Annexure - 5

Chronology of status of validity of Mining lease:

The Coking Coal Mines (Nationalization) Act, 1972 dated 17th August 1972: The right, title & interest of the owners in relation to the coking coal mines specified in the First Schedule shall stand transferred to, and shall vest absolutely in, the Central Government, free from all in cumbrances.

⇩

The Coal India (Regulation of transfers & Validation) Act 2000 dated 8th December 2000: A subsidiary company which was operating, or was in control of, any coal mine, coking coal mine, or coke oven plant which was vested in the Coal India or any other subsidiary company immediately before the commencement of this Act, shall be deemed to have been vested with the land or rights in or over such land or the right, title and interest in relation to such coal mine, coking coal mine or coke oven plant and such vesting shall be deemed to have been valid and effective at all material times as if a direction had been made by the Central Government under sub-section (1) of section 3 and accordingly no suit or other proceeding shall be instituted, maintained or continued in any court on the ground that such subsidiary company was not competent to operate or control such coal mine, coking coal mine or coke oven plant

⇩

Mineral Concession (Amendment) Rules, 2021 dated 1st October 2021: All subsisting mining leases vested or granted to Government Company or corporation before commencement of Mineral Concession (Amendment) Rules 2021 for Coal or lignite shall be deemed to have been granted for fifty years or till 31st March 2030, whichever is later

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रजिस्ट्री सं० डी० 221 REGISTERED NO. D. 221

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इस भाग में भिन्न पृष्ठ संख्या दी जाती है जिससे कि यह अलग संकलन के रूप में रखा जा सके।
Separate paging is given to this Part in order that it may be filed as a separate compilation

MINISTRY OF LAW AND JUSTICE
(Legislative Department)

New Delhi, the 17th August 1972/Sravana 26, 1894 (Saka)

The following Act of Parliament received the assent of the President on the 17th August, 1972, and is hereby published for general information:—

THE COKING COAL MINES (NATIONALISATION) ACT, 1972

No. 36 OF 1972

[*17th August*, 1972.]

An Act to provide for the acquisition and transfer of the right, title and interest of the owners of the coking coal mines specified in the First Schedule, and the right, title and interest of the owners of such coke oven plants as are in or about the said coking coal mines with a view to reorganising and reconstructing such mines and plants for the purpose of protecting, conserving and promoting scientific development of the resources of coking coal needed to meet the growing requirements of the iron and steel industry and for matters connected therewith or incidental thereto.

BE it enacted by Parliament in the Twenty-third Year of the Republic of India as follows:—

CHAPTER I
PRELIMINARY

Short title and commencement.

1. (*1*) This Act may be called the Coking Coal Mines (Nationalisation) Act, 1972.

(2) The provisions of sections 30 and 31 shall come into force at once and the remaining provisions of this Act shall be deemed to have come into force on the 1st day of May, 1972.

Declaration as to the policy of the State.

2. It is hereby declared that this Act is for giving effect to the policy of the State towards securing the principles specified in clause (*b*) of article 39 of the Constitution.

Explanation.—In this section, "State" has the same meaning as in article 12 of the Constitution.

Definitions.

3. In this Act, unless the context otherwise requires,—

(*a*) "appointed day" means the 1st day of May, 1972;

(*b*) "coke oven plant" means the plant and equipment with which the manufacture of hard coke has been, or is being, carried on, and includes—

(*i*) all lands, buildings, works, machinery and equipment, vehicles, railways, tramways and sidings belonging to, or in, the coke oven plant,

(*ii*) all workshops belonging to the coke oven plant, including buildings, machinery, instruments, stores, equipment of such workshops and the lands on which such workshops stand,

(*iii*) all coke in stock or under production, and other stores, stocks and instruments, belonging to the coke oven plant,

(*iv*) all power stations belonging to the coke oven plant or operated for supplying electricity for the purpose of working the coke oven plant or a number of coke oven plants,

(*v*) all lands, buildings and equipment belonging to the coke oven plant where the washing of coal is carried on,

(*vi*) all other fixed assets, movable or immovable, and current assets belonging to a coke oven plant, whether within its premises or outside.

Explanation.—"Current assets" do not include dues from sundry debtors, loans and advances to other parties and investments, not being investments in the coke oven plant;

(*c*) "coking coal mine" means a coal mine in which there exists one or more seams of coking coal, whether exclusively or in addition to any seam of other coal:

(*d*) "company" means a company as defined in section 3 of the Companies Act, 1956, and includes a foreign company within the meaning of section 591 of that Act; 1 of 1956.

(*e*) "Commissioner" means the Commissioner of Payments appointed under section 20;

(*f*) "Custodian" means the Custodian appointed under sub-section (2) of section 14, to take over, or carry on, the management of a coking coal mine or coke oven plant;

(g) "date of assent" means the date on which assent is given by the President to this Act;

(h) "Government company" has the meaning assigned to it by section 617 of the Companies Act, 1956; 1 of 1956.

(i) "managing contractor" means the person, or body of persons, who, with the previous Consent in writing of the State Government, has entered into an arangement, contract or understanding, with the owner of a coking coal mine or coke oven plant under which the operations of the coking coal mine or coke oven plant are substantially controlled by such person or body of persons;

(j) "mine" means any excavation where any operation for the purpose of searching for or obtaining minerals has been or is being carried on, and includes—

(i) all borings and bore holes:

(ii) all shafts adjacent to, and belonging to, or in, a mine, whether in the course of being sunk or not;

(iii) all levels and inclined planes in the course of being driven;

(iv) all open cast working;

(v) all conveyors or aerial ropeways provided for bringing into or removal from a mine of minerals or other articles or for the removal of refuse therefrom;

(vi) all lands, buildings, works, adits, levels, planes, machnery and equipment, vehicles, railways, tramways and sidings belonging to, or in, or about, a mine;

(vii) all workshops belonging to, or in, a mine, including buildings, machinery, instruments, stores, equipment of such workshops and the lands on which such workshop stand;

(viii) all coal in stock or in transit or under production and other stores, stocks and instruments belonging to, or in, a mine;

(ix) all power stations belonging to, or in, a mine or operated for supplying electricity for the purpose of working the mine or a number of mines;

(x) all lands, buildings and equipment belonging to, or in, a mine where the washing of coal or manufacture of coke is carried on;

(xi) all other fixed assets, movable or immovable, and current assets, belonging to a mine, whether within its premises or outside.

Explanation.—"Current assets" do not include dues from sundry debtors, loans an dadvances to other parties and investments, not being investments in the coking coal mine;

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(k) "Mineral Concession Rules" means the rules, for the time being in force, made under the Mines and Minerals (Regulation and Development) Act, 1957; 67 of 195.

(l) "mining company" means a company owning a coking coal mine, and in relation to a foreign company within the meaning of section 591 of the Companies Act, 1956, the undertaking of that company in India; 1 of 1956.

(m) "notification" means a notification published in the Official Gazette;

(n) "owner",—

(i) when used in relation to a mine, has the meaning assigned to it in the Mines Act, 1952, 35 of 1952.

(ii) when used in relation to a coke oven plant, means any person who is the immediate proprietor or lessee or occupier of the coke oven plant or any part thereof or is a contractor for the working of the coke oven plant or any part thereof;

(o) "prescribed" means prescribed by rules made under this Act;

(p) "scheduled bank" means a bank included for the time being in the Second Schedule to the Reserve Bank of India Act, 1934; 2 of 1934.

(q) "specified date" means such date as the Central Government may, for the purpose of any provision of this Act, by notification, specify; and different dates may be specified for different provisions of this Act;

(r) words and expressions used herein and not defined but defined in the Coal Mines (Conservation, Safety and Development) Act, 1952, have the meanings, respectively, assigned to them in that Act; 12 of 1952.

(s) words and expressions used herein and not defined in this Act or in the Coal Mines (Conservation, Safety and Development) Act, 1952, but defined in the Mines Act, 1952, shall have the meanings, respectively, assigned to them in the Mines Act, 1952. 12 of 1952. 35 of 1952.

CHAPTER II

ACQUISITION OF THE RIGHTS OF OWNERS OF COKING COAL MINES AND COKE OVEN PLANTS

Acquisition of right in coking coal mines.

4. (1) On the appointed day, the right, title and interest of the owners in relation to the coking coal mines specified in the First Schedule shall stand transferred to, and shall vest absolutely in, the Central Government, free from all incumbrances.

(2) For the removal of doubts, it is hereby declared that if, after the appointed day, any other coal mine is found, after an investigation made by the Coal Board, to contain coking coal, the provisions of the Coking Coal Mines (Emergency Provisions) Act, 1971, shall, until that mine is nationalised by an appropriate legislation, apply to such mine. 64 of 1971.

Acquisition of rights of owners of coke oven plants.

5. On the appointed day, the right, title and interest of the owners of each of the coke oven plants specified in the Second Schedule, being the coke oven plants which are situated in or about the coking coal mines specified in the First Schedule, shall stand transferred to, and shall vest absolutely in, the Central Government, free from all incumbrances.

Central Government to be the lessee of the State Government.

6. (1) Where the rights of an owner under any mining lease granted, or deemed to have been granted, in relation to a coking coal mine, by a State Government or any other person, vest in the Central Government under section 4, the Central Government shall, on and from the date of such vesting, be deemed to have become the lessee of the State Government or such other person, as the case may be, in relation to such coking coal mine as if a mining lease in relation to such coking coal mine had been granted to the Central Government under the Mineral Concession Rules, the period of such lease being the entire period for which such lease could have been granted by the State Government or such other person under those Rules and, thereupon, all the rights under such mining lease, including surface, underground and other rights granted to the lessee shall be deemed to have been transferred to, and vested in, the Central Government.

(2) On the expiry of the term of any lease, referred to in sub-section (1), such lease shall, if so desired by the Central Government be renewed, on the same terms and conditions on which the lease was held on the appointed day, by the lessor for the maximum period for which such lease can be renewed under the Mineral Concession Rules.

Power of Central Government to direct vesting rights in a Government company.

7. (1) Notwithstanding anything contained in sections 4 to 6 (both inclusive), the Central Government may, if it is satisfied that a Government company is willing to comply, or has complied, with such terms and conditions as that Government may think fit to impose, direct, by an order in writing, that the right, title and interest of an owner in relation to a coking coal mine or coke oven plant referred to, respectively, in section 4 or section 5 shall, instead of continuing to vest in the Central Government, vest in the Government company either on the date of publication of the direction or on such earlier or later date (not being a date earlier than the appointed day), as may be specified in the direction.

(2) Where the right, title and interest of an owner in relation to a coking coal mine or coke oven plant vest in a Government company under sub-section (1), the Government company shall, on and from the date of such vesting, be deemed to have become—

(a) the lessee in relation to such coking coal mine as if a mining lease in relation to such coking coal mine had been granted to the Government company under the Mineral Concession Rules, the period of such lease being the entire period for which such lease could have been granted under those Rules;

(b) the owner of the coke oven plant,

and all the rights and liabilities of the Central Government in relation to such coking coal mine or coke oven plant shall, on and from the date of such vesting, be deemed to have become the rights and liabilities, respectively, of the Government company.

CHAPTER III

PAYMENT OF AMOUNT

Payment of amount to owners of coking coal mines.

10. The owner of every coking coal mine or group of coking coal mines specified in the second column of the First Schedule, shall be given by the Central Government, in cash and in the manner specified in section 21, for vesting in it, under section 4, the right, title and interest of the owner in relation to such coking coal mine or group of coking coal mines, an amount equal to the amount specified against it in the corresponding entry in the fifth column of the said Schedule.

Payment of amount to owners of coke oven plants.

11. The owner of every coke oven plant specified in the second column of the Second Schedule, shall be given by the Central Government, in cash and in the manner specified in section 21, for vesting in it, under section 5, the right, title and interest of the owner in relation to such coke oven plant, an amount equal to the amount specified against it in the corresponding entry in the fifth column of the said Schedule.

Payment of further amount.

12. (*1*) In consideration of the retrospective operation of the provisions of section 4 and section 5, there shall be given by the Central Government, in cash, to the owner of every coking coal mine specified in the First Schedule or the owner of every coke oven plant specified in the Second Schedule, an amount equal to the amount which would have been, but for the provisions of the said section 4 or section 5, as the case may be, payable to such owner under the Coking Coal Mines (Emergency Provisions) Act, 1971, for the period commencing on the 1st day of May, 1972, and ending on the date of assent.

64 of 1971.

(*2*) In addition to the amount specified in sub-section (*1*), there shall be given by the Central Government, in cash, to the owner of every coking coal mine specified in the First Schedule and the owner of every coke oven plant specified in the Second Schedule, simple interest at the rate of four per cent. per annum on the amount specified against such owner in the corresponding entry in the fifth column of the First Schedule or the Second Schedule, as the case may be, for the period commencing on the date of assent and ending on the date of payment of such amount to the Commissioner.

(*3*) The amounts referred to in sub-section (*1*) and sub-section (*2*) shall be in addition to the amount specified in the First Schedule or the Second Schedule, as the case may be.

Income derived by the owners of coking coal mines and coke oven plants after the appointed day to be refunded to the Central Government.

13. (*1*) Where, in pursuance of any decree, order or injunction made by a court, the Central Government or the Custodian appointed under the Coking Coal Mines (Emergency Provisions) Act, 1971, was prevented from taking over the management of any coking coal mine or coke oven plant, the owner of such coking coal mine or coke oven plant shall render, within sixty days from the date of assent, to the Central Government or the Government company, as the case may be, accounts, in relation to the period commencing on the appointed day and ending on the date of assent, with regard to the—

64 of 1971.

(*a*) assets or stores of the coking coal mine or coke oven plant acquired or sold by him during the said period;

(*b*) coal or coke sold or despatched during the said period;

(*c*) income derived by him from the coking coal mine or coke oven plant during the said period.

(*2*) If, on examination of the accounts referred to in sub-section (*1*), any income is found to have been derived by the owner from the coking coal mine or coke oven plant during the period referred to in that sub-section, such income shall be set off against the amount specified in the First Schedule or the Second Schedule, as the case may be, against the name of such owner, and the balance of such amount shall be paid to him.

(*3*) If no account is rendered by the owner of a coking coal mine or coke oven plant within the period referred to in sub-section (*1*) or if the Central Government or the Government company has any reason to believe that the account rendered by such owner is incorrect or false in material particulars, the Central Government or the Government company may refer the matter to the Commissioner and thereupon the Commissioner shall determine the income derived by the owner from the coking coal mine or coke oven plant during the period referred to in sub-section (*1*), and set off such income against the amount specified in the First Schedule or the Second Schedule, as the case may be, against the name of such owner and pay the balance to such owner.

CHAPTER IV

MANAGEMENT, ETC., OF COKING COAL MINES AND COKE OVEN PLANTS

Management, etc., of coking coal mines and coke oven plants.

14. (*1*) The general superintendence, direction, control and management of the affairs and business of a coking coal mine or coke oven plant, the right, title and interest of an owner in relation to which have vested in the Central Government under section 4 or section 5, as the case may be, shall,—

(*a*) in the case of a coking coal mine or coke oven plant, in relation to which a direction has been made by the Central Government under sub-section (*1*) of section 7, vest in the Government company specified in such direction, or

(*b*) in the case of a coking coal mine or coke oven plant, in relation to which no such direction has been made by the Central Government, vest in one or more Custodians appointed by the Central Government under sub-section (*2*),

and thereupon the Government company so specified or the Custodian so appointed, as the case may be, shall be entitled to exercise all such powers and do all such things as the owner of the coking coal mine or coke oven plant is authorised to exercise and do.

(*2*) The Central Government may appoint an individual or a Government company as the Custodian of a coking coal mine or coke oven plant in relation to which no direction has been made by it under sub-section (*1*) of section 7.

Duty of persons in-charge of management of coking coal mines or coke oven plants to deliver all assets.

