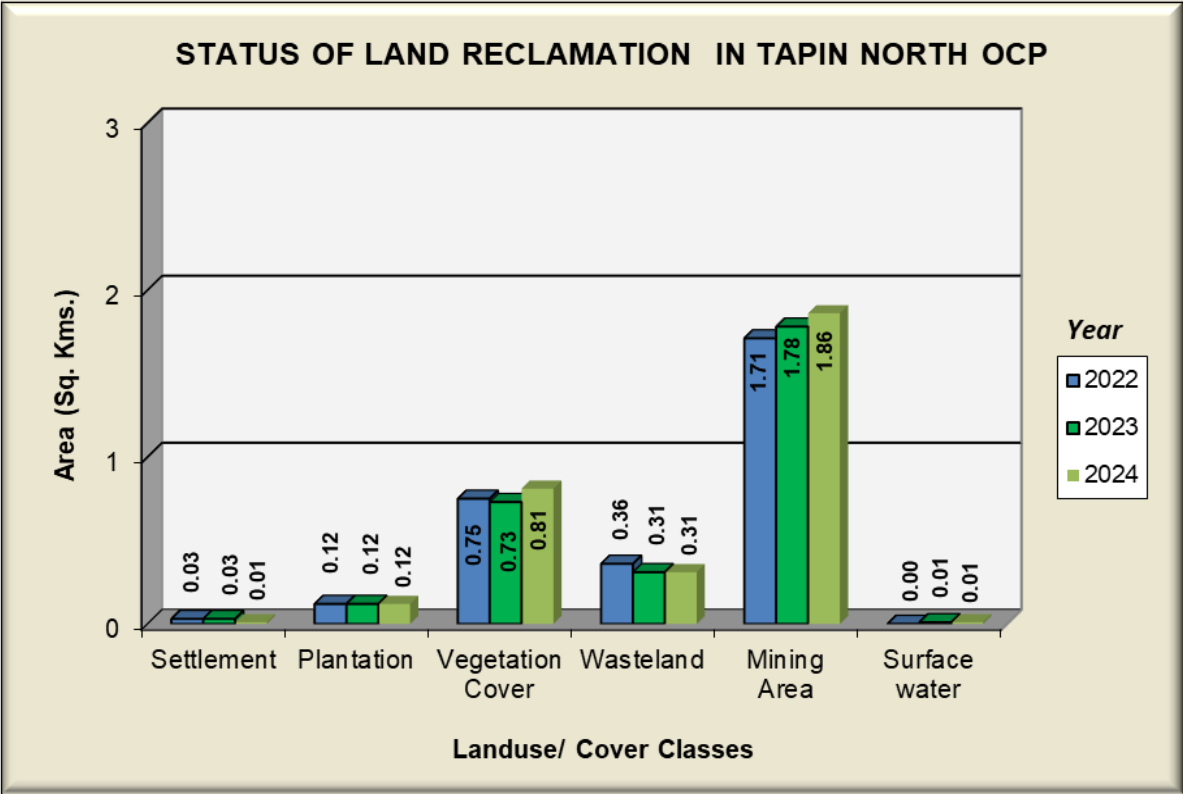


Chart 9.6: Status of Land Reclamation in Tapin North OCP

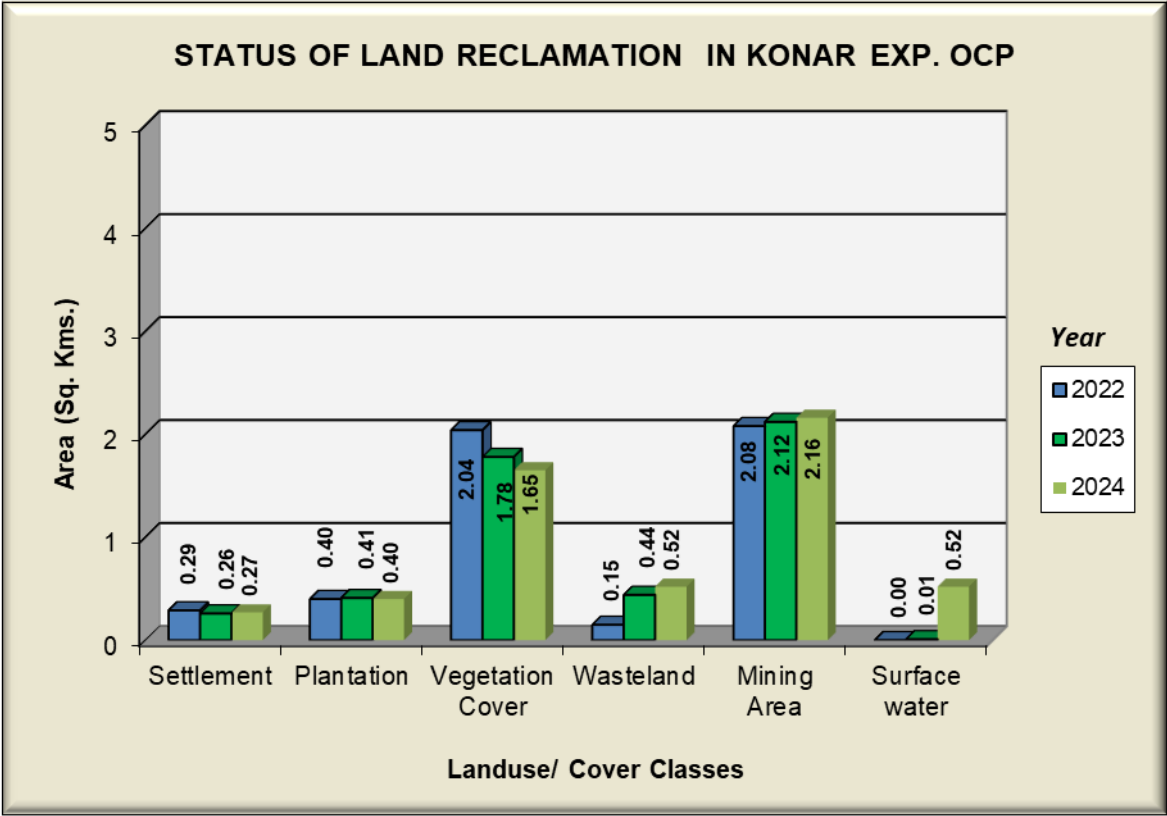


Chart 9.7: Status of Land Reclamation in Konar Expn. OCP



Photo 9.1: Plantation on OB Dump Area- North Urimari (Birsa) OCP

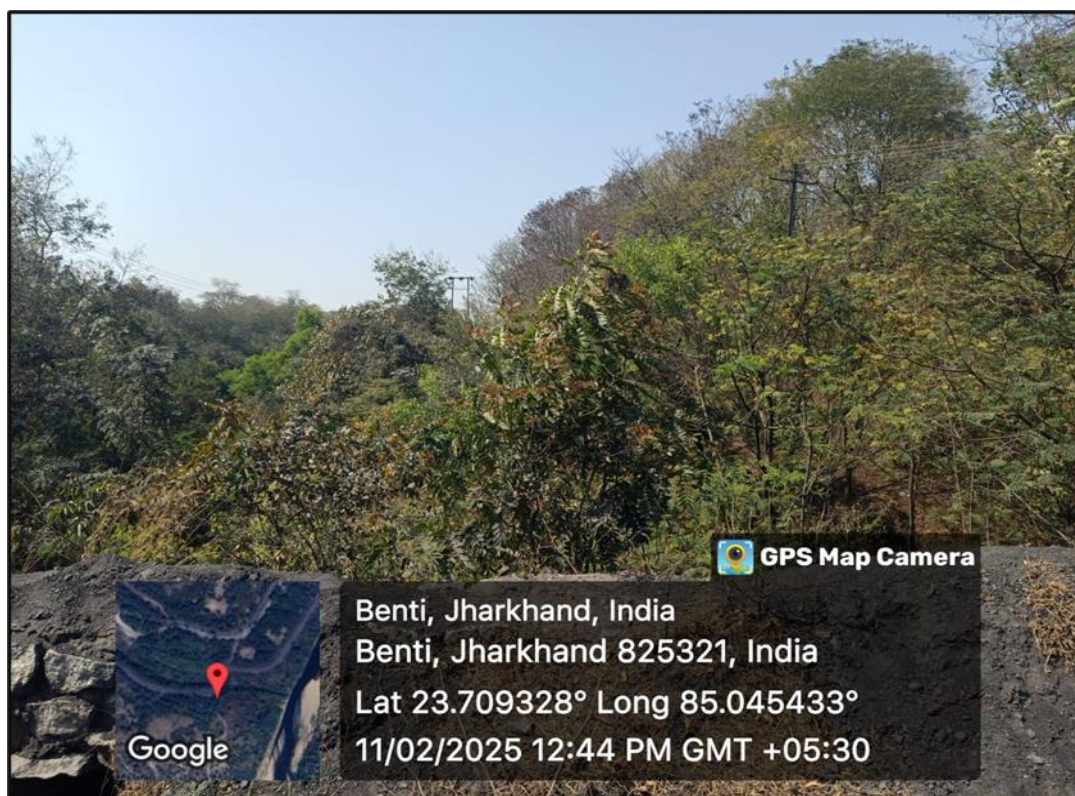


Photo 9.2: Plantation on Backfill Area- Ashok OCP



Photo 9.3: Plantation on External OB Dump Area- Magadh OCP



Photo 9.4: Plantation on OB Dump Area- Magadh OCP