15. (*1*) On the vesting of the management of a coking coal mine or coke oven plant in a Government company or on the appointment of a Custodian, all persons in charge of the management of such coking coal mine or coke oven plant immediately before such vesting or appointment, shall be bound to deliver to the Government company or Custodian, as the case may be, all assets, books of account, registers or other documents in their custody relating to the coking coal mine or coke oven plant, and any contract, whether express or implied, entitling the

management of the coking coal mine or coke oven plant made before the appointed day between such persons and the owners of such coking coal mine or coke oven plant, shall be deemed to have terminated on the date on which the management of the coking coal mine or coke oven plant vests in the Government company or the Custodian so appointed.

(2) The Central Government may issue such directions as it may deem desirable in the circumstances of the case to the Government company or Custodian as to its or his powers and duties and the Government company or Custodian may, also if it or he so desires, apply to the Central Government at any time for instructions as to the manner in which the management of the coking coal mine or coke oven plant shall be conducted by it or him or in relation to any other matter arising in the course of such management.

(3) The Custodian shall receive from the funds of the coking coal mine or coke oven plant, as the case may be, in relation to which he or it is the Custodian, such remuneration as the Central Government may fix and shall hold office during the pleasure of the Central Government.

Accounts and audit

16. The Custodian of every coking coal mine or coke oven plant shall maintain the accounts of such mine or plant in such manner and under such conditions as may be prescribed.

CHAPTER V

PROVISIONS RELATING TO EMPLOYEES OF COKING COAL MINES AND COKE OVEN PLANTS

Employment of certain employees to continue.

17. (1) Every person who is a workman within the meaning of the Industrial Disputes Act, 1947, and has been, immediately before the appointed day, in the employment of a coking coal mine or coke oven plant, shall become on and from the appointed day, an employee of the Central Government, or, as the case may be, of the Government company in which the right, title and interest of such mine or plant have vested under this Act, and shall hold office or service in the coking coal mine or coke oven plant, as the case may be, on the same terms and conditions and with the same rights to pension, gratuity and other matters as would have been admissible to him if the rights in relation to such coking coal mine or coke oven plant had not been transferred to, and vested in, the Central Government or Government company, as the case may be, and continue to do so unless and until his employment in such coking coal mine or coke oven plant is duly terminated or until his remuneration, terms and conditions of employment are duly altered, by the Central Government or the Government company.

14 of 1947.

(2) The Central Government or the Government company in which the right, title and interest in relation to a coking coal mine or coke oven plant have vested, may employ, on mutually acceptable terms and conditions, any person who is not a workman within the meaning of the Industrial Disputes Act, 1947, and who has been, immediately before the appointed day, in the employment of a coking coal mine or coke oven plant, and on such employment the said person shall become an employee of the Central Government or the Government company, as the case may be.

14 of 1947.

(3) Save as otherwise provided in sub-sections (1) and (2), the services of every person employed by the owner or occupier of a coking coal mine or coke oven plant before the appointed day shall stand terminated on and from the specified date.

(4) Notwithstanding anything contained in the Industrial Disputes Act, 1947, or in any other law for the time being in force, the transfer of the services of any officer or other employee from a coking coal mine or coke oven plant to any other coking coal mine or coke oven plant shall not entitle such officer or other employee to any compensation under this Act or any other law for the time being in force and no such claim shall be entertained by any court, tribunal or other authority. 14 of

(5) Where, under the terms of any contract of service or otherwise, any person whose service becomes terminated, or whose service becomes transferred to the Central Government or a Government company by reason of the provisions of this Act, is entitled to any payment by way of gratuity or retirement benefit or for any leave not availed of, or any other benefits, such person may enforce his claim against the owner of the coking coal mine or coke oven plant, as the case may be, but not against the Central Government or the Government company.

Provident fund.

18. (1) Where a coking coal mine or coke oven plant has established a provident fund for the benefit of its employees, the monies relatable to the employees, whose services have become transferred, by or under this Act, to the Central Government or a Government company, shall, out of the monies standing, on the appointed day, to the credit of such provident fund, stand transferred to, and vest in, the Central Government or the Government company, as the case may be.

(2) The monies which stand transferred, under sub-section (1), to the Central Government or a Government company shall be dealt with by that Government or company, as the case may be, in such manner as may be prescribed.

Superannuation, welfare and other funds.

19. Where a superannuation, welfare or other fund has been established for the benefit of the employees whose services stand transferred to the Central Government or a Government company, the coking coal mine or coke oven plant, by which such employees were employed, shall distribute the amount due to each such employee as if the employee had superannuated, or his services with the coking coal mine or coke oven plant had terminated, on the day immediately preceding the specified date.

CHAPTER VI

COMMISSIONER OF PAYMENTS

Commissioner of Payments to be appointed.

20. (1) For the purpose of disbursing the amounts payable to the owner of each coking coal mine or coke oven plant, the Central Government shall appoint such person as it may think fit to be the Commissioner of Payments.

(2) The Central Government may appoint such other persons as it may think fit to assist the Commissioner.

(3) The salaries and allowances of the Commissioner and other persons appointed under this section shall be defrayed out of the Consolidated Fund of India.

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14 of 1947.

Payment by the Central Government to the Commissioner.

21. (1) The Central Government shall, within thirty days from the specified date, pay, in cash, to the Commissioner, for payment to the owner of a coking coal mine or coke oven plant, a sum equal to the sum specified against the coking coal mine or coke oven plant, as the case may be, in the First Schedule or the Second Schedule together with the amount and interest, if any, referred to in section 12.

(2) In addition to the sum referred to in sub-section (1), the Central Government shall pay, in cash, to the Commissioner, such amount as may become due to the owner of a coking coal mine or coke oven plant in relation to the period during which the management of the coking coal mine or coke oven plant remained vested in the Central Government.

(3) The Commissioner shall open and operate an account in a scheduled bank in respect of each coking coal mine or coke oven plant.

(4) Every amount paid to the Commissioner shall be deposited to the credit of the account, referred to in sub-section (3), of the coking coal mine or coke oven plant to which the payment relates.

(5) Interest accruing on the amount standing to the credit of the account referred to in sub-section (3) shall enure to the benefit of the owner of the coking coal mine or coke oven plant, as the case may be.

(6) References in this section to the owner of a coking coal mine shall, in relation to a group of coking coal mines specified in the First Schedule, be construed as references to the owner of that group of coking coal mines.

Statement of accounts in relation to the period of management by the Central Government, etc.

22. (1) The Central Government or the Government company, as the case may be, shall cause the books in relation to each coking coal mine or coke oven plant, the management of which has vested in it under the
64 of 1971. Coking Coal Mines (Emergency Provisions) Act, 1971, to be closed and balanced as on the 30th day of April, 1972, and shall cause a statement of accounts, as on that day, to be prepared, within such time, in such form and in such manner as may be prescribed, in relation to each such mine or plant in respect of the transactions effected by it during the period for which the management of such coking coal mine or coke oven plant remained vested in it:

Provided that where two or more coking coal mines or coke oven plants were owned, before the commencement of this Act, by the same owner, a consolidated statement of accounts may be prepared for all the coking coal mines or coke oven plants owned by such owner.

(2) All amounts received by the Central Government or the Government company after the closure of such accounts shall, where such amounts relate to transactions effected before the appointed day, be included in the said statement of accounts in respect of the coking coal mine or coke oven plant to which the said receipt relates.

(3) The Central Government or the Government company in which the right, title and interest of the coking coal mine or coke oven plant stands vested shall be entitled to receive, up to the specified date, to the exclusion of all other persons, any money, due to the coking coal mine or

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coke oven plant, as the case may be, realised after appointed day notwithstanding that the realisations pertain to a period prior to the appointed day:

Provided that where such realisations have not been included in the statement of accounts as on the 30th day of April, 1972, a supplementary statement of accounts shall be prepared and furnished, at such intervals as may be prescribed, by the Central Government or the Government company to the owner of the coking coal mine or the coke oven plant, as the case may be.

(4) The liabilities of the coking coal mine or the coke oven plant (not being liabilities arising out of advances made by the Central Government or Government company), which could not be discharged by the appointed day, may be discharged by the Central Government or the Government company up to the specified date, and every payment made for the settlement with the owner shall be included in the statement of accounts as on the 30th day of April, 1972, indicating therein the period in relation to which the payments were made:

Provided that the liabilities in relation to the period prior to the appointed day, which have not been discharged on or before the specified date, shall be the liabilities of the owner of the coking coal mine or the coke oven plant, as the case may be.

(5) A copy of each statement of accounts prepared under this section shall be delivered by the Central Government or the Government company, as the case may be, to the Commissioner and also to the owner:

Provided that where the number of owners is more than one, only one copy of the statement of accounts shall be given to the owners for the benefit of all of them.

(6) The statement of accounts prepared under this section shall be audited by a person who is qualified to be appointed as an auditor of a company under section 226 of the Companies Act, 1956, and the auditor so appointed shall receive, from the funds of the coking coal mine or coke oven plant, as the case may be, such remuneration as the Central Government may fix. 1 of 1956.

(7) The audit of the statement of accounts shall be conducted in such manner as the Central Government may direct.

Claims to be made to the commissioner.

23. (1) Every person having a claim against the owner of a coking coal mine or coke oven plant shall prefer such claim before the Commissioner within thirty days from the specified date:

Provided that if the Commissioner is satisfied that the claimant was prevented by sufficient cause from preferring the claim within the said period of thirty days, he may, on the expiry of the said period of thirty days, entertain the claim within a further period of thirty days, but not thereafter.

(2) Notwithstanding anything contained in any other law for the time being in force, there shall be paid in priority to all other unsecured debts, not being the amounts advanced by the Central Government or

[illegible] the Custodian appointed under the Coking Coal Mines (Emergency Provisions) Act, 1971, for the management of the coking coal mine or coke oven plant, as the case may be [illegible]

(a) all wages or salary (including wages payable for time or piece work and salary earned wholly or in part by way of commission) of any employee, in respect of services rendered to the coking coal mine or coke oven plant, as the case may be, [illegible] compensation payable to any workman under any provisions of Chapter V-A of the Industrial Disputes Act, 1947;

(b) all amounts [illegible] the twelve months next before the appointed day, under the Coal Mines Provident Fund, Family Pension and Bonus Schemes Act, 1948, or any other law [illegible] in force;

(c) all amounts [illegible] compensation [illegible] respect of the death [illegible] coal mine or coke oven plant [illegible] such mine [illegible] contract [illegible] rights capable of being transferred to and vested [illegible]

(d) all sums due to any employee from a provident fund, pension fund or gratuity fund or any other fund established for the welfare of the employees of the coking coal mine or coke oven plant [illegible]

(e) all other dues [illegible] State Government [illegible] department, as the case may be [illegible]

(3) The debts [illegible] shall [illegible] themselves and be paid in full, [illegible] in which case they [illegible] in equal proportions [illegible] accordingly.

(4) The Commissioner shall fix a certain date on or before which [illegible] shall [illegible] benefit of the disbursement [illegible] the Commissioner.

(5) Not less than [illegible] given by advertisement [illegible] of the daily newspapers [illegible] end [illegible] the Commissioner [illegible] and [illegible] the claimant [illegible] his claim [illegible] within [illegible]

(6) Every claimant [illegible] the proof of [illegible] notified by the [illegible] made by the [illegible]

(7) The Commissioner shall, [illegible] such investigation as may, in his opinion, be necessary and after giving the owner of the coking coal mine or coke oven plant, as the case may be, an opportunity of refuting the claim and after giving the claimant a reasonable opportunity of being heard, in writing admit or reject the claim in whole or in part.

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(8) The Commissioner shall have the power to regulate his own procedure in all matters arising out of the discharge of his functions including the place or places at which he will hold his sittings and shall, for the purpose of making any investigation under this Act, have the same powers as are vested in a civil court under the Code of Civil Procedure, 1908, while trying a suit, in respect of the following matters, namely:—

(a) the summoning and enforcing the attendance of any witness and examining him on oath;

(b) the discovery and production of any document or other material object producible as evidence;

(c) the reception of evidence on affidavits;

(d) the issuing of any commission for the examination of witnesses.

(9) Any investigation before the Commissioner shall be deemed to be a judicial proceeding within the meaning of sections 193 and 228 of the Indian Penal Code and the Commissioner shall be deemed to be a civil court for the purposes of section 195 and Chapter XXXV of the CODE of Criminal Procedure, 1898. 45 of 1860. 5 of 1898.

(10) A claimant who is dissatisfied with the decision of the Commissioner may prefer an appeal against the decision, to the principal civil court of original jurisdiction within the local limits of whose jurisdiction the coking coal mine or coke oven plant, as the case may be, is situated.

Disbursement of money by the Commissioner.

24. Where the total amount of the claim admitted by the Commissioner does not exceed the total amount of the money credited to the account of a coking coal mine or coke oven plant, every such admitted claim shall rank equally among themselves and be paid in full, and the balance, if any, shall be paid to the owner, but where such amount is insufficient to meet in full the total amount of the admitted claims, every such claim shall abate in equal proportions and be paid accordingly.

Amounts advanced by the Central Government how to be recovered.

25. Every amount advanced by the Central Government or the Custodian, as the case may be, for the management of a coking coal mine or coke oven plant shall be recovered from the income derived by such coking coal mine or coke oven plant in respect of the period during which the management of such mine or plant remained vested in the Central Government:

Provided that where such income is insufficient to meet in full the total amount of the advances made by the Central Government or the Custodian for the management of the coking coal mine or coke oven plant, the Central Government may make a claim to the Commissioner for the deficiency of the amount so advanced and the claim in respect of such deficiency shall have priority over the claims of all other unsecured creditors of the coking coal mine or coke oven plant.

Explanation.—In this section, "Custodian" means the Custodian appointed under the Coking Coal Mines (Emergency Provisions) Act, 1971. 64 of 1971.

Disputes how to be dealt with.

26. (1) In the event of there being a doubt or dispute as to the right of a person to receive the whole or any part of the amount referred to in sections 10, 11 and 12, the Commissioner shall refer the matter to the court for a decision, and shall make the disbursements in accordance with the decision of the court.

(2) In relation to a coking coal mine or coke oven plant, the operations of which were, immediately before the 17th day of October, 1971 under the control of a managing contractor, the amount specified in the First Schedule against such coking coal mine or in the Second Schedule against such coke oven plant shall be apportioned between the owner of the coking coal mine or coke oven plant and such managing contractor in such proportions as may be agreed upon by or between the owner and such managing contractor, and in the event of there being no such agreement, in such proportions as may be determined by the court.

Explanation.—In this section, "court", in relation to a coking coal mine or coke oven plant, means the principal civil court of original jurisdiction within the local limits of whose jurisdiction the coking coal mine or coke oven plant is situated.

Undisbursed or unclaimed amounts to be deposited to the general revenue account.

27. Any money paid to the Commissioner which remains undisbursed or unclaimed after such payment for a period of three years shall be transferred by the Commissioner to the general revenue account of the Central Government; but a claim to any money so transferred may be preferred to the Central Government by the person entitled to such payment and shall be dealt with as if such transfer had not been made, the order, if any, for payment of the claim being treated as an order for the refund of revenue.

CHAPTER VII

MISCELLANEOUS

Effect of Act on other laws.

28. The provisions of this Act shall have effect notwithstanding anything inconsistent therewith contained in any other law for the time being in force or in any instrument having effect by virtue of any law other than this Act, or in any decree or order of any court, tribunal or other authority.

Contracts cease to have effect unless ratified by the Central Government.

29. (*1*) Every contract entered into by the owner or occupier of any coking coal mine or coke oven plant for any service, sale or supply before the appointed day shall, on and from the expiry of one hundred and twenty days from the date of assent, cease to have effect unless such contract is, before the expiry of that period, ratified, in writing, by the Central Government and in ratifying such contract the Central Government may make such alterations or modifications therein as it may think fit:

Provided that the Central Government shall not omit to ratify a contract unless it is satisfied that such contract is unduly onerous or has been entered into in bad faith or is detrimental to the interests of the coking coal mine or coke oven plant.

(2) The Central Government shall not omit to ratify a contract or make any alteration or modification therein except after giving to the parties to the contract a reasonable opportunity of being heard and except after recording in writing its reasons for refusal to ratify the contract.

Penalties.

30. Any person who,—

(*a*) having in his possession, custody or control of any property forming part of the undertaking of any coking coal mine or coke oven plant referred to in the First Schedule or the Second Schedule, as the case may be, wrongfully withholds such property from the Central Government, or Government company, or

(*b*) wrongfully obtains possession of, or retains, any property forming part of the undertaking of any coking coal mine or coke oven plant referred to in the First Schedule or the Second Schedule, as the case may be, or wilfully withholds or fails to furnish to the Central Government or any person specified by that Government, any document relating to such coking coal mine or coke oven plant, which may be in his possession, custody or control, or fails to deliver to the Custodian any assets, books of account, registers or other documents in his custody relating to the coking coal mine or coke oven plant in respect of which a Custodian has been appointed, or

(*c*) wrongfully removes or destroys any property of any coking coal mine or coke oven plant or prefers any claim under this Act in relation to such mine or plant, which he knows or has reasonable cause to believe to be false or grossly inaccurate,

shall be punishable with imprisonment for a term which may extend to two years, or with fine which may extend to ten thousand rupees, or with both.

Offences by companies.

31. (*1*) Where an offence under this Act has been committed by a company, every person who at the time the offence was committed was in charge of, and was responsible to, the company for the conduct of the business of the company as well as the company, shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly:

Provided that nothing contained in this sub-section shall render any such person liable to any punishment, if he proves that the offence was committed without his knowledge or that he had exercised all due diligence to prevent the commission of such offence.

(*2*) Notwithstanding anything contained in sub-section (*1*), where any offence under this Act has been committed with the consent or connivance of, or is attributable to, any neglect on the part of, any director, manager, secretary or other officer of the company, such director, manager, secretary or other officer shall be deemed to be guilty of that offence and shall be liable to be proceeded against and punishd accordingly.

Explanation.—For the purposes of this section,—

(*a*) "company" means any body corporate and includes a firm or other association of individuals; and

(*b*) "director", in relation to a firm, means a partner in the firm.

Mining companies not to be wound up by court.

32. No proceeding for the winding up of a mining company, the right, title and interest in relation to the coking coal mine or coke oven plant owned by which have vested in the Central Government or in a Government company under this Act or for the appointment of a receiver in respect of such business, shall lie in any court except with the consent of the Central Government.

Delegation of powers.

33. (1) The Central Government may, by nitification, direct that all or any of the powers exercisable by it under this Act may also be exercised by any person or persons as may be specified in the notification

(2) Whenever any delegation of power is made under sub-section (1), the person to whom such power has been delegated shall act under the direction, control and supervision of the Central Government.

Power to make rules.

34. (1) The Central Government may, by notification, make rules to carry out the provisions of this Act.

(2) In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely:—

(a) the manner in which the coking coal mines or coke oven plants shall be managed by a Government company or a Custodian;

(b) the manner in which provident fund monies referred to in section 18 shall be dealt with;

(c) the form and manner in which the statement of accounts referred to in section 22 shall be prepared;

(d) any other matter in relation to which such rule is required to be, or may be, made.

(3) Every rule made by the Central Government under this Act shall be laid, as soon as may be after it is made, before each House of Parliament, while it is in session, for a total period of thirty days which may be comprised in one session or in two or more successive sessions, and if, before the expiry of the session immediately following the session or the successive sessions aforesaid, both Houses agree in making any modification in the rule or both Houses agree that the rule should not be made, the rule shall thereafter have effect only in such modified form or be of no effect, as the case may be; so, however, that any such modification or annulment shall be without prejudice to the validity of anything previously done under that rule.

Power to remove difficulties.

35. If any difficulty arises in giving effect to the provisions of this Act, the Central Government may, by order, not inconsistent with the provisions of this Act, remove the difficulty:

Provided that no such order shall be made after the expiry of a period of two years from the date of assent.

Coking coal mines to which the Act shall not apply.

36. Nothing in this Act shall apply to any coking coal mine—

(a) owned or managed by a Government company or corporation owned or controlled by Government:

(b) owned or managed by a company engaged in the production of iron or steel:

Provided that this section shall not extend to such mine or part thereof which, in the opinion of the Central Government, is in excess of the requirements for the production of iron and steel by that company.

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THE FIRST SCHEDULE

(See sections 4 and 10)

Sl. No.	Name of the mine	Location of the mine	Name and address of the owners of the mine	Amount (in rupees)
1	2	3	4	5
1	Dhori (EB-1)	Post office Bermo, District Hazaribagh.	Ownership under dispute.	6,77,500
2	Kalyani Selected Kargali (EB-2)	Post Office Pichri, District Hazaribagh.	Gouri Shanker and Others, Post Office Bermo, Hazaribagh.	7,19,000
3	Khas Dhori (EB-3)	Post Office, Pichri, District Hazaribagh.	Khas Dhori Colliery Company, Post Office Katrasgarh, Dhanbad.	4,07,000
4	Pipradih (EB-4)	Post Office, Gomiabagh District Hazaribagh.	Pacific Coal Company, Post Office Gomia, District Hazaribagh.	14,13,500
5	Pichri (EB-5)	Post Office Pichri, District Hazaribagh.	Pichri Colliery Company Private Limited, Post Office Bermo, Hazaribagh.	3,21,800
6	Selected Dhori (EB-6)	Post Office Bermo, District Hazaribagh.	Selected Dhori Colliery, Post Office Katrasgarh, Dhanbad.	7,43,500
7	Turiyo (EB-7)	Post Office Turiyo, District Hazaribagh.	Bhubaneswar Singh and Shivdayal Rathi Post Office, Jharia, Dhanbad.	5,74,000
8	Tarmi (EB-8)	Post Office Turiyo, District Hazaribagh.	Tarmi Colliery Company, Industrial Bank Building, Post Office Jharia, Dhanbad.	8,30,500
9	Albion (J-1)	Post Office Karmatand	Albion Colliery Company, Post Office Karmatand, Dhanbad.	4,02,000
10	Bokaro Jharia (J-3)	Post Office Karmatand	Messrs. Agarwalla Brothers, Post Office Karmatand, Dhanbad.	4,64,0000
11	North Damuda (J-3)	Post Office Nudkhurkee	Hazaribagh Coal Syndicate Private Limited, Post Office, Jharia, Dhanbad.	8,39,300
12	Kessurgarh (J-4)	Post Office Nudkhurkee	Manbhoom Coal Syndicate Limited, Post Office Jharia, Dhanbad.	27,50,000
13	Madhubandi (J-5)	Post Office Nudkhurkee	Oriental Coal Company Limited 25, Brabourne Road, Calcutta-1.	1,17,59,500
14	Kankanee (J-67)	Post Office Bansjora		
15	Pootkee (J-69)	Post Office Kusunda		
16	Amlabad (J-188)	Post Office Bhowrah		
17	Bhowrah North (J-189)	Post Office Bhowrah		
18	Bhowrah South (J-190)			
19	Mahalbani (J-191)			
20	Begunia (R-6)	Post Office Barakar, District Burdwan.		
21	Khas Benedih (J-6)	Post Office Nawagarh	K. C. Mukherjee and Others, Post Office Hirapur, Dhanbad.	2,88,000
22	Benedih (J-7)	Post Office Nudkhurkee	Benedih Coal Concern, Post Office Katras, Dhanbad.	3,03,000

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Sl. No.	Name of the mine	Location of the mine	Name and address of the owners of the mine	Amount (in rupees)
1	2	3	4	5
23	Khas Ganeshpur (J-8)	Post Office Nawagarh	Khas Ganeshpur Coal Mines Limited, 135, Canning Street, Calcutta.	37,500
24	Ganeshpur (J-9)	Post Office Nawagarh	Ganeshpur Coal Company Private Limited, Post Office Ganeshpur, Dhanbad.	37,500
25	Ashakuti Phularitand (J-10)	Post Office Kharkharee	Ashakuti Coal Company Limited, 1/1, Rowland Road, Calcutta—20.	18,19,000
26	Mohanpur (J-11)	Post Office Kharkharee	Shrimati Parbati Devi, Post Office Kharkharee, Dhanbad.	25,000
27	New Bansiora (J-12)	Post Office Kharkharee	S. K. Sahana and Sons Private Limited, Post Office Kharkharee, Dhanbad.	1,49,000
28	Khas Bhurangya (J-13)	Post Office Mohuda	Khas Bhurangya Coal Company, Post Office Jharia, Dhanbad.	5,000
29	Raneedih/Pipratand (J-14)	Post Office Mohuda	Shri K. L. Sablok, C/o Sudarsan Motors, Post Office Dhansar, Dhanbad.	35,000
30	East Mucheraidih (J-15)	Post Office Mohuda	East Mucheraidih Coal Company, Limited, Post Office Jharia, Dhanbad.	5,000
31	New Huntodih (J-16)	Post Office Mohuda	New Huntodih Coal Company Limited, 178, Mahatma Gandhi Road, Calcutta-I.	21,300
32	Bhatdee (J-19)	Post Office Mohuda	Bengal Bhatdee Coal Company Limited, 14, Netaji Subhas Road, Calcutta.	19,60,800
33	Kharkharee (J-20)	Post Office Kharkharee	Bharat Mining Corporation Limited, 91, Stephen House Dalhousie Square East, Calcutta-1.	19,66,000
34	New Sinidih (J-21)	Post Office Kharkharee	Messrs. Bamandiha Coal Company Limited, 3, Synagogue Street, Calcutta-1.	39,500
35	Dharmaband (J-22)	Post Office Katrasgarh	H. M. Barat and M.C. Barat, Post Office Katrasgarh, Dhanbad.	16,300
36	New Dharmaband (J-23)	Post Office Malkera	Sethia Mining and Manufacturing Company Limited, 4, Bakul Bagan Road, Calcutta.	17,05,000
37	Sinidih (J-25)	Post Office Katrasgarh	Sinidih Colliery Concern Private Limited, Post Office Katrasgarh, Dhanbad.	5,13,500
38	Tundoo Khas (J-26)	Post Office Tundoo	J. P. Lala & Sons Collieries Private Limited, Post Box No. 76, Dhanbad.	4,79,000
39	Bilbera (J-37)	Post Office Katrasgarh	B. N. Mondal and Company, 22, Canning Street, Calcutta.	13,93,500
40	Jealgora Govindpur (J-28)	Post Office Sonardih	Jealgora Govindpur Colliery Company Limited, Post Office Sonardih, Dhanbad.	12,50,500
41	South Govindpur (J-29)	Post Office Katrasgarh	H. I. Pathak, Post Office Katrasgarh, Dhanbad.	4,22,500
42	Diamond Tettuliya (J-30)	Post Office Sonardih	Bihar Collieries Limited, District Dhanbad.	15,000
43	Central Tetturya (J-31)	Post Office Malkera	Sri Tarapada Lodha & Others, Post Office Katrasgarh, District Dhanbad.	7,500

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Sl. No.	Name of the mine	Location of the mine	Name and address of the owners of the mine	Amount (in rupees)
1	2	3	4	5
44	New Tentulia (J-32)	Post Office Malkera	Tentulia Khas Colliery Company Limited, 25, Barbourne Road, Calutta.	16,86,500
45	Central Kooridih Sonardih (J-33)	Post Office Katrasgarh	Central Kooridih Colliery Company, Post Office Katrasgarh, Dhanbad.	12,23,500
46	New Gobindpur (J-34)	Post Office Sonardih	New Gobindpur Coal Company Limited, 33, Canning Street, Calcutta-1.	13,92,000
47	Khas Mehtadih (J-35)	Post Office Katrasgarh	Messrs. Khas Mehtadih Colliery Company, Post Office Katrasgarh, Dhanbad.	13,80,000
48	Agardih (J-36)	Post Office Katrasgarh	Agardih Colliery Company, Post Office Katrasgarh, District Dhanbad.	3,78,800
49	Katras Choitodih (J-37)	Post Office Katrasgarh	Burrakar Coal Company Limited, Chartered Bank Building, Calcutta-1.	1,68,56,000
50	Mudidih (J-62)	Post Office Sijua		
51	Badruchuk (J-63)			
52	Loyabad (J-68)	Post Office Bansjora		
53	Lakurka (J-38)	Post Office Katrasgarh	Lakurka Coal Company Limited, 3, Synagogue Street, Calcutta.	7,27,000
54	Koiludih (J-39)	Post Office Katrasgarh	Messrs. East Katras Colliery Company Private Limited, Post Office Katrasgarh, Dhanbad.	20,08,000
55	East Katras (J-41)			
56	Khas Govindpur (J-40)	Post Office Katagarh	Khas Govindpur Coal Company Private Limited, Post Office Katrasgarh, Dhanbad.	2,65,000
57	East Salanpur (J-42)	Post Office Katrasgarh	East Salanpur Colliery Company, Post Office, Katrasgarh, Dhanbad.	2,97,500
58	Joint Salampur (J-43)			
59	Khas Salanpur (J-44)			
60	North Salanpur (J-45)	Post Office Katrasgarh	Sahai Brothers (Receiver H. S. Sahai), Post Office Katrasgarh, Dhanabad.	1,00,000
61.	Selected Salanpur (J-46)	Post Office Katrasgarh	Central Salanpur Colliery Company, Post Office Katrasgarh, Dhanbad.	5,000
62	Central Salanpur (J-47)	Post Office Katrasgarh	Central Salanpur Coal Concern, Post Office Katrasgarh, Dhanbad.	1,84,500
63	Lakurka Khas (J-48)	Post Office Katrasgarh	Bharat's Debutter Estate, Post Office Katrasgarh, Dhanbad.	1,96,800
64	Salanpur (J-49)	Post Office Katrasgarh	M/s. New Lakurka Colliery Company and Shrimati Sarojini Devi, Post Office, Katrasgarh, Dhanbad.	4,14,500
65	New Lakurka (J-50)			
66	National Angarpathra (J-51)	Post Office Katrasgarh	National Coal Company Private Limited, 48/1, Rani Tarun Bose Lane, Calcutta-6.	2,89,000
67	Union Angarpathra (J-52)	Post Office Sijua	Union Coal Company Limited, 135, Biplabi Rash Behari Basu Road, Calcutta-1.	4,51,000
68	Gaslitam (J-53)	Post Office Sijua	New Manbhum Coal Company 138, Biplabi Rash Behari Basu Road, Calcutta-1.	12,42,000
69	Ramkanali (J-54)	Post Office Katrasgarh	Bijali Kanti Roy, Keshalpur House, Post Office Katrasgarh, Dhanbad.	4,70,000