Photo 9.5: Plantation on External OB Dump- Tapin North OCP

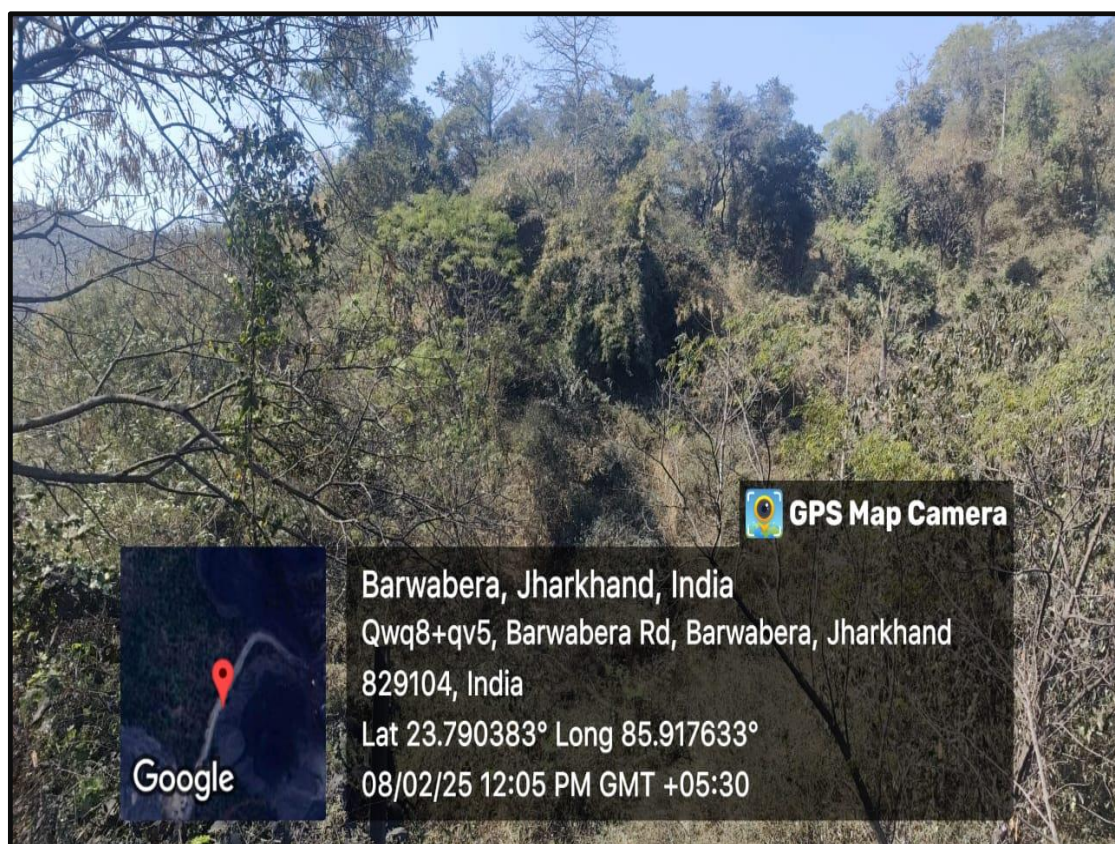


Photo 9.6: Plantation on External OB Dump- Konar Expansion OCP

EASTERN COALFIELDS LIMITED

10. Land Reclamation Status in Eastern Coalfields Ltd.

10.1 Following two OC projects producing 5 million cubic m. or more (Coal + OB) annually of Eastern Coalfields Ltd. have been taken up for land reclamation based on Satellite Data of the year 2024.