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Kuya Colliery

Sl. No.	Name of the mine	Location of the mine	Name and address of the owners of the mine	Amount (in rupees)
1	2	3	4	5
70	Trigunait (J-55)	Post Office Katrasgarh	East Angarpathra Colliery Company Limited, Post Office Katrasgarh, Dhanbad.	16,20,000
71	Kanta Pahari (J-56)			
72	Khas Angarpathra (J-57)			
73	Jharia Khas (J-58)			
74	East Angarpathra (J-59)			
75	Mahabir Angarpathra (J-60)			
76	Diamond Angarpathra (J-61)	Post Office Katrasgarh	Diamond Angarpathra Colliery Company, Post Office Katrasgarh, Dhanbad.	5,000
77	Jogta (J-64)	Post Office Sijua	Jogta Coal Company Limited, Post Office Sijua, Dhanbad.	6,82,000
78	Sendra (J-65)	Post Office Bansjora	Messrs. Hind Shippers Limited, 135, Biplabi Rash Behari Basu Road, Calcutta—1.	9,99,000
79	Sendra Bansjora-Gopal Gararia (J-66)	Post Office Bansjora	Messrs. Sendra Bansjora Colliery Company Private Limited, 135, Canning Street, Calcutta—1.	18,29,000
80	North Ekra (J-78)			
81	Gararia (J-79)			
82	Gopalichuck (West) (J-70)	Post Office Kusunda	Central Kirkend Coal Company Limited, 91, Stephen House, Dalhousie Square East, Calcutta—1.	6,94,000
83	Central Kirkend (J-71)			
84	Motiram's Kirkend (J-72)	Post Office Kusunda	Motiram Rochaniai Coal Company Private Limited, Dhanad.	43,800
85	Khas Kirkend (J-73)	Post Office Kusunda	Phuramal Agrwal, Post Office Dhansar, Dhanbad.	18,300
86	Kirkend (J-74)	Post Office Kusunda	New Marine Coal Company (Bengal) Limited, 111, Chittaranjan Avenue, Calcutta.	16,24,000
87	New Marine (J-75)			
88	Bansdeopur (J-77)	Post Office Kusunda	New Bansdeopur Coal Company Limited, 26-B, Netaji Subhas Road, Calcutta.	4,44,500
89	Central Gararia (J-80)	Post Office Bansjora	Central Gararia Colliery Company Private Limited, Post Office Bansjora, Dhanbad.	58,800
90	Gararia (J-81)	Post Office Bansjora	Tikmani and Company, Post Office Bansjora, Dhanbad.	1,34,000
91	Chhota Bowa (J-82)	Post Office Bansjora	Chhota Bowa Colliery Company Limited, Post Office Bansjora, Dhanbad.	3,27,500
92	Murulidih (J-17)	Post Office Mohuda	Kalyanji Mavji and Company, 14, Netaji Subhas Road, Calcutta—1.	21,33,000
93	West Bhuggatdih (J-95)	Post Office Jharia		
94	Industry (J-96)	Post Office Dhansar		
95	West Ena (J-97)	Post Office Dhansar		
96	Murulidih 20 and 21 Pits. (J-18)	Post Office Mohuda	Bengal Coal Company Limited, 8, Clive Row, Calcutta—1	49,49,000
97	Chanch (R-3)	Post Office Chirkunda, District Dhanbad.		
98	Maheshpur (J-24)	Post Office Katrasgarh	Messrs. Sahu Minerals and Properties Limited, A-3, Prithviraj Road, Jaipur.	29,68,000
99	Ekra Khas (J-76)	Post Office Kusunda		
100	Busseriya (J-83)	Post Office Kusunda	Busseriya Coal Company (Private) Limited, 13, Radha Bazar Lane, Calcutta—1.	4,29,500
101	Busseriya North and South (J-85)			

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कुईयां कोलियरी
Kuya Colliary

Sl. No.	Name of the mine	Location of the mine	Name and address of the owners of the mine	Amount (in rupees)
1	2	3	4	5
102	East Extra (J-84)	Post Office Bansjora	East Ukra Coal Compnay, C/o K. Worah, Jora Bangalow, Dhanbad.	11,300
103	North Bussetiya (J-86)	Post Office Bansjora	North Busseriya Colliery Company, Post Office Bansjora, Dhanbad.	1,75,300
104	Surendra East Loyabad (J-87)	Post Office Kirkend	Surendra East Loyabad Colliery, Compnay, Post Office Jharia, Dhanbad.	1,24,500
105	Gondudih (J-88)	Post Office Kusunda	Central Alkusa Colliery Company, Post Office Kusunda, Dhanbad.	3,57,000
106	Dhariajoba (J-89)	Post Office Kirkend	M/s. H. D. Agarwalla & Sons, Post Office Jharia, Bihar.	13,65,000
107	West Godhur (J-90)	Post Office Kusunda		
108	Godhur (J-91)	Post Office Kusunda	Godhur Colliery Compnay, Post Office Kusunda, Dhanbad.	33,07,000
109	Pure Kustore (J-92)	Post Office Kusunda	Pure Kustore Colliery Compnay, Post Office Kusunda, Dhanbad.	19,27,500
110	Nayadee Kusunda (J-93)	Post Office Kusunda	Kusunda Nayadee Colliery Company (Private) Limited, Post Office Kusunda Dhanbad.	27,42,000
111	Kusunda (J-94)	Post Office Kusunda	Not available.	5,000
112	Kendwadih (J-98)	Post Office Kusunda	East India Coal Compnay Ltd., Post Office Jealgora, Dhanbad.	93,28,500
113	South Bulliary (J-101)	Post Office Kusunda		
114	Jealgora (J-184)	Post Office Jealgora		
115	Bararee Joyarampur (J-168)			
116	Bararee (J-185)			
117	Balihari C.T.C. (J-99)	Post Office Kusunda	Not available.	22,500
118	Kutchi Balihari (J-100)	Post Office Kusunda	Balihari Colliery Compnay Limited, 14, Netaji Subhas Road, Calcutta-1.	6,53,000
119	Bhagaband (J-102)	Post Office Bhagaband	The Borrea Coal Compnay Limited, Chartered Bank Building, Calcutta-1.	32,58,000
120	Gonshadih (J-104)	Post Office Kusunda	Sri Biswanath Roy, Kesha pur House, Post Office Katrasgarh, Dhanbad.	12,90,500
121	Kendwadih (J-103)	Post Office Bhaga	Equitable Coal Company Limited, 1/2-Lord Sinha Road, Calcutta-16.	98,800
122	Bhurgoria (J-109)			
123	Hurriladih (J-110)			
124	Alkusa South (J-105)	Post Office Kustore	Raneegunge Coal Association Limited, 3A, Chowringhee Place, Calcutta-13.	91,95,000
125	Kustore (J-106)	Post Office Kustore		
126	Burragarh (J-107)	Post Office Jharia		
127	Pure Burragarh (J-108)			
128	Simlabahal (J-111)	Post Office Jharia	Shri P. Roy, Director and nominated owner, Bhalgora Coal Compnay, 3, Synagogue Street, Calcutta.	4,93,000

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Sl. No.	Name of the mine	Location of the mine	Name and address of the owners of the mine	Amount (in rupees)
1	2	3	4	5
129	Bhuggatdih (J-112)	Post Office Dhansar	Bengal Nagpur Coal Company, 5, Synagogue Street, Calcutta—1.	6,47,000
130	Ena (J-113)	Post Office Dhansar	North West Coal Company Limited, 5, Synagogue Street, Calcutta,-1.	9,77,500
131	East Bhalgora (J-114)	Post Office Jharia	East Bhuggatdih Colliery Company (Private) Limited, Post Office Jharia, Dhanbad.	17,08,000
132	Khas Jharia (J-115)			
133	East Ena (J-116)			
134	East Bhuggatdih (J-117)			
135	Selected Khas Jharia (J-118)			
136	Selected Jharia (J-119)			
137	Selected Model Jharia (J-121)			
138	Bhalgora (J-120)	Post Office Jharia	Bhalgora Coal Company Limited, 3, Synagogue Street, Calcutta-1.	4,86,000
139	New Khas Jharia (J-122)	Post Office Jharia	Fularibad Colliery Company, Post Office Jharia, Dhanbad.	15,000
140	Fularibad (J-123)			
141	Sonatibad (J-138)			
142	Rajapur (J-125)	Post Office Jharia	Rajapur Colliery Company Limited, Post Office Jharia, Dhanbad.	2,39,000
143	Khas Bhuggatdih (J-126)	Post Office Jharia	Khas Bhuggatdih Colliery Company, Post Office Jharia, Dhanbad.	2,67,000
144	New Pure Jharia (J-124)	Post Office Jharia	D.D. Thacker and Sons, Dhanbad.	10,000
145	Pure Jharia (J-127)			
146	K. P. Dobari (J-128)	Post Office Jharia	K. P. Dobari, Post Office Jharia.	54,300
147	South Jharia (J-129)	Post Office Jharia	J. K. Banerjee and Others, Post Box No. 46, Hirapur, District Dhanbad.	1,45,800
148	Model Jharia (J-133)			
149	East Pure Jharia (J-130)	Post Office Jharia	Owner not known.	5,000
150	Dobar (J-131)	Post Office Jharia	R. N. Bagchi and Brothers, 5/8, Middle Row, Calcutta.	3,42,300
151	East Model Jharia (J-132)	Post Office Jharia	Not available.	5,000
152	Golden Jharia (J-134)	Post Office Jharia	Khora Ramji, Post Office Jharia, Dhanbad.	5,000
153	Fatehpur (J-135)	Post Office Jharia	G.K. Dossa and Company, Post Office Jharia, Dhanbad.	5,000
154	Pure Durgapur (J-136)	Post Office Jharia	Pure Durgapur Colliery Company Private Limited, Post Office Jharia, Dhanbad.	5,000
155	Khas Jharia (J-137)	Post Office Jharia	Fularibad Colliery Company, Post Office Jharia, Dhanbad.	5,000
156	Ganhoodih (J-139)	Post Office Jharia	S. B. Banerjee and Sons, Post Office Jharia, Dhanbad.	27,52,000
157	East Jharia (J-140)	Post Office Jharia	Not available.	5,000
158	K. P. Kujama (J-141)	Post Office Jharia	Jayantilal Keshavji Bale, Dave House, Joraphatak, Post Office Dhansar, Dhanbad.	96,800
159	Kujama (J-142)			

Sl. No.	Name of the mine	Location of the mine	Name and address of the owners of the mine	Amount (in rupees)
1	2	3	4	5
160	North Kujama (J-144)	Post Office Jharia	Ganji Dossa and Company, Post Office Jharia, Dhanbad.	63,500
161	Central Kujama (J-144)	Post Office Jharia	Central Kujama Coal Concern, Post Office Jharia, Dhanbad.	5,26,000
162	Nanji Kujama (J-145)			
163	Pandebera (J-146)			
164	Pure Kujama (J-147)			
165	Kujama Pandebera (J-148)			
166	South Kujama (J-149)	Post Office Jharia	Bagdigi Kujama Collieries Company (1946) Limited, Post Office Jharia, Dhanbad.	25,84,000
167	Goluckdih (J-150)	Post Office Jharia	Goluckdih Colliery Company, 22, Bartolla Street, Calcutta.	13,96000
168	South Goluckdih (J-151)	Post Office Jharia	Messrs. Khimji Dossa and Sons, Post Office Jharia, Dhanbad. and South Goluckdih Coal Company, Post Office Jharia, Dhanbad.	8,78,000
169	Central Jharia (J-152)			
170	Indian Jharia (J-153)			
171	Lower Upper Jharia (J-154)	Post Office Jharia	Khimji Dossa & Sons, Post Office Jharia, Dhanbad.	1,33,300
172	Central Tisra (J-155)	Post Office Jharia	Shri K. D. Singh, Post Office Jharia, Post Box No. 111, Dhanbad.	2,71,000
173	Tisra (D.D.) (J-156)	Post Office Jharia	Dhanji Devji and Sons, Post Office, Jharia, Dhanbad.	2,72,800
174	Tisra (Diamond) (J-157)	Post Office Jharia	The Diamind Coal Compnay Limited, Post Office Jharia. Dhanbad.	2,56,000
175	Tisra (A.G.) (J-158)	Post Office Jharia	Amarsing Gowamal & Sons, Post Box No. 47, Jharia, Dhanbad.	3,38,500
176	Sree Commercial (J-159)	Post Office South Tisra	Bengal Jharia Colliery Company Private Limited, Post Office South Tisra, Dhanbad.	8,50,000
177	Bengal Jharia (J-160)			
178	East India (J-161)			
179	Khas Joyrampur (J-163)	Post Office Khas Jeenagora.	Khas Joyrampur Colliery Company, Post Office Khas Jeenagora, Dhanbad.	31,51,000
180	Lower Joyrampur (J-165)			
181	Pure Joyrampur (J-169)			
182	South Tisra (J-162)	Post Office Tisrh	South Tisra Colliery Company Private Limited, Post Office Jharia, Dhanbad.	6,68,000
183	Kalithan Jeenagora (J-164)	Post Office Khas Jeenagora.	K.B. Seal and Sons. 28, Raja K. L. Gpswami Street, Post Office Serampur. District Hooghly (West Bengal).	4,42,500
184	Kalithan Suratand (J-175)	Post Office Jharia		
185	New Jeenagora (J-166)	Post Office Khas Jeenagora.	Khas Jeenagora Colliery Limited, 135, Biplabi Rash Bihari Basu Road, Calcutta-1.	8,99,000
186	Central Jeenagora (J-167)			
187	North Bararee Jeenagora (J-170)			
188	Khas Jeenagora (J-171)			
189	Sri Jeenagora (J-173)			
190	East Bararee (J-172)	Post Office Khas Jeenagora.	Jeenagora East Bararee Colliery Company, Post Office Khas Jeenagora, Dhanbad.	3,05,500
191	New Suratand (J-174)	Post Office Jharia	Not available.	5,000

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Sl. No.	Name of the mine	Location of the mine	Name and address of the owners of the mine	Amount (in rupees)
1	2	3	4	5
192	Nilari Patra (J-176)	Post Office Jharia	Nilari Patra Coal Company Limited, Post Office Jharia, Dhanbad.	5,000
193	North Burrakar Suratand (J-177)	Post Office Jharia	The New Standard Coal Company (Private) Limited, 27, Palace Court, 1, Kyd. Street, Calcutta-16.	1,42,500
194	North Burrakar Lodna (J-178)			
195	Lodna (J-179)			
196	Standard (J-180)	Post Office Bhaga	Standard Coal Company, Post Office Bhaga, Dhanbad.	24,800
197	Lodna (J-181)	Post Office Jheria	Lodna Colliery Company (1920) Limited, 6, Lyons Range, Calcutta.	81,80,000
198	Madhuban Lodna (J-182)	Post Office Jharia		
199	Begdigi (J-183)			
200	Bhulanbararee (J-186)	Post Office Patherdih	Bhulanbararee Coal Company, 4, Clive, Row, Calcutta-1.	15,13,300
201	Lachmi (J-187)	Post Office Patherdih	Lachmi Coal Company, 31 Mullick Street, Calcutta.	76,500
202	Central Bhowrah (J-192)	Post Office Bhowrah	Central Bhowrah Coal Company, Post Office Jharia, Dhanbad.	9,000
203	Sitanala (J-193)	Post Office Bhojudih	Mohatta Brothers, 19, British Indian Street, Calcutta-1.	6,300
204	East Bhowra (J-194)	Post Office Patherdih	Shrimati Jyotsna Devi, Post Office Sitarampur, District Burdwan.	3,11,000
205	East Sowardih (J-195)	Post Office Patherdih	J.N. Supakar Brothers and Company, Post Office Patherdih, Dhanbad.	1,000
206	Patherdih (J-196)	Post Office Patherdih	Patherdih Sudamdih Colliery (Private) Limited, Post Office Patherdih, Dhanbad.	56,500
207	New Sudamdih (J-197)	Post Office Patherdih	New Sudamdih Colliery Company, Post Office Patherdih, Dhanbad.	1,97,000
208	Selected Patherdih (J-198)	Post Office Patherdih	Selected Patherdih Coal Company Limited, 12, Tarachand Dutta Street, Calcutta-1.	13,000
209	New Chasnalla (J-199)	Post Office Jharia	New Chasnalla Coal Concern, Post Office Jharia, Dhanbad.	5,000
210	Pure Chasnalla (J-200)	Post Office Patherdih	Pure Chasnalla Colliery Company 192, Cross Street, Calcutta-7.	49,800
211	Junkundar (R-1)	Post Office Chirkunda, District Dhanbad.	D. Mondal and Company Limited, Post Office Dishergarh, District Burdwan, West Bengal.	1,56,000
212	Laikdih Deep (R-2)	Post Office Chirkunda, District Dhanbad.	Katras-Jharia Coal Company Limited, 8, Clive Row, Calcutta-1.	16,83,000
213	Victoria (R-4)	Post Office Kulti, District Burdwan.	New Birbhoom Coal Company Limited, 8, Clive Row, Calcutta-1.	23,83,300
214	Victoria West (R-5)			

NOTE :—The number specified, in brackets, against the name specified in the second column indicates the corresponding serial number of the coking coal mine in the First Schedule to the Coking Coal Mines (Emergency Provisions) Act, 1971 (64 of 1971). The abbreviations "EB" stand for "East Bokaro Coalfield", "J" stands for Jharia Coalfield; and "R" stand for "Raneegunge Coalfield."