- **Rajmahal OCP**
- **Sonepur Bazari OCP**

10.2 Both the projects were monitored earlier during the period of 2023 also, on annual basis for assessing the progress of land reclamation.

10.3 Project wise Land Reclamation status in ECL for the year 2024 is given in Table-10.1 and shown graphically in Chart 10.1 Area statistics of different land classes present in OC projects for the year 2024 is given in Table 10.2. Land use/ cover maps derived using the satellite data are given in Plate no. 10.1 & 10.2. Changes in land use status are shown in Fig. 10.2 & 10.3.

10.4 Study based on Satellite data reveals that 15.07 km² (67.76%) of excavated area has come under reclamation in ECL, out of which 11.76 km² (52.88%) area is under backfilling (Technical Reclamation) and 3.31 km² (14.88%) area is under plantation (Biological Reclamation).

10.5 On comparing the status of land reclamation for the year 2024 with respect to the year 2023, it is seen from the analysis that the total area of land reclamation has increased from 13.44 km² (Yr. 2023) to 15.07 km² (Yr. 2024).

10.6 After analyzing the data of the year 2024, it is seen that the total area under plantation (Green Cover) which includes plantation carried out on backfilled area, OB dumps and plantation under social forestry/ avenue plantation in the leasehold area of two mines of ECL has increased from 5.67 km² (Yr. 2023) to 6.82 km² (Yr. 2024).

10.7 Of the two projects in ECL, Rajmahal OCP tops with 74.45% reclamation followed by Sonepur Bazari OCP with 61.88 % reclamation.

Table 10.1: Summarized Land Reclamation Status in ECL

Summarized Land Reclamation Status in Opencast Projects of ECL based on Satellite Data of the year 2024

(Projects producing more than 5 mcm of Coal + OB annually)

(Area in Sq. Kms.)

Sl. No.	Project	Total/ Mine Lease hold Area		Technical Reclamation		Plantation						Area under Active Mining		Total Excavated Area		Total Area under Plantation (% Green Cover Generated in Leasehold Area)		Total Area under Reclamation	
						Biological		Other Plantations											
				Area under Backfilling		Plantation on Excavated / Backfilled Area		Plantation on External Over Burden Dumps		Social Forestry, Awanue Plantation Etc.									
1	2	3		4		5		6		7		8		9 (=4+5+8)		10 (=5+6+7)		11(=4+5)	
		2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024	2023	2024
1	Rajmahal	17.75	17.75	5.28	5.35	2.08	2.40	0.15	0.24	0.62	1.06	1.25	2.66	8.61	10.41	2.85	3.70	7.36	7.75
				61.32%	51.39%	24.16%	23.05%					14.52%	25.55%			16.06%	20.85%	85.48%	74.45%
2	Sonepur Bazari	22.94	22.94	5.13	6.41	0.95	0.91	0.87	0.87	1.00	1.34	3.93	4.51	10.01	11.83	2.82	3.12	6.08	7.32
				51.25%	54.18%	9.49%	7.69%					39.26%	38.12%			12.29%	13.60%	60.74%	61.88%
	TOTAL	40.69	40.69	10.41	11.76	3.03	3.31	1.02	1.11	1.62	2.40	5.18	7.17	18.62	22.24	5.67	6.82	13.44	15.07
				55.91%	52.88%	16.27%	14.88%					27.82%	32.24%			13.93%	16.76%	72.18%	67.76%
(% is calculated with respected to Total Excavated Area as applicable)																			

(% is calculated with respected to Total Excavated Area as applicable)

Note: In reference to the above Table-1, different parameters are classified as follows:

1. Area under **Biological Reclamation** includes Area under Plantation done on Backfilled Area only.
2. Area under **Technical Reclamation** includes Area under Barren Backfilling only.
3. Area under **Active Mining** includes Coal Quarry, Advance Quarry Site, Quarry Filled with Water, if any. Coal Dump is excluded from Active Mining Area.
4. Social Forestry and Plantation on External OB Dumps are not included in Biological Reclamation and are put under separate categories as shown in the Table above.
5. (%) calculated in the above Table is in respect to Total Excavated Area except for "Total Area under Plantation" where % is in terms of "Leasehold Area".

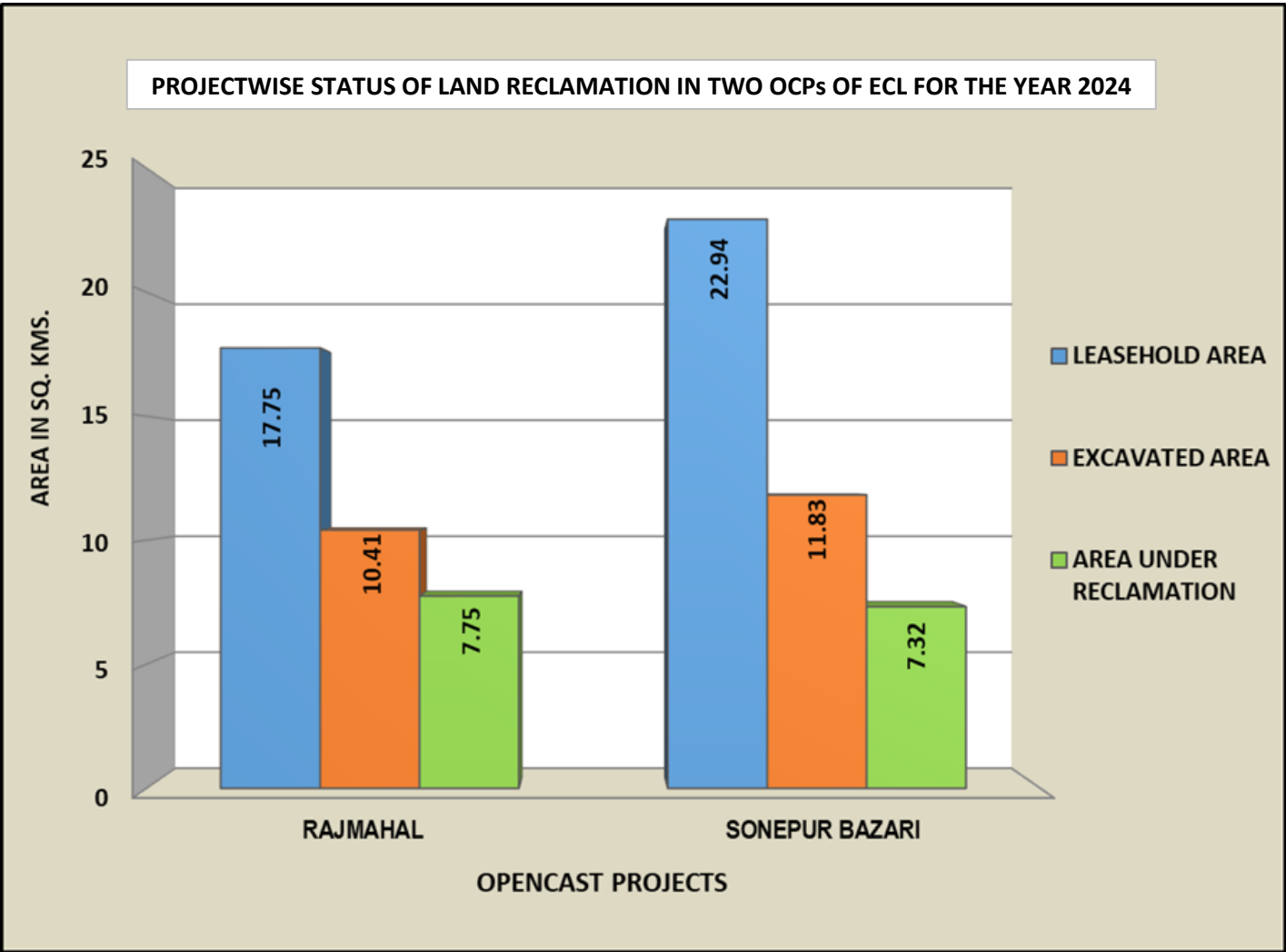


Chart 10.1: Bar Chart showing Land Reclamation Status in ECL

Table 10.2: Project-wise Land Reclamation Status in Opencast Projects of ECL (2024)

Project wise Area Statistics of Land Use/ Cover Classes in OC Mines (>5m.cu.m) of ECL based on Satellite data of the Year 2024								
(Area in Sq Km)								
FORESTS			RAJMAHAL		SONEPUR BAZARI		TOTAL	
			Area	%	Area	%	Area	%
			Dense Forest		0.00	0.00	0.00	0.00
	Open Forest		0.00	0.00	0.00	0.00	0.00	0.00
	Total Forest(A)		0.00	0.00	0.00	0.00	0.00	0.00
	Scrubs(B)		1.25	12.85	1.63	15.13	2.88	7.08
PLANTATION	Social Forestry		1.06	3.49	1.34	4.36	2.40	5.90
	Plantation on OB Dump		0.24	0.85	0.87	3.79	1.11	2.73
	Plantation on Backfill(Biological Reclamation)		2.40	11.72	0.91	3.97	3.31	8.13
	Total Plantation (C)		3.70	16.06	3.12	11.94	6.82	16.76
	Total Vegetation (A+B+C)		4.95	28.90	4.75	27.42	9.70	23.85
ACTIVE MINING	Coal Quarry		1.91	4.00	4.03	14.65	5.94	14.60
	Advance Quarry Site		0.28	1.46	0.19	1.92	0.47	1.14
	Quarry Filled With Water		0.47	1.58	0.29	1.26	0.76	1.87
	Area under Active Mining (D)		2.66	7.04	4.51	17.83	7.17	17.61
E	Coal Dump		0.03	0.17	0.06	0.28	0.09	0.23
	Barren OB Dump		0.04	0.90	2.62	11.55	2.66	6.55
	Area Under Backfilling(Technical Reclamation)		5.35	29.75	6.41	22.36	11.76	28.90
	Total Area under Mining Operation (D+E)		8.08	37.86	13.61	51.35	21.68	53.29
WASTELAND	Waste Lands		1.00	7.04	1.26	5.06	2.26	5.55
	Fly Ash Pond / Sand Body		0.00	0.00	0.00	0.00	0.00	0.00
	Total Wasteland		1.00	7.04	1.26	5.06	2.26	5.55
WATERBODIES	Reservoir, Nallah, Ponds		0.11	0.45	0.36	1.13	0.47	1.14
	Total Waterbodies		0.11	0.45	0.36	1.13	0.47	1.14
AGRICULTURE	Crop Lands		1.25	3.66	1.30	0.09	2.55	6.27
	Fallow Lands		1.02	13.97	0.70	10.68	1.72	4.23
	Total Agriculture Land		2.27	17.63	2.00	10.77	4.27	10.49
SETTLEMENTS	Urban Settlement		0.45	2.54	0.42	1.83	0.87	2.14
	Rural Settlement		0.66	4.28	0.21	0.92	0.87	2.14
	Industrial Settlement		0.23	1.30	0.34	1.48	0.57	1.40
	Total Settlement		1.34	8.11	0.97	4.27	2.31	5.68
	Grand Total		17.75	100.00	22.94	100.00	40.69	100.00