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Sl. No.	Name of the mine	Location of the mine	Name and address of the owners of the mine	Amount (in rupees)
1	2	3	4	5
192	Niluri Patra (J-178)	Post Office Jharia	Niluri Patra Coal Company Limited, Post Office Jharia, Dhanbad.	5,000
193	North Butrakar Suratand (J-177)	Post Office Jharia	The New Standard Coal Company (Private) Limited, 27, Palace Court, 1, Kyd. Street, Calcutta-16.	1,12,500
194	North Butrakar Lodna(J-178)			
195	Lodna (J-179)			
196	Standard (J-180)	Post Office Bhaga	Standard Coal Company, Post Office Bhaga, Dhanbad.	24,800
197	Lodna (J--181)	Post Office Jheria	Lodna Colliery Company (1920) Limited, 6, Lyons Range, Calcutta.	81,80,000
198	Madhuban Lodna (J-182)	Post Office Jharia		
199	Begdigi (J-183)			
200	Bhulanbararee (J-186)	Post Office Patherdih	Bhulanbararee Coal Company, 4, Clive, Row, Calcutta-1.	15,13,300
201	Lachmi (J-187)	Post Office Patherdih	Lachmi Coal Company, 31 Mullick Street, Calcutta.	76,500
202	Central Bhowrah (J-192)	Post Office Bhowrah	Central Bhowrah Coal Company, Post Office Jharia, Dhanbad.	6,000
203	Sitanala (J-193)	Post Office Bhojudih	Mohatta Brothers, 19, British Indian Street, Calcutta-1.	6,300
204	East Bhowra (J-194)	Post Office Patherdih	Shrimati Jyotsna Devi, Post Office Sitarampur, District Burdwan.	3,4 ,000
205	East Sowardth (J-195)	Post Office Patherdih	J.N. Supakar Brothers and Company, Post Office Patherdih, Dhanbad.	3,000
206	Patherdih (J-196)	Post Office Patherdih	Patherdih Sudamdih Colliery (Private) Limited, Post Office Patherdih, Dhanbad.	5 ,500
207	New Sudamdih (J-197)	Post Office Patherdih	New Sudamdih Colliery Company, Post Office Patherdih, Dhanbad.	1,0 ,000
208	Selected Patherdih (J-198)	Post Office Patherdih	Selected Patherdih Coal Company Limited, 12, Tarachand Dutta Street, Calcutta-1.	13,000
209	New Chasnalla (J-199)	Post Office Jharia	New Chasnalla Coal Concern, Post Office Jharia, Dhanbad.	5,000
210	Pure Chasnalla (J-200)	Post Office Patherdih	Pure Chasnalla Colliery Company 192, Cross Street, Calcutta-7.	49,800
211	Junkundar (R-1)	Post Office Chirkunda, District Dhanbad.	D. Mondal and Company Limited, Post Office Dishergarh, District Burdwan, West Bengal.	1,56,000
212	Laikdih Deep (R-2)	Post Office Chirkunda, District Dhanbad.	Katras-Jharia Coal Company Limited, 8, Clive Row, Calcutta-1.	16,53,000
213	Victoria (R-4)	Post Office Kulti, District Burdwan.	New Birbhoom Coal Company Limited, 8, Clive Row, Calcutta-1.	23,39,800
214	Victoria West (R-5)			

NOTE :—The number specified, in brackets, against the name specified in the second column indicates the corresponding serial number of the coking coal mine in the First Schedule to the Coking Coal Mines (Emergency Provisions) Act, 1971 (64 of 1971). The abbreviations "EB" stand for "East Bokaro Coalfield", "J" stands for Jharia Coalfield; and "R" stand for "Raneegunge Coalfield."

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THE SECOND SCHEDULE

(*See* sections 5 and 11)

Sl. No.	Name of the coke oven plant	Location of the coke oven plant	Name and address of the owners of the coke oven plant	Amount (in rupees)
1	2	3	4	5
1.	Bararee Coke Plant . . .	South Balliary-Kendwadih Colliery, Post Office Kusunda, District Dhanbad.	Bararee Coke Company Limited, 4, Clive Row, Calcutta—1.	21,42,000
2.	Bhowra Coke Plant . . .	Bhowra South Colliery, Post Office Bhowra, District Dhanbad.	Messrs. Bhowra Coke Company, Battachary's House Lubi Circular Road, Dhanbad.	11,76,500
3.	Bhulanbararee . . .	Bhulanbararee Colliery, Post Office Patherdih, District Dhanbad.	Bararee Coke Company Limited, 4, Civil Row, Calcutta-1.	2,03,500
4.	Central Bhowra . . .	Central Bhowra Colliery, Post Office Bhowra, District Dhanbad.	Central Bhowra Coal Company (Private) Limited, Post Office Jharia; and G.D. Kumar and Sons, Bastacolla, Post Office Dhansar, Dhanbad.	2,98,000
5.	Central Kooridih . . .	Central Kooridih-Sonardih Colliery, Post Office Katrasgarh, Dhanbad.	Shivram Singh and Company (Private) Limited, Post Office Katrasgarh, District Dhanbad.	1,50,000
6.	Junkundar Valley Beehive Coke Plant.	Junkundar Colliery, Post Office Chirkunda, District Dhanbad.	D. Mondal and CompanyLimited Panchayat Road, Post Office Chirkunda, District Dhanbad.	1,68,800
7.	New Gobindpur . . .	New Gobindpur Colliery, Post Office Sonardih, District Dhanbad.	Ghosh's Estate Private Limited, 33, Canning Street, Calcutta-1.	1,12,500
8.	New Standard Loda . .	New Standard Lodna Colliery, Post Office Jharia, District Dhanbad.	Messrs. Singh Sachdeva, , Post Office Dhansar, Dhanbad.	1,05,000
9.	New Sudamdih . . .	New Sudamdih Colliery, Post Office Patherdih, District Dhanbad.	Sanjive Coke Manufacturing Company, C/o H.D. Adjmera, Post Office Patherdih, Dhanbad.	3,21,000
10.	North Kujama . . .	North Kujama Colliery, Post Office Jharia, District Dhanbad.	Beehive Hard Coke Manufacturing Company, Chowra Construction Company Private Limited, 111, Central Avenue, Calcutta.	2,57,500
11.	Ramkanaly . . .	Ramkanaly Colliery , Post Office Katrasgarh, District Dhanbad.	Bijali Kanti Roy, Keshalpur House, Post Office, Katrasgarh, Dhanbad and M. C. Coal Company, Post Office Jharia, Dhanbad.	2,02,000
12.	Union Angarpathra . . .	Union Angarpathra Colliery, Post Office Katrasgarh, District Dhanbad.	Satyadeo Singh Coal Company (Private) Limited, 138, Biplabi Rash Bihari Basu Road, Calcutta—1.	1,84,000

K. K. SUNDARAM,
Joint Secy. to the Govt. of India.

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भारत का राजपत्र
The Gazette of India

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PART II — Section 1
प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

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No. 59] NEW DELHI, FRIDAY, DECEMBER 8, 2000 / AGRAHAYANA 17, 1922

इस भाग में भिन्न पृष्ठ संख्या दी जाती है जिससे कि यह अलग संकलन के रूप में रखा जा सके।
Separate paging is given to this Part in order that it may be filed as a separate compilation.

MINISTRY OF LAW, JUSTICE AND COMPANY AFFAIRS

(Legislative Department)

New Delhi, the 8th December, 2000/Agrahayana 17, 1922 (Saka)

The following Act of Parliament received the assent of the President on the 8th December, 2000, and is hereby published for general information:—

THE COAL INDIA (REGULATION OF TRANSFERS AND VALIDATION) ACT, 2000

No. 45 OF 2000

[*8th December, 2000*]

An Act to empower the Central Government to direct the transfer of the land, or of the rights in or over land or of the right, title and interest in relation to a coal mine, coking coal mine or coke oven plant, vested in the Coal India Limited or in a subsidiary company to any subsidiary company of Coal India Limited or any other subsidiary company and to validate certain transfers of such land or rights.

BE it enacted by Parliament in the Fifty-first Year of the Republic of India as follows:—

Short title.

1. This Act may be called the Coal India (Regulation of Transfers and Validation) Act, 2000.

Definitions.

2. In this Act, unless the context otherwise requires,—

1 of 1956.

(*a*) "Coal India" means the Coal India Limited, a Government company incorporated under the Companies Act, 1956 having its registered office at Calcutta and includes its predecessor Government company, namely, the Coal Mines Authority Limited;

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Project Officer
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(*b*) "subsidiary company" means the following subsidiary companies of Coal India, namely:—

(*i*) the Central Coal Fields Limited, Ranchi and includes its predecessor Government company, namely, the National Coal Development Corporation Limited, Ranchi;

(*ii*) the Bharat Coking Coal Limited, Dhanbad;

(*iii*) the Western Coal Fields Limited, Nagpur;

(*iv*) the Eastern Coal Fields Limited, Sanctoria;

(*v*) the Central Mine Planning and Design Institute Limited, Ranchi;

(*vi*) the South-Eastern Coal Fields Limited, Bilaspur;

(*vii*) the Northern Coal Fields Limited, Singrauli;

(*viii*) the Mahanadi Coal Fields Limited, Sambalpur.

and includes such other subsidiary company of Coal India as may be incorporated under the Companies Act, 1956 from time to time; 1 of 1956.

(*c*) words and expressions used herein and not defined but defined in the Coking Coal Mines (Nationalisation) Act, 1972 or the Coal Mines (Nationalisation) Act, 1973, shall have the meanings, respectively, assigned to them in those Acts. 36 of 1972. 26 of 1973.

Power of Central Government to direct transfer of land, rights, title or interest.

3. (*1*) Notwithstanding anything contained in any other law for the time being in force, the Central Government may, if it is satisfied that a subsidiary company is willing to comply, or has complied, with such terms and conditions as that Government may think fit to impose, direct, by notification in the Official Gazette, that the land or rights in or over such land or the right, title and interest in relation to a coal mine, coking coal mine or a coke oven plant vested in the Coal India shall, instead of continuing to vest in the Coal India, vest in that subsidiary company or, where such land or right, title or interest vests in a subsidiary company, in another subsidiary company.

(2) Where the land or rights in or over such land or the right, title and interest in relation to a coal mine, coking coal mine or a coke oven plant vest in a subsidiary company under sub-section (*1*), such subsidiary company shall, on and from the date of such vesting, be deemed to have become the lessee in relation to such coal mine or coking coal mine as if a fresh mining lease in relation to such coal mine or coking coal mine had been granted to it under the Mineral Concession Rules, 1960 made under section 13 of the Mines and Minerals (Development and Regulation) Act, 1957 for the maximum period for which such lease could have been granted under those rules, and all the rights and liabilities of Coal India or, as the case may be, the subsidiary company in relation to such coal mine or coking coal mine shall, on and from the date of such vesting, be deemed to have become the rights and liabilities, respectively, of subsidiary company first-mentioned. 67 of 1957.

Validation of certain transfers.

4. A subsidiary company which was operating, or was in control of, any coal mine, coking coal mine, or coke oven plant which was vested in the Coal India or any other subsidiary company immediately before the commencement of this Act, shall be deemed to have been vested with the land or rights in or over such land or the right, title and interest in relation to such coal mine, coking coal mine or coke oven plant and such vesting shall be deemed to have been valid and effective at all material times as if a direction had been made by the Central Government under sub-section (*1*) of section 3 and accordingly no

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suit or other proceeding shall be instituted, maintained or continued in any court on the ground that such subsidiary company was not competent to operate or control such coal mine, coking coal mine or coke oven plant.

SUBHASH C. JAIN,
Secy. to the Govt. of India.

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Ref. No. CIL : Legal: 1161

Date : 19.08.2015

The HOD (Legal)
ECL / BCCL / CCL / SECL / MCL /
NCL / WCL / CMPDIL

General Manager
N.E.C., CIL

Dear Sirs,

Sub :- **Opinion of Sri Kaushik Chanda, Additional Solicitor General for India on the issue of Renewal of Mining Leases which had been in the control of Coal India subsidiaries by virtue of the Coal Mines Nationalisation Acts 1972 / 1973**

BCCL was being goaded by the Government of Jharkhand since long for getting the mining leases, that had come to its control since nationalisation, renewed according to the provisions of Mineral Concessional Rules, 1960 since, according to the said State Government, the vested leases stood expired with the expiry of 30 years from the date(s) of Nationalisation.

BCCL referred the issue to CIL for ascertaining the legal position. The matter was deliberated upon at different levels. Finally, the matter was referred to Sri Kaushik Chanda, Additional Solicitor General for India for legal opinion.

The above named learned Solicitor General by his opinion dated 23rd July 2015 has clarified that the aforesaid leases supposed to have expired in 2002 (Coking Coal Mining Leases) and 2007 (Non-Coking Coal Mining Leases) have not in fact expired by reason of enactment of the Coal [illegible] and Validation [illegible]

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Kausik Chanda

भारत

OF INDIA

Office

been granted under Section 4 of the Coal India (Regulation of Transfer and Validation) Act, 2000?

4. Generally as to the case.

The backdrop of the case in short may be summarised as follows:

The Mines and Minerals (Development & Regulations) Act, 1957 was enacted to provide for the development and regulations of mines and minerals under the control of the Union.

As per Section 8 of the said Act mining lease could be granted for a maximum period of 30 years.

By virtue of the Coking Coal Mines (Nationalisation) Act, 1972) and the Coal Mines (Nationalisation) Act, 1973) the coal mines industries were taken over from the private coal mines owners and the same stood vested in Central Government.

Subsequently, Central Government by different notifications directed vesting of all rights in the existing mining leases in favour of Coal Mine Authority Limited which was subsequently renamed as Coal India Limited.

Coal India Limited used to carry out the mining activities through its subsidiary companies located in the different states. Bharat Coking Coal Limited is a subsidiary company of Coal India Ltd.

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Kausik Chanda

महा सॉलिसिटर

भारत

ADDITIONAL SOLICITOR GENERAL

OF INDIA

Office

Calcutta High Court

Tel Fax 033 2248 1950

Mobile 98310818

OPINION

Ex-parte: Coal India Limited

Re. Opinion on renewal of mining leases by Bharat Coking Coal Limited vested with it through Coal India Limited by virtue of the Coking Coal Mines (Nationalization) Act, 1972 and the Coal Mines (Nationalization) Act, 1973.

The following questions have been formulated by the querist for answer.

Questions

1. Whether CIL and/or its subsidiary BCCL having not yet obtained the renewal of lease and/or fresh lease is mining without authority of law or legal sanction?
2. Whether Section 4 of the Coal India (Regulation of Transfer and Validation) Act, 2000 has granted fresh leases in favour of CIL and/or its subsidiary BCCL for the maximum period for which fresh lease could have been granted under the Rule of 1960 i.e. till 7th December 2030?
3. Whether authorization under Section 31 of the Mines and Minerals (Development and Regulation) Act, 1957 is required if fresh lease has

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Calcutta High Court
033-2248
9831081

been granted under Section 4 of the Coal India (Regulation of Transfer and Validation) Act, 2000?

4. Generally as to the case.

The backdrop of the case in short may be summarised as follows:

The Mines and Minerals (Development & Regulation) Act, 1957 was enacted to provide for the development and regulations of mines and minerals under the control of the Union.

As per Section 8 of the said Act mining lease could be granted for a maximum period of 30 years.

By virtue of the Coking Coal Mines (Nationalisation) Act, 1972) and the Coal Mines (Nationalisation) Act, 1973) the coal mines industries were taken over from the private coal mines owners and the same stood vested in Central Government.