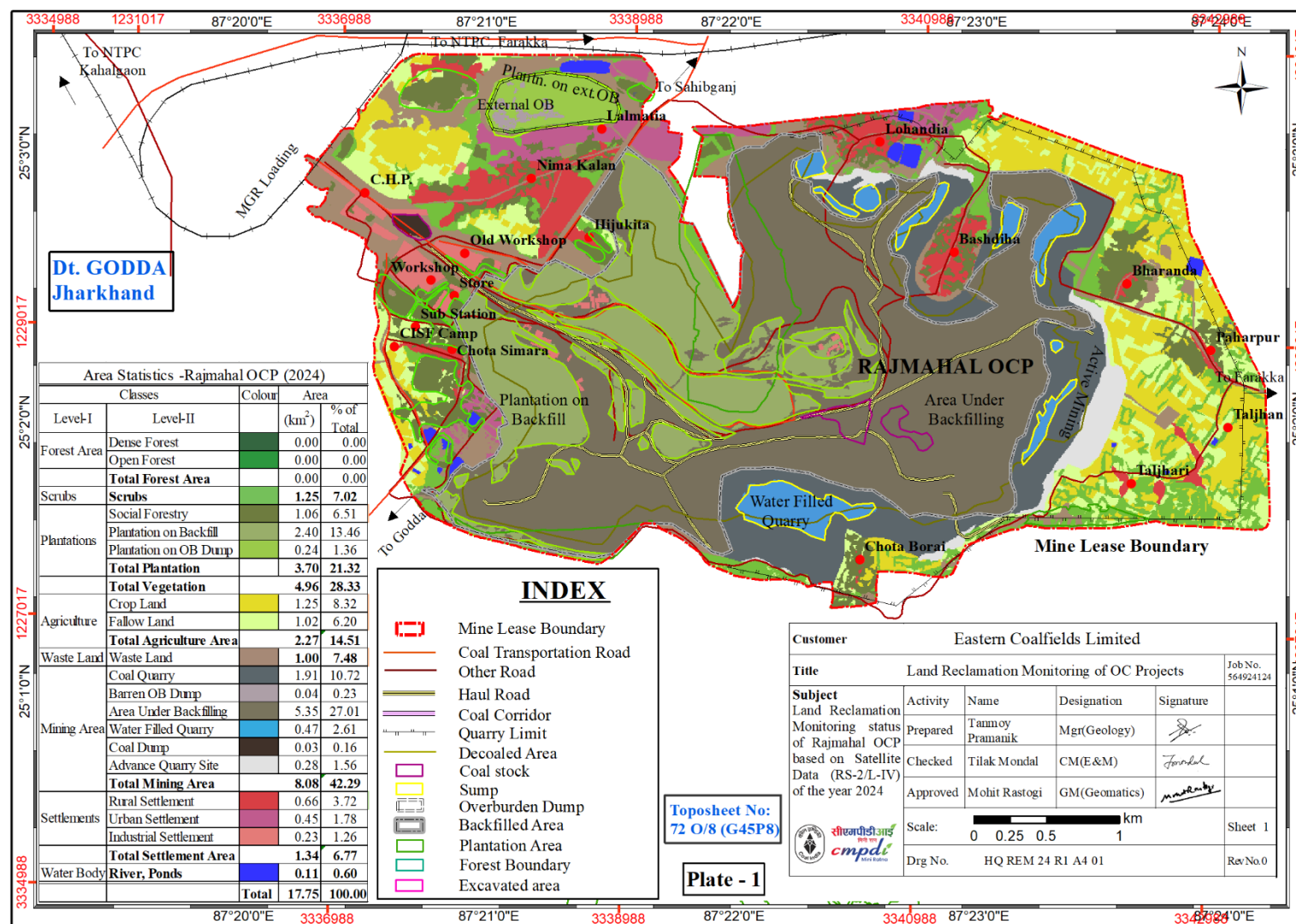


Plate 10-1: Land Use/Cover map of Rajmahal OCP

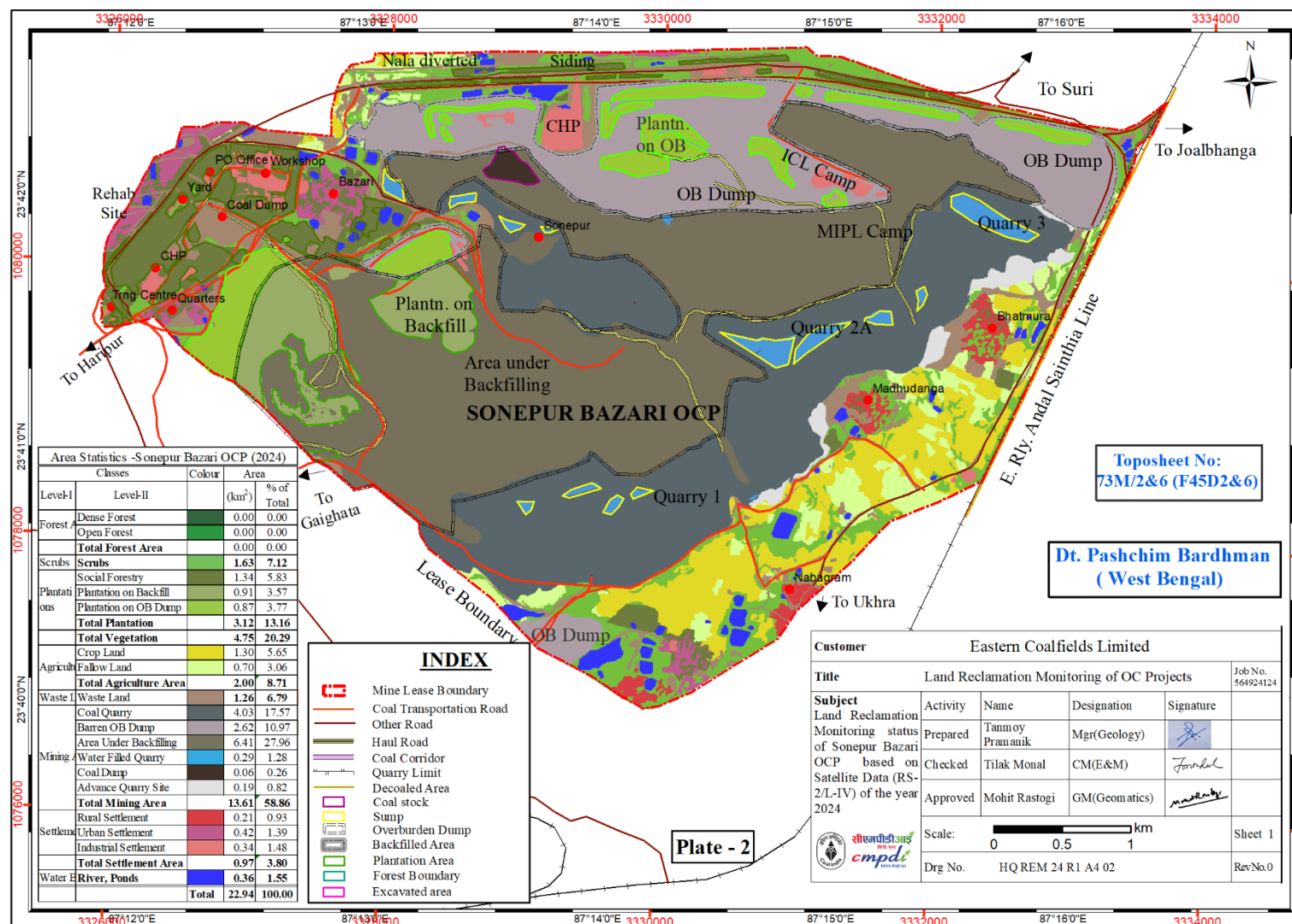


Plate 10-2: Land Use/Cover map of Sonepur Bazari. OCP

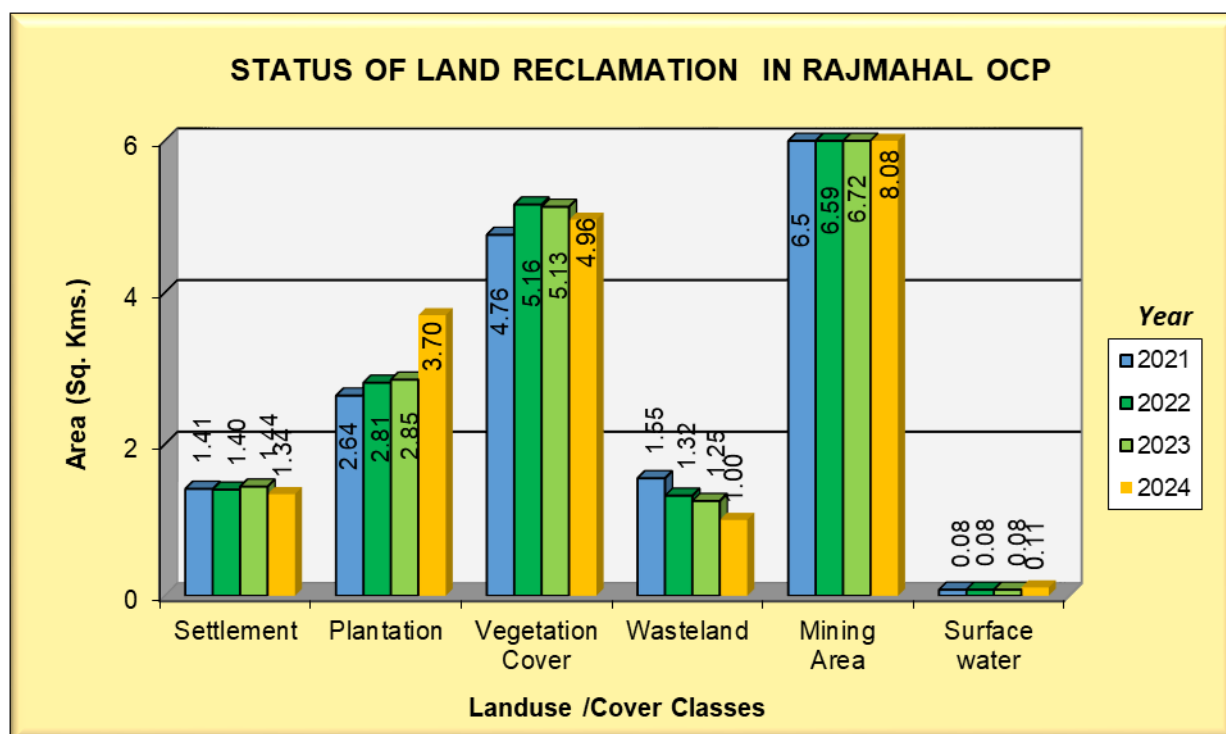


Chart 10.2: Status of Land Reclamation in Rajmahal OCP

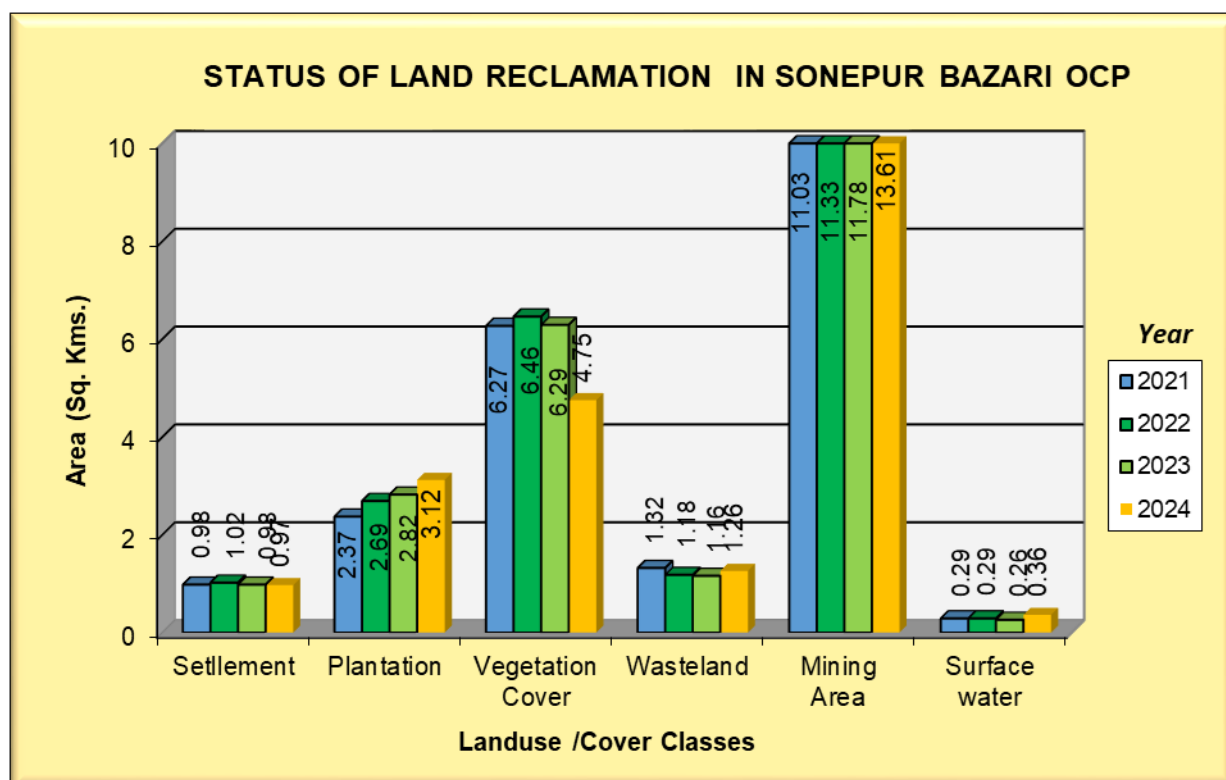


Chart 10.3: Status of Land Reclamation in Sonepur Bazari OCP

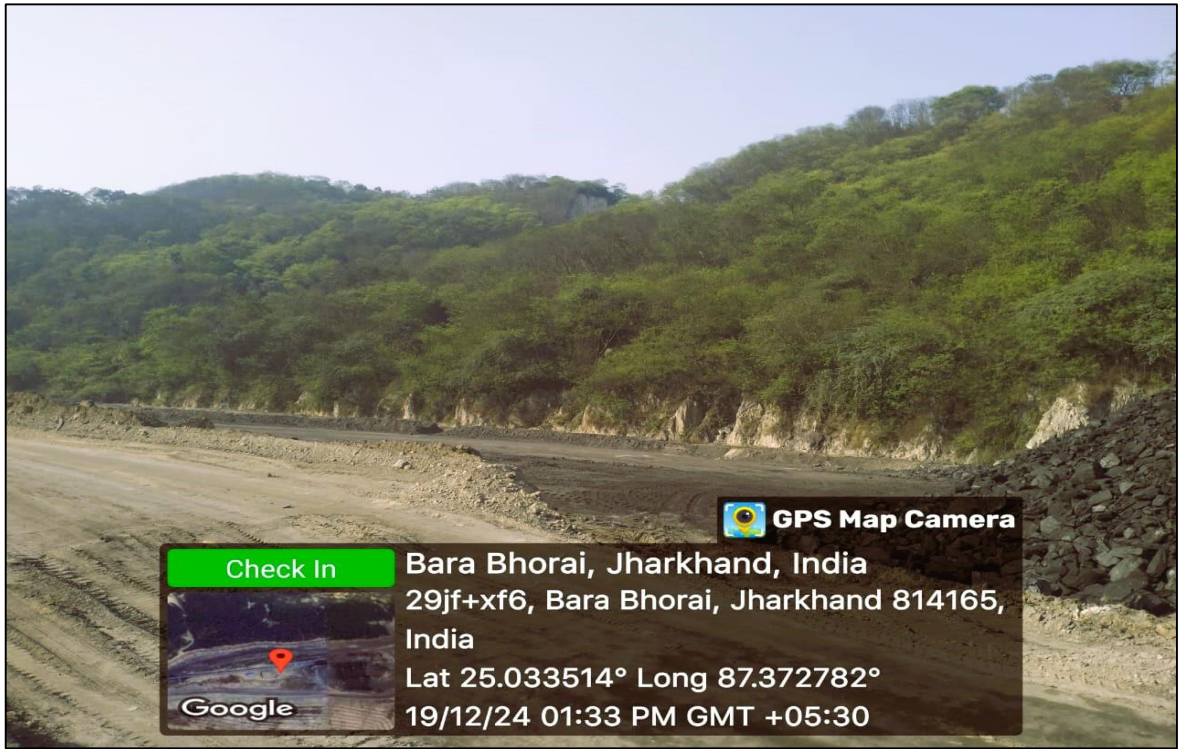


Photo 10.1: Plantation on Backfilled area in Rajmahal OCP, ECL



Photo 10.2: Plantation on External OB in Sonapur Bazari OCP, ECL

शब्द-कोष		
1	Land Reclamation	भूमि पुनरुद्धार
2	Over Burden	अधिभार
3	Monitoring	निगरानी
4	Report	प्रतिवेदन
5	Executive Summary	कार्यकारी सारांश
6	Opencast Mine	खुली खदान
7	Objective	उद्देश्य
8	Methodology	कार्य प्रणाली अथवा प्रक्रिया
9	Table	तालिका
10	List of Tables	तालिकाओं की सूची
11	Map	मानचित्र
12	Social Forestry	सामाजिक वानिकी
13	Plantation	पौधारोपण
14	Million	घनमीटर
15	Background	पृष्ठभूमि
16	Planning	योजनाबद्ध
17	Asses	आकलन
18	Status	स्थिति
19	Regularly	निरंतर
20	Satellite	उपग्रह
21	Subsidiary	अनुषांगिक
22	Production	उत्पादन
23	Biological Reclamation	जैविक पुनरुद्धार
24	Technical Reclamation	तकनीकी पुनरुद्धार
25	Leasehold Area	पट्टा क्षेत्र