Subsequently, Central Government by different notifications directed vesting of all rights in the existing mining leases in favour of Coal Mine Authority Limited which was subsequently renamed as Coal India Limited.

Coal India Limited used to carry out the mining activities through its subsidiary companies located at the different states. Bharat Coking Coal Limited is a subsidiary company of Coal India Ltd.

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कौशिक [illegible]
Kaushik [illegible]

[illegible] महा- [illegible]
भारत

[illegible]ONAL SOLICI[illegible] [illegible]RAL
OF INDIA
Office
[illegible] Calcutta H[illegible]
Tel /Fax 033 22[illegible]
Mobile - 9831[illegible]

As the maximum lease period was 30 years, the mining leases under the con[illegible]
of Coal India Limited and its subsidiaries in respect of coking coal was due to
expire in 2000 and in case of non coking coal it was due to expire in the [illegible]
2003

The BCCL applied for the renewal of lease in terms of the Mine[illegible]
Concessional Rules, 1960 only in the year 2005. Series of correspondence [illegible]
made with the concerned authorities for such renewal but as on date the [illegible]
has not been renewed.

In the meantime the Coal India (Regulation of Transferred Validation) Act,
2000 (hereinafter referred to as the "said act") came into operation with [illegible]
from December 08, 2000.

The answers to the queries raised require to be traced out from the impor[illegible] the
said act.

Section 3 & 4 of the said Act is set out hereunder:

3.(1) Notwithstanding anything contained in any other law for the time being in force, the Central Government may, if it is satisfied that a subsidiary company is willing to comply, or has complied, with such terms and conditions as that Government may think fit to impose, by notification in the Official Gazette, that the land or rights in or over such land or the right, title and interest in relation to al coal mine, coking coal mine or a coke oven plant vested in the Coal India shall, instead of

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Mobile : 98310818..

intending to vest in the Coal India, I vest in that subsidiary company or, where such land or right, title or interest vests in a subsidiary company, in another subsidiary company.

3(2) Where the land or rights in or over such land or the right, title and interest in relation to a coal mine, coking coal mine or a coke oven plant vest in a subsidiary company under sub-section (1), such subsidiary company shall, on and from the date of such vesting be deemed to have become the lessee in relation to such coal mine or coking coal mine had been granted to it under the Mineral Concession Rules, 1960 made under section 13 of the Mines and Minerals (Development and Regulation) Act, 1957 for the maximum period for which such lease could have been granted under those rules, and all the rights and liabilities of Coal India or, as the case may be, the subsidiary company in relation to such coal mine or coking coal mine shall, on and from the date of such vesting, be deemed to have become the rights and liabilities, respectively, of the subsidiary company first-mentioned.

4 A subsidiary company which was operating, or was in control of, any coal mine, coking coal mine, or coke oven plant which was vested in the Coal India or any other subsidiary company immediately before the commencement of this Act, shall be deemed to have been vested with the land or rights in or over such land or the right, title and interest in relation to such coal mine, coking coal mine or coke oven plant and such

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vesting shall be deemed to have been valid and effective at all material times as if a direction had been made by the Central Government under sub-section (1) of section 3 and accordingly no suit or other proceeding shall be instituted, maintained or continued in any court on the ground that such subsidiary company was not competent to operate or control such coal mine, coking coal mine or coke oven plant.

The above said two sections are incorporated with two folds object –

(a) to empower Central Government to a fresh transfer rights/interests in relation to a Coal Mine to a subsidiary company by notification in Official Gazette [Section 3(1)] and

(b) to validate transfer rights or interests in relation to a Coal Mine by a deeming provision in favour of a subsidiary company which was operating in or was in control of any Coal Mine vested in Coal India before the commencement of the said act (Section 4).

Section 3(2) of the said Act deals with the period of lease which says that from and from the date of vesting the subsidiary company shall be deemed to have become lessee as if a fresh mining lease has been granted to it under Mineral Concession Rules, 1960 for a maximum period . It may be reiterated that in the present case the said maximum period is 30 years by virtue of Section 8 of Mines and Minerals (Development & Regulations) Act, 1957

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Project Officer
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ADDITIONAL SOLICITOR GENERAL
OF INDIA

...period as mentioned in Section 3(2) of the said Act is also applicable to ... covered under Section 4 of the said Act.

... being a subsidiary company which was operating and in control of ... before the commencement of the said act is to be covered under ... of the said Act.

... BCCL, by virtue of the Section 4 of the said Act read with Section ... said Act shall be deemed to have been granted a fresh lease for a ... years from the date of commencement of the said Act i.e. ... 8, 2000.

... of the aforesaid the application for renewal of lease made by the BCCL ... the year 2005 and the steps taken in furtherance thereafter becomes ... consequential as the tenure of the lease has further been automatically ... operation of the said act.

... of the discussion ~~of the~~ aforesaid, my answers are as follows:

Question No.1 is answered in negative.

Question No.2 is answered in affirmative.

Question No.3 is answered in negative.

(Kausik Chanda)
Additional Solicitor General of India

Dated 23rd July, 2015

परियोजना पदाधिकारी
Project Officer
कुईयाँ कोलियरी
Kuya Colliery

6. उत्पादन-शून्य उत्पादन में घटने बढ़ने का कारण दें, यदि कोई हो, वर्ष के दौरान पिछले वर्ष की तुलना में।

क) .....

ख).....

7. पूर्व खान मूल्य वार श्रेणी में घटने बढ़ने का कारण दें, यदि कोई हो, वर्ष के दौरान पिछले वर्ष की तुलना में।

क) .....

ख).....

स्थान ..... **हस्ताक्षर** .....

तारीख ..... पूरा नाम .....

पदनाम: स्वामी /अभिकर्ता /खान इंजीनियर/प्रबंधक।"

[फा. सं. 12012/2/2021-पी एम 1]

बी.पी. पति, संयुक्त सचिव

टिप्पणी : मूल नियम दिनांक 23 नवंबर, 1960 की संख्या जी.एस.आर. 1398 के माध्यम से भारत के राजपत्र, भाग II, खंड 3, उप-खंड (i) में प्रकाशित किए थे और दिनांक 29 मई, 2020 की संख्या जी.एस.आर. 331(अ) के जरिए अंतिम बार संशोधित किए गए थे।

स्पष्टीकारक ज्ञापन :

केन्द्रीय सरकार, खान और खनिज (विकास और विनियमन) संशोधन अधिनियम, 2021 (2021 का 16) के माध्यम से अंतःस्थापित खान और खनिज (विकास और विनियमन) अधिनियम, 1957 की धारा 8 की उपधारा (4) को तदनुसार विद्यमान खान के पट्टों की अवधि को विहित करने के लिए सरकारी कंपनी या निगम के मामलों में खान के पट्टों की अवधि को विस्तार करने के लिए सशक्त करती है, विद्यमान पट्टों की अवधि को नियम 24ग की उपधारा (2) में विहित किया गया है और खान के पट्टों के नवीकरण के लिए लंबित आवेदनों को नियम 24ग के उपनियम (5) में खान के पट्टों की अवधि के विस्तार के लिए किया गया आवेदन समझा जाएगा। यह प्रमाणित किया जाता है कि किसी भी व्यक्ति पर इन नियमों के माध्यम से भूतलक्षी प्रभाव देने से प्रतिकूल प्रभाव नहीं पड़ेगा।

MINISTRY OF COAL

NOTIFICATION

New Delhi, the 1st October, 2021

G.S.R. 717(E).—In exercise of powers conferred by Section 13 of the Mines and Minerals Development and Regulation) Act, 1957 (67 of 1957), the Central Government hereby makes the following rules further to amend the Mineral Concession Rules, 1960, namely:-

1. Short title and commencement.—(1) These rules may be called the Mineral Concession (Amendment) Rules, 2021.

(2) Save as otherwise provided in these rules they shall come into force on the date of their publication in Gazette of India.

2. In the Mineral Concession Rules, 1960, (hereinafter referred to as the principal rules),in rule 2, in sub-rule (1), after clause (vii),the following clause shall be inserted, namely:-

'(viia) "run-of-mine" means the raw, unprocessed or uncrushed material in its natural state obtained after blasting, digging, cutting or scraping from the mineralised zone of a lease area;'.

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Project Officer
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Kuya Colliery

3. In the principal rules, after rule 24B the following rule shall be inserted, namely:-

"24C. Period of mining lease granted to Government companies or corporations.—

(1) All mining leases granted on or after the commencement of the Mineral Concession (Amendment) Rules, 2021 to a Government company or corporation for coal or lignite shall be for a period of fifty years.

(2) All subsisting mining leases vested or granted to a Government company or corporation before commencement of the Mineral Concession (Amendment) Rules, 2021 for coal or lignite shall be deemed to have been granted for fifty years or till 31st March 2030, whichever is later.

(3) The State Government, upon an application made to it in this behalf by the Government company or corporation at least three months prior to the expiry of the mining lease, shall extend the period of the mining lease for a further period of twenty years at a time:

Provided that the State Government may condone the delay in application for extension made after the prescribed time limit:

Provided further that no extension of period of mining lease shall be granted to a Government company or corporation that has been selected through auction.

(4) If an application for extension of mining lease made within the time mentioned in sub-rule (3) is not disposed of by the State Government before the date of expiry of the lease, the period of that lease shall be deemed to have been extended till the State Government passes an order on the same.

(5) All applications made by a Government company or corporation for renewal of mining lease which were pending as on the date of commencement of the Mines and Minerals (Development and Regulation) Amendment Act, 2021 (16 of 2021) shall be deemed to be applications for extension of the period of the mining lease and shall be disposed of in accordance with the provisions of sub-rule (3).".

4. In the principal rules, after rule 27, the following rule shall be inserted, namely:-

"27A. Manner of sale of coal or lignite by the lessee of a captive mine.— (1)Any lessee may, where coal or lignite is used for captive purpose, sell coal or lignite up to such per cent. of the total coal or lignite produced in a financial year, as allowed under sub-section (5) of section 8, after meeting the requirement of the end use plant linked with the mine.

Explanation 1.- For the purpose of this rule it is clarified that the requirement of the end use plant linked with the mine for a financial year shall be the actual quantity of coal or lignite consumed in the said plant in that financial year or a part thereof.

Explanation 2.- For the purpose of this rule, quantity of coal or lignite produced, sold, utilised in linked end-use plant and the payment of additional amount on the quantity sold shall be assessed on run-of-mine basis.

Explanation 3.-Sale of any tailings, rejects or middlings shall not be restricted by this rule.

(2) For the quantity of coal or lignite sold in accordance with sub-section (5) of section 8, the lessee shall pay to the State Government, at the time of payment of royalty, an additional amount as specified in the Sixth Schedule of the Act, which shall be in addition to royalty or payment to the District Mineral Foundation and National Mineral Exploration Trust or any other statutory payment or payment specified in the tender document or the auction premium, wherever applicable.

(3) Within one month of the end of a financial year, for sale made in the previous financial year, the lessee shall submit to the Nominated Authority, Ministry of Coal, Coal Controller's Organisation and to the State Government, a self-declaration in Form R.

(4) Sale of coal shall not be allowed from the coal mines allotted to a company or corporation that has been awarded a power project on the basis of competitive bid for tariff (including Ultra Mega Power Projects)."

Explanation.-For the purpose of this rule, it is clarified that the provision for sale of coal or lignite as prescribed in this rule shall not affect the eligibility conditions and efficiency parameters prescribed in the respective agreements entered into by the lessee with the Central Government.

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Project Officer
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5. In the principal rules, for rule 28, the following rule shall be substituted, namely:-

"28. Lapsing of Leases. — (1) Where production and dispatch has not commenced within a period of two years from the date of execution of the mining lease or is discontinued for a continuous period of two years after commencement of production or dispatch, the mining lease shall lapse on the expiry of the period of two years from the date of execution of the lease or as the case may be, discontinuance of the production and dispatch.

(2) The lapsing of the mining lease shall be recorded through an order issued by the State Government and shall also be communicated to the lessee.

(3) Where a lessee is unable to commence the production and dispatch within a period of two years from the date of execution of the mining lease or discontinuation of production and dispatch for reasons beyond his control, he may submit an application to the State Government, requesting for an extension of such period of two years by a further period not exceeding one year, explaining the reasons for the same, at least three months before the expiry of such period of two years:

Provided where the lessee has failed to make the application within the time stipulated above, the lease shall lapse on expiry of the period of two years.

(4) Application made under sub-rule (3) shall specify—

(a) the reasons on account of which it will not be possible for the lessee to undertake mining operations or continue production and dispatch;

(b) the manner in which such reasons are beyond the control of the lessee;

(c) the steps that have been taken by the lessee to mitigate the impact of such reasons; and

(d) the period of extension sought.

(5) Every application under sub-rule (3) shall be accompanied by a fee of two hundred rupees.

(6) The State Government shall, after examining the application, pass an order, within a period of three months from the date of receipt of the application made under sub-rule (3) or the date on which the mining lease would have otherwise lapsed, whichever is earlier, either granting or rejecting such request:

Provided that such mining lease shall lapse on failure to undertake production and dispatch or inability to continue production and dispatch within the extended period of one year:

Provided further that such extension shall not be granted for more than once during the entire period of lease.

(7) The State Government shall communicate to the Coal Controller's Organisation, Nominated Authority and Ministry of Coal the order recorded under sub-rule (2) or issued under sub-rule (6)within fifteen days of recording or issuing of such order.".

6. In the principal rules, rule 28A shall be omitted.

7. In the principal rules, for rule 64B, the following rule shall be substituted, namely:-

"64B. Charging and instance of payment of royalty in case of minerals subjected to processing.— The royalty shall be charged on run-of-mine coal or lignite irrespective of its processing within or outside the leased area:

Provided that the royalty shall be payable at the time of dispatch from or consumption within the leased area.".

8. In the principal rules, rule 64C shall be omitted.

9. In the principal rules, in Schedule I, after Form Q, the following Form shall be inserted, namely:-

"Form R

(Rule 27A (3))

Self-declaration

For the financial year 1st April 20 _____ to 31st March 20 _____

ANNUAL RETURN

To

(i) The Nominated Authority
Ministry of Coal
Shastri Bhawan, New Delhi

(ii) The Coal Controller
Office of the Coal Controller's Organisation
1, Council House Street,
Lal Dighi, BBD Bagh
Kolkata, West Bengal-700001

(iii) State Government

(PRODUCTION, DISPATCHES AND STOCKS OF COAL/LIGNITE)

(Unit of Quantity in Tonnes)

1. Details of Mine:

(a)	Registration number allotted by Indian Bureau of Mines (to give registration number of the Lessee-Owner)	
(b)	Mine Code (allotted by Indian Bureau of Mines)	
(c)	Name of the Mineral (Coal OR Lignite):	
(d)	Name of Mine	

2. Location of the Mine:

Village	
Post Office	
Tahsil-Taluk	
District	
State	
PIN Code	
Fax No:	E-mail:
Phone No:	Mobile:

3. Name and address of Lessee-Owner (along with fax no. and e-mail):

(a)	Name of Lessee-Owner	
(b)	Address	
(c)	District	
(d)	State	
(e)	PIN Code	

(f)	Fax No.:	E-mail:
(g)	Phone No:	Mobile:
(h)	Registered Office of the Lessee	
(i)	Director in-charge	
(j)	Agent:	
(k)	Manager:	

4. Yearly **Grade-wise Production, EUP Requirement, EUP Utilisation, Sale etc.**

Lignite/ Grades of coal	**Opening stock at pit-head (Carried Forward)**	**Production**	**EUP Requirement**	**EUP Utilisation**	**Quantity Sold**	**Closing stock at pit-head**
Grand Total:						

5. **Sales- Dispatches effected for Domestic Purposes and for Exports**:

Lignite/Grade of coal	Nature of Dispatch *(Indicate whether Domestic Sale or Domestic Transfer or Captive consumption or Export)*	For Domestic Purposes				For export		
		Registration number/ GSTN of the buyer/ consignee ##	Consignee name##	Quantity	Sale value (₹)	Country	Quantity	F.O.B Value (₹)
Grand Total:								

To indicate separately if more than one buyer.

NOTE: - Mine owners are required to substantiate domestic sale value- FOB value for each grade of coal or lignite quoted above with copy of invoices (not to be submitted with the return; to be produced whenever required).

6. **Give reasons for increase-decrease in production-nil production, if any, during the year compared to the previous year.**

a) .....

b) .....

परियोजना पदाधिकारी
Project Officer
कुईयाँ कोलियरी
Kuya Colliery

7. Give reasons for increase-decrease in grade wise ex-mine price, if any, during the year compared to the previous year.

a) .....

b) .....

Place:.....

Date.....

Signature.....

Name in Full.....

Designation: Owner/Agent/Mining Engineer/Manager".

[F. No. 12012/2/2021-PS1]

BHABANI PRASAD PATI, Jt. Secy.

Note : The principal rules were published in the Gazette of India, Part II, Section 3, Sub-section (i) vide number G.S.R. 1398, dated the 23th November, 1960 and lastly amended vide number G.S.R 331(E) dated the 29th May, 2020.

Explanatory Memorandum

Sub-section (4) of Section 8 of the Mines and Minerals (Development and Regulation) Act, 1957inserted through the Mines and Minerals (Development and Regulation) Amendment Act, 2021 (16 of 2021) empowers the Central Government to prescribe the period of existing mining leases and to extend the period of mining leases in case of Government companies or corporations. Accordingly, the period of existing mining leases has been prescribed in sub-rule (2) of rule 24C and the pending applications for renewal of mining leases shall be deemed to be applications for extension of period of mining lease in sub-rule (5) of rule 24C. It is certified that no person is being adversely affected by granting retrospective effect through these rules.

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Annexure – 6

Office of the General Manager, Bastacolla Area, Dhanbad-828111

UNDERTAKING TO BEAR THE COST OF PLANTATION

BCCL undertakes to bear the cost of plantation, if any, for forest land diversion in Kuya Colliery, BCCL.

Project officer
Kuya Colliery

परियोजना पदाधिकारी
Project Officer
कुईयाँ कोलियरी
Kuya Colliery

Annexure - 7

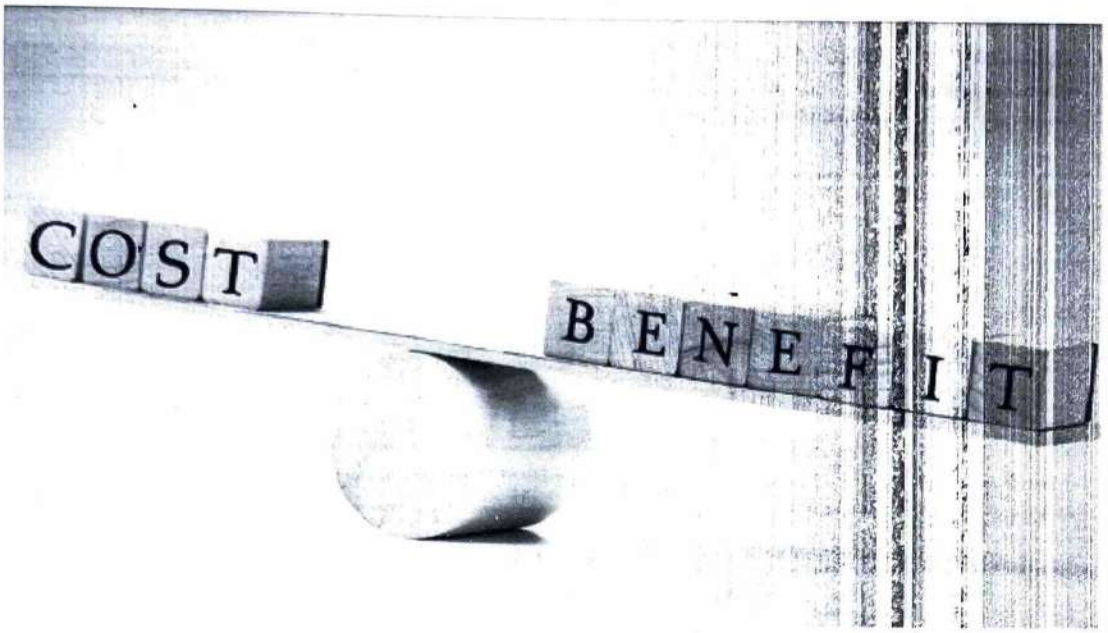
Office of the General Manager, Bastacolla Area, Dhanbad-828111

UNDERTAKING FOR SITE SPECIFIC WILDLIFE/BIODIVERSITY CONSERVATION PLAN

BCCL undertakes to bear the cost for site specific wildlife/Biodiversity conservation plan if any imposed by MOEF&CC, Govt. of India for forest land diversion in Kuya Colliery, BCCL.

Project officer
Kuya Colliery
परियोजना पदाधिकारी
Project Officer
कुईयॉ कोलियरी
Kuya Colliery

Annexure - 8



COST BENEFIT ANALYSIS REPORT

[as per MoEFCC Guideline 7-69/2011-FC(Pt.) dtd. 01 August, 2017]

Bharat Coking Coal Limited
(A Miniratna Company)

Kuya Colliery (16.49 Ha)

परियोजना पदाधिकारी
Project Officer
कुईयाँ कोलियरी
Kuya Colliery

Introduction:

Kuya Colliery is under operation prior to nationalization by ex colliery owners.The Kuya project having leasehold area of the mine is 340.50 Ha of which 117.51 Ha (101.02 Ha already granted) Notified forest land falls in quarriable zone. The application has been done for remaining notified Forest Land i.e. 16.49 Ha. The area is covered under the toposheet no. (F45C5)73 1/5. The Environmental clearance of Kuya colliery granted vide letter no J-11015/298/2010-IA.II(M) in cluster VIII. Exploration for the reserve of coal in the said project was conducted by CMPDI, a subsidiary of coal India ltd. Total coal reserve was found in 19.024MT(Reserve in Forest Land- 2.154MT & Non forest Land- 16.87 MT).

Communication:

Name of Project Officer	:	Devendra Prasad Singh
Address	:	Office of the Project Officer, Kuya Colliery
Mobile no.	:	6287699754
Email Address	:	amenv.bstcla.bccl@coalindia.in

Purpose for Cost benefit analysis :

Cost benefit report is required for making on line application as per part 1,G. The report has been prepared on the basis of MoEFCC circular no.7-69/2011-FC(Pt.)dtd. 01 August, 2017.

Table 1: Breakup of Land(Ha)

Area	Name of Project	Area as per Mine Plan	Total Forest Area in leasehold	Forest Land as per Application	Notified Forest already granted
Bastacolla	Kuya	340.50	117.51	16.49	101.02

The nature of forest land for which application for diversion of forest land to be applied at Kuya Colliery (16.49 Ha) falls in Class III DF forest. As such Rate of NPV comes out as Rs 12,28,590/ Ha for 16.49 Ha of the proposed forest land for diversion.

Table 2: Calculation rate for NPV in respect of Kuya Colliery

Description	Amount in Rs.	Amount in Rs. Lakhs
Total NPV @Rs. 12,28,590 per Ha for 16.49 Ha of the forest land proposed for diversion	12,28,590*16.49 = 2,02,59,449.1/-	202.59
10% NPV Value	20,25,944.91/-	20.259
30% NPV Value	60,77,834.73/-	60.778
50% NPV Value	1,01,29,724.55/-	101.29

Table 3: Rate of land as per circle rate

Name of Village	Forest Land (in Ha)	Circle rate per Decimal (in Rs)
Kuya	16.49 Ha	4,81,866

Total circle rate of 16.49 Ha= **Rs. 19,634.49 Lakhs**

Other conversion factor 100 decimal = 1 acre; 1 Ha = 2.471 Acre = 247.1 Decimal

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CALCULATION AS PER MOEFCC CIRCULAR NO. 7-69/2011-FC(PT.) Ddt. 01 AUGUST, 2017.

I. Estimation of cost for forest diversion

1. Ecosystem services losses due to proposed forest diversion
   Economic value of loss of ecosystem services due to diversion of forest = Net present value (NPV) of the forest land being diverted as per prescribed by the Central Government (MoEF&CC).
   As the Forest land proposed does not fall in National park & Wild life sanctuary
   Ecosystem services losses due to proposed forest diversion for 16.49 Ha = **Rs.** 12,28,590* 16.49 = 202.59 **Lakhs** (Ref Table 2).

2. Loss of animal husbandry productivity, including loss of fodder
   No. of PAFs = 0
   Assuming no. of animal husbandry as 6 Factor = 60
   Loss of animal husbandry productivity, including loss of fodder = 0*6*365*60 = Rs. 0 Lakhs
   10% of NPV = **Rs. 20.259 lakhs** (ref Table 2)
   Since 10% of NPV is more, thus as per guideline
   Loss of animal husbandry productivity, including loss of fodder = **Rs. 20.259 lakhs**

3. Cost of human resettlement as per R&R Plan =**Rs 0 Lakhs**

4. Loss of public facilities and administrative infrastructure (Roads, buildings, schools, dispensaries, electric line, railways, etc.) on forest land, which would require forest land if these facilities were diverted due to the project = **Rs. 0.00**

5. Possession value of forest land diverted
   Amount as per Circle rate of adjoining area= **Rs. 19,634.49 Lakhs** (Ref Table 3)
   30% NPV = **Rs. 60.778 Lakhs** (Ref Table 2)
   Since circle rate of adjoining area is more than NPV paid therefore as per guideline, Possession value of forest land diverted= **Rs 19634.49 Lakhs**

6. Cost of suffering of oustees is Nil as:
   No. Of Outsees = No. of PAFs = Nil

7. Habitat Fragmentation cost
   Cost due to fragmentation has been pegged at 50% of NPV applicable as a thumb rule (Ref Circular MoEF)
   50 % of NPV = **Rs. 101.29 Lakhs** (Ref table 2)

8. Compensatory afforestation and soil & moisture conservation cost: **225.14**
   Rate of Compensatory afforestation = Rs. 350000 / Ha
   Forest land = 16.49 Ha, Therefore CA land= 33 Ha
   Cost of Compensatory Afforestation = **Rs. 115.5 Lakhs**
   Soil Conservation cost =0.5% of the project cost = 0.005 x 4385.67 Lakh = **Rs 21.928 Lakh**
   Cost of Wild life Management Plan= 2% of the project cost=0.02 x 4385.67 Lakh = **Rs 87.713 Lakh**

   Total estimated Cost due to diversion of forest (in Rs. Lakhs) = **20,183.77 Lakhs**

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II. Estimating benefits of forest – diversion in CBA

1. Increase in productively attribute to the specific project
   Productively attribute = Profit per tonne x mineable reserve
   = 723 x 7.783 x10^6 = Rs 56271.09 lakh

2. Benefits to economy due to specific project: **Rs 78101.3098 Lakhs**
   A. CSR cost = 2 % of Profit= 0.02 x Rs 56271.09 Lakh = Rs. 1125.4218 Lakh
   B. Royalty to the exchequer (15% of Sales Value) = Sale price x 7.783 MT x 15 %
   = 2687x7.783x1000000x15/100 = Rs 31369.381 Lakhs
   C. District Mining Fund (DMF) = 30 % of Royalty = Rs. 9410.81 Lakhs
   D. National Mineral fund = 2 % of Royalty = Rs. 627.387 Lakh
   E. Coal Cess/Clean Energy cess =Rs 400/T x 7.783T x 1000000 = Rs. 31132 Lakh
   F. Forest transit fee(Rs 57/tonnee)= Rs 57 x 7.783 x1000000 = 4436.31 Lakh
   Total Benefit= A+B+C+D+E+F = Rs. 78101.3098 Lakhs

3. No. of population benefitted due to specific project
   Direct employment = 836
   Indirect Employment = 250
   Considering avg. family size 5, then no. of Population benefitted = 1086 x 5 = 5430

4. Economic benefits due to direct and indirect employment due to project
   A. For indirect employment generated for= 250 people
   Avg. days of Working (as in Jharkhand) = 200 days
   Rate of unskilled manpower = Rs. 346/- day
   Life of mine = 30 years
   Economic benefits due to indirect employment = Rs. 5190 Lakhs

   B. For direct employment = 836 people(EMS-Rs 5412 /Day)
   Economic benefits due to direct employment = 836x 300 x 30 x 5412 = Rs. 4,07,198.88 Lakhs
   Economic benefits due to of direct and indirect employment due to project =A+B= **Rs. 412388.88 lakhs**

5. Economic benefits due to compensatory afforestation
   CA Land = 16.49 x2 = 33 Ha
   Class of degraded forest land supposed to change from LDF to MDF

   A. Thus change in benefits (as per NPV) [@ Rs (12,28,590 – 9,57,780) lakhs/ha x 33 Ha= 89.367 Lakhs
   B. Economic value of carbon storage:
   Change in economic value per Ha@ Rs (270040 – 95721)= Rs. 174319 = Rs. 1.74319 [Lakhs] for 60yrs.
   Thus economic value for 33 Ha for 50 yrs = Rs. 47.93 Lakhs
   Total Economic benefits due to compensatory afforestation = (A+B)= **Rs 137.297 Lakhs**

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Table 4: Estimation of cost of forest diversion (as per table B of guidelines)		
Sl No	**Parameter**	**Result(in Lakhs)**
1	Ecosystem services losses due to proposed forest diversion	202.59
2	Loss of animal husbandry productivity, including loss of fodder	20.259
3	Cost of human resettlement	0
4	Loss of public facilities and administrative infrastructure (Roads, buildings, schools, dispensaries, electric line, railways, etc.) on forest land, which would require forest land if these facilities were diverted due to the project	0
5	Possession value of forest land diverted	19634.49
6	Cost of suffering of oustees	0
7	Habitat Fragmentation cost	101.29
8	Compensatory afforestation and soil & moisture conservation cost	225.14
	Total Loss in lakhs	**20183.77**

Table 5: Existing guidelines for estimating benefits of forest – diversion in CBA (As per Table C of Guidelines)		
Sl No	**Parameters**	**Result(in Lakhs)**
1	Increase in productivity attribute to the specific project	56271.09
2	Benefits to economy due to specific project	78101.3098
3	No of population benefitted due to specific project	5430
4	Economic benefits due to of direct and indirect employment due to project	412388.88
5	Economic benefits due to compensatory afforestation	137.297
6	Total Benefit (2+4+5) in Lakhs	**4,90,627.487**