26	Excavated Area	उत्खनन क्षेत्र
27	Active mining	सक्रिय खनन
28	Environmental Protection	पर्यावरण संरक्षण
29	Remedial Measure	उपचारात्मक उपाय
30	Interval	अंतराल
31	Systematic Error	व्यवस्थित त्रुटियाँ।
32	Error	अशुद्धियाँ
33	Curvature	वक्रता
34	Geometric	ज्यामितिक
35	Distortion	विरूपण
36	Plantation	पौधारोपण
37	Capacity	क्षमता
38	Software	सॉफ्टवेयर
39	Class	वर्ग
40	Accuracy	सटीकता
41	Statistical Separation	सांख्यिकीय पृथक्करण
42	Cubic meter	घनमीटर
43	Depicted	दर्शाया गया
44	Percentage	प्रतिशत
45	Salient Findings	मुख्य निष्कर्ष
46	Methodology	पद्धति
47	Data Procurement	डाटा क्रय
48	Satellite data Processing	उपग्रह डेटा प्रसंस्करण
49	Rectification and geo-referencing	सुधार और भू-सन्दर्भ
50	Image enhancement	छवि- गुण बृद्धि
51	Training set selection	प्रशिक्षण सेट का चयन

52	Classification and Accuracy assessment	वर्गीकरण और मूल्यांकन की सटीकता
53	Area calculation	क्षेत्र ना-गण
54	Temporal	लौकिक
55	Processing	प्रसंस्करण
56	Overlay of Vector data base	वेक्टर डेटा बेस का अरोपन
57	Area calculation	क्षेत्र-गणना
58	Pre-field map preparation	क्षेत्र जाने के पहले नक्शे की तैयारी
59	Ground Truthing	भू-सत्यापन
60	Ground Information	भू-सूचना
61	Interpretation	व्याख्या
62	Eco-system	पारिस्थितिकी तंत्र
63	Minor	मामुली
64	Water Drainage	जल निकाय
65	Interval	अंतराल
66	Maximum	अधिकतम
67	Coal field	कोयला क्षेत्र
68	Design	परिकल्पना
69	Superimpose	आरोपित
70	Update	अद्यतनीकरण/नवीनीकरण
71	Cumulative	संचयित
72	Embankment	तटबंध
73	Cluster	खुली तथा भूमिगत खदानों के समूह

ABBREVIATIONS

Sol	Survey of India
MoEF & CC	Ministry of Environment, Forest & Climate Change
CIL	Coal India Limited
ECL	Eastern Coalfields Limited
BCCL	Bharat Coking Coal Limited
CCL	Central Coalfields Limited
WCL	Western Coalfields Limited
SECL	South Eastern Coalfields Limited
NCL	Northern Coalfields Limited
MCL	Mahanadi Coalfields Limited
NEC	North Eastern Coalfields
CMPDIL	Central Mine Planning & Design Institute Ltd
NRSC	National Remote Sensing Centre
R2/ R2A	ResourceSat Satellite
LISS - 4	Linear Imaging and Self Scanning Sensor
FCC	False Colour Composite
OCP	Opencast Project
UGP	Underground Project
OB	Over Burden
GCP	Ground Control points
GIS	Geographic Information System
WGS-84	World Geodetic System
UTM	Universal Transverse Mercator

GLOSSARY

Sl.	Term	Definition
1.	Land Reclamation	To manage, reclaim and restore mined out/ degraded land as close as possible to its original stage.
2.	Over Burden	The material that lies above the coal seam/ deposit
3.	Monitoring	A process of evaluation to check or keep record for a period of time.
4.	Opencast Coal Mine	Open-pit mining, also known as opencast mining, is a surface mining technique that extracts minerals from an open pit in the ground.
5.	Social Forestry	Social forestry is the management and protection of forests and afforestation of barren and deforested lands with the purpose of helping environmental, social and rural development. Plantation (Social/ Avenue or other) carried out outside mining area.
6.	Biological Reclamation	Plantation on Backfilled areas (Stabilised Internal Dumps)
7.	Technical Reclamation	Area under backfilling (Over burden dumped inside the mine voids) in mining area.
8.	Green Cover Generated	Total Plantation carried out in the lease area of Project. This includes Plantation on Backfill, Plantation on OB and Social Forestry.
9.	Leasehold Area	The area, for which lease is granted for the purpose of undertaking mining and allied operations.
10.	Excavated area	Mined out area which includes active mining, area under backfilling and plantation on backfilled areas
11.	Active Mining	Mining areas which include Coal Quarry, Advance Quarry, Quarry Filled with Water etc.
12.	Environmental Protection	It is the practice of protecting the natural environment by individuals, organizations and governments. Its objectives are to conserve natural resources and the existing natural environment and, where possible, to mitigate damage and reverse trends.
13.	Remedial Measure	Any measure or action required or undertaken to investigate, monitor, clean up, remove, treat, prevent, contain or otherwise remediate the presence or release of any hazardous substance or activity.
14.	Systematic Error	Every measurement differing from the true measurement in the same direction, and even by the same amount in some cases.

15.	Geometric Distortion	It refers to the improper positioning of any image with respect to their true geographic position when viewed in a properly scaled common image display plane.
16.	Land Use/ Cover Class	Land cover is what covers the surface of the earth and land use describes how the land is used.
17.	Accuracy	The closeness of agreement between a measured quantity value and a true quantity value.
18.	Environmental Clearance	Environmental Clearance (EC) for any developmental projects like coal mining projects etc. has been made mandatory by the Ministry of Environment, Forests and Climate Change (MoEF & CC) through its Notification issued on 27.01.1994 under the provisions of Environment (Protection) Act, 1986.
19.	Rectification and Geo-referencing	Geo-referencing is the assigning of absolute location of a data point or data points. Geo-rectification refers to the removal of geometric distortions between sets of data points, most often the removal of terrain, platform, and sensor induced distortions from remote sensing imagery.
20.	Image Enhancement	It is the process of modifying digital images so that the results are more suitable for processing or further image analysis.
21.	Training set selection	It is a portion of a data set used to fit or train a model for prediction or classification of values that are known in the training set, but unknown in other (future) data.
22.	Image Classification	It refers to the task of extracting information classes from a multiband raster image. The resulting raster from image classification can be used to create thematic maps.
23.	Temporal Changes	The 'temporal change' means the change in any entity with a period of time.
24.	Ground Truthing	Collection of primary/ basic information from ground realities for satellite image interpretation and thematic mapping.
25.	Cluster	Group of opencast and/ or underground mines clubbed together for administrative purposes.
26.	Arc GIS	GIS Software used for Map preparation
27.	ERDAS IMAGINE	Satellite Image Data Classification Software



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