Cost to benefit ratio = 20183.77/4,90,627.487 = 1:0.041138=24.308

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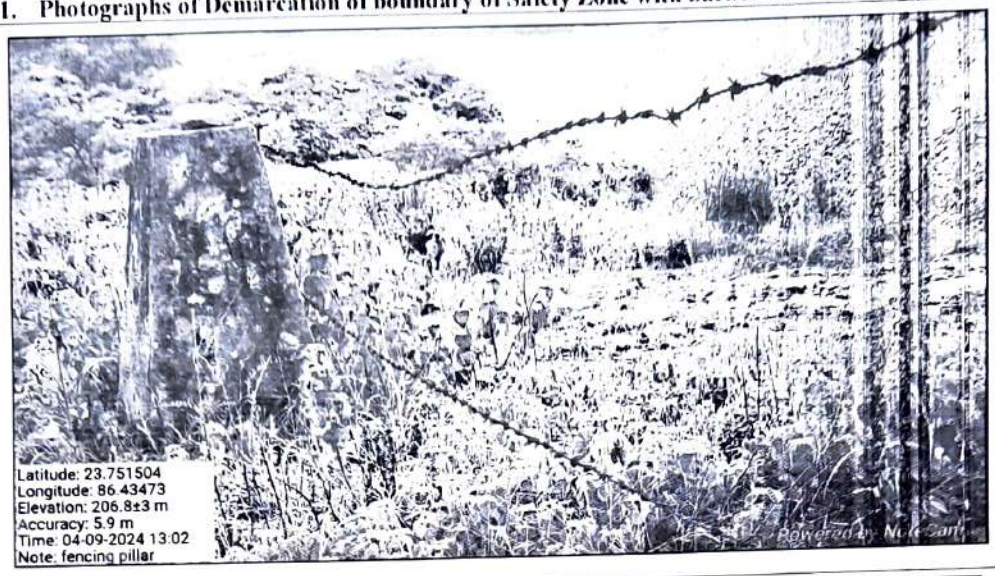
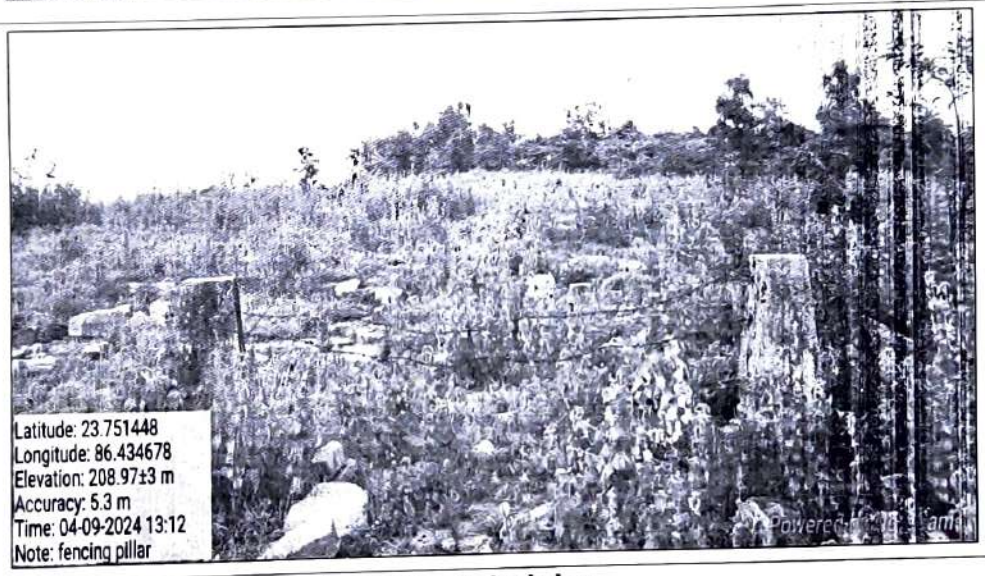
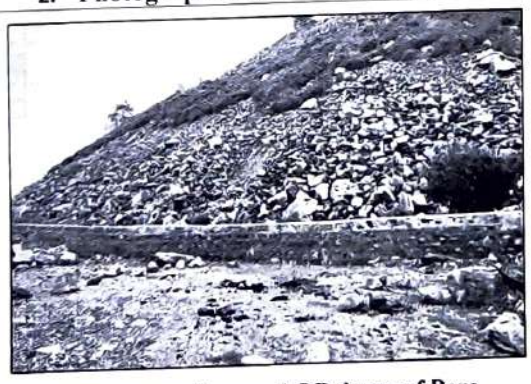
1. **Photographs of Demarcation of boundary of Safety Zone with barbed wire and RCC Pillars**





2. **Photograph of retention/toe walls and check dams**



Retention/ Toe wall around OB dump of Bera Colliery

Check dam over Chatkari Jore near Govardhan Eco-park

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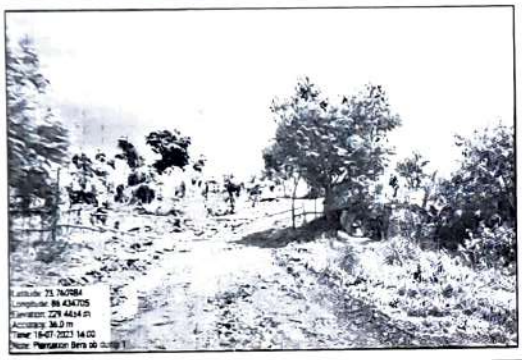
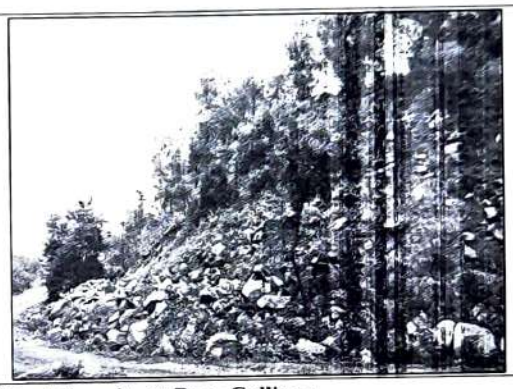
3. **Photographs of Top soil management**

4. **Photographs of Afforestation**



Plantation site at Dobari Colliery



Plantation site at Bera Colliery

Plantation site at Kuya Colliery

Plantation site at Kuya Colliery

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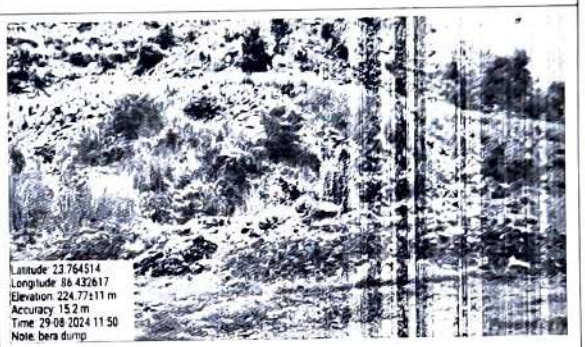
5. Photographs of Grassing

Seed ball broadcasting at OB dump of Bera Colliery

Seed ball broadcasted at OB dump of Bera Colliery

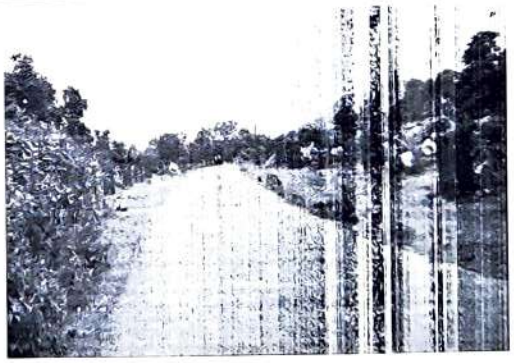
Grassing at OB dump of Kuya Colliery



Grassing at OB dump of Bera Colliery

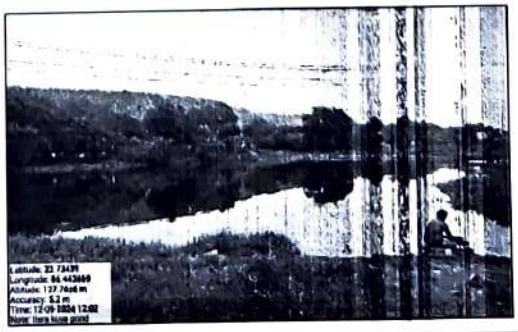
6. Photographs of Avenue Plantation

Avenue plantation along transportation route to BNR Railway siding



Avenue Plantation outside leasehold area

7. Photographs of Sedimentation Pond



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A. Sedimentation Pond at Bastacolla Colliery	B. Sedimentation Pond at Kuya Colliery
	
C. Sedimentation Pond at Victory incline, Bastacolla Colliery	D. Sedimentation Pond at Bera colliery

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REPORT FOR

Compliance of Forestry Clearance Conditions in respect of Chanoudih and Bera Projects of Bastacolla Area

Submitted to

Bharat Coking Coal Limited

Centre of Mining Environment
Department of Environmental Science and Engineering
Indian School of Mines
Dhanabd - 826 004

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REPORT FOR

Compliance of Forestry Clearance Conditions in respect of Ghanoodih and Bera Projects of Bastacolla Area

Submitted to

Bharat Coking Coal Limited

Centre of Mining Environment

Department of Environmental Science and Engineering

Indian School of Mines

Dhanabd - 826 004

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CONTENT

S.NO.	CONTENT
6	**SOIL EROSION STUDY**
a	Contouring of the area, slope study and micro- drainage pattern using satellite imagerics (2 km buffer)
b	Determination of run-off and identification of erosion prone area, hot spots like dumps, roads, fire area, excavated areas and others
c	Grain size distribution,infilteration rate, bulk density, porocity, etc. Of the soil and OB samples, soil quality assessment (structure and texture) and prepration of soil depth isopleths (2 km bufer)
d	Nutrient analysis of soil and OB samples
e	Estimation of sediment load for OB dumps, excvated area and opther areas
f	Dsign of diversion channel and sedimentation pond
g	Durvey of native plant species
h	Collection of seeds of native plants: Seeding per hectare, preservation, see viability test, breaking of seed dormancy to arrest soil erosion
i	Seeding of rass and legume mixtures as a initial colonisers for erosion control
j	Design of construction of check dams, retention wall etc. Based on Contour Map to prevent sliding down of OB materials
7	**PREPRATION OF PHASED RECLAMATION PLANS**
a	Survey of the reclamation sites
b	Computation of OB dump
c	Formulation of reclamation strategies
d	Design of Mine fill
10	**COMPREHENSIVE SOIL CONSERVATION PALN AND MEASURES**
a	Physical control measures
b	Biological control measurs
c	Other: Application of Geojute/ Geptextile

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EXECUTIVE SUMMARY

Syudy was conducted for compliance of forestry clearance conditions in respect of Ghanoodih and Bera projects of Bastacolla area, BCCL . The details study was conducted as per scope of work provided and mainly related to soil erosion , its conservation and reclamation plan.

Study area consist of Ghanoodih , Dobari and Bera projects of Bastacolla area in BCCL. Diversion of 234.08 ha forest land for coal mining is under two mouza Ghanoodih and Bera. 170.02 ha falls under Ghanoodih mouza and 64.06 ha falls under Bera mouza.

Overburden and soil samples were collected from 10 locations in the study area and characterise with respect to grain size distribution, bulk density, porocity, texture, nutrient anaylysis. Based on surface, drainage and contour plan design and location of check dam, retention wall, diversion channel and sedimentation pond is provided in the report. Location of dumps and distrubed land is also presented.

Based on approved mine plan reclamation startegies are also highlighted based on survey of the site. Location of coal and overburden dumps also presented in the report.

Survey of native plant species was also conducted and findings are presented in the report. Collection of seeds of native species, preservation, breaking of seed dormancy, seeding of grass and legume mixture are also reported.Physical and biological control measures for soil conservation also presented in detail.

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(Gurdeep Singh)

6.0 SOIL EROSION STUDY

a) Contouring of the area, slope study and micro-drainage pattern using satellite imageries

Study area mainly consist of Ghanoodih . Dobari and Bera Colliery. Diversion of 234.08 ha forest land for coal mining is under two mouza Ghanoodih and Bera. 170.02 ha falls under Ghanoodih mouza and 64.06 ha falls under Bera mouza. 13.44 ha of bera colliery and 50.62 ha of Dobari collier falls under bera mouza. Dobari colliery is a underround mine with life expectancy of 37 years. Bera colliery is designed for both OCP and undergrund workings. 2.25 ha forest land is required for OCP and 11.19 ha forest land is required for underground.

Bera. Dobari and Ghanoodih colleries are located on the eastern flank of Jharia coal filed with following coordinates.

	Ghanoodih	Bera	Dobari
Lattitude	23°43'38" N to 23°44'44" N	23°45'23" N to 23°46°55' N	23°15'00" N to 23°15'42' N
Longitude	86°26'09" E to 86°26'29" E	86°25'12" E to 86°26'37" E	86°25'37" E to 86°26'29" E

Surface plan and detail contour plan of the study area along with boundary of forest land is presented in figure 1. As per suface plan chatkari jore is the main driange source in the study area. Major drainge pattern , surface water bodies and vegetation cover are presented in figure 2 General slope of the area is towards chatkari jore. General altitude of land near jore is 190 m.s.l while towards non coal bearing side it increases in the range of beyond 200 m.s.l. Original Surface contour plan as per survey of India Toposheet is shown in figure 3. Forest land and dump locations are presented in figure 4.

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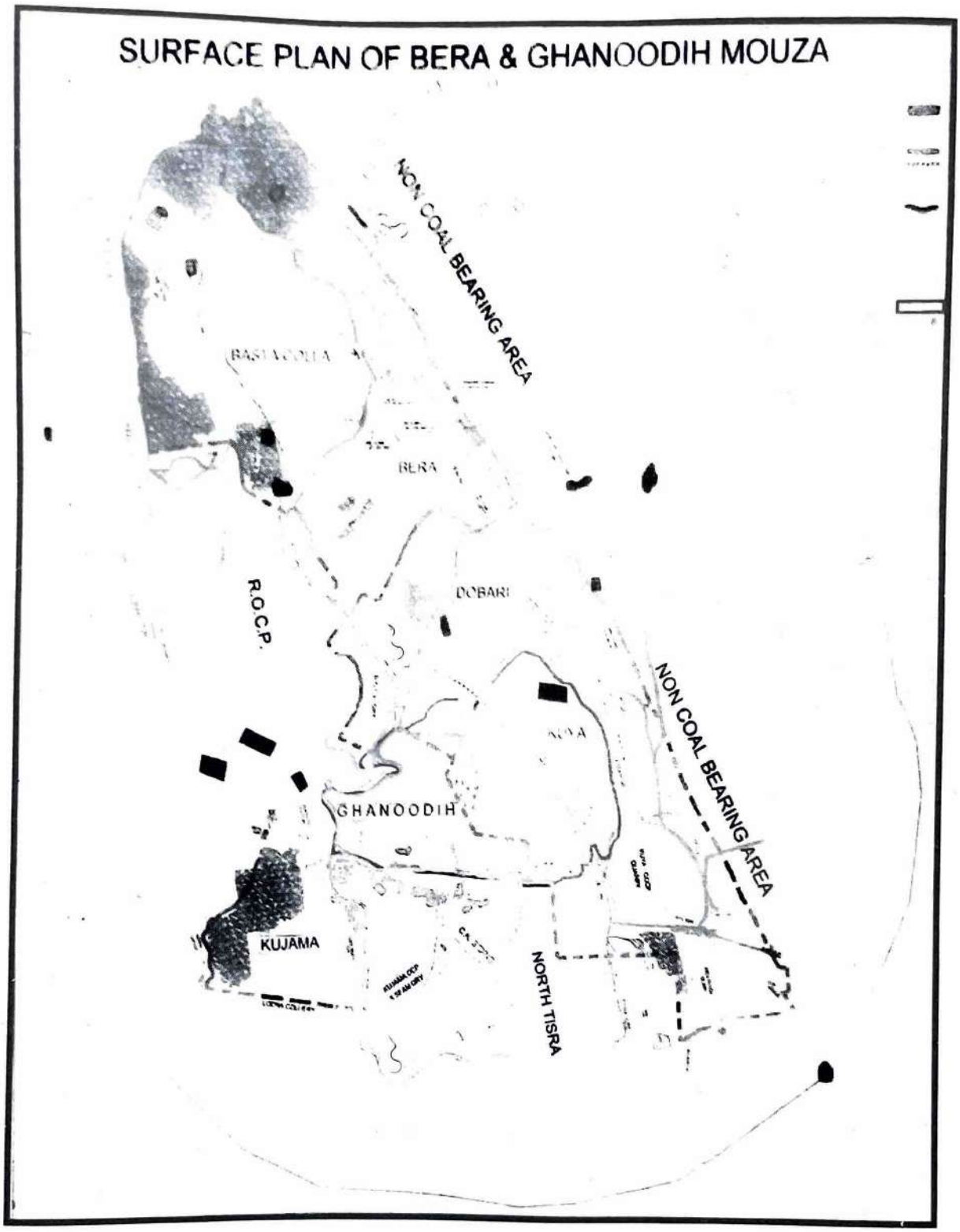

Figure 1: Surface Plan of the Study Area

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SURFACE WATER BODIES OF BERA & GHANOODIH MOUZA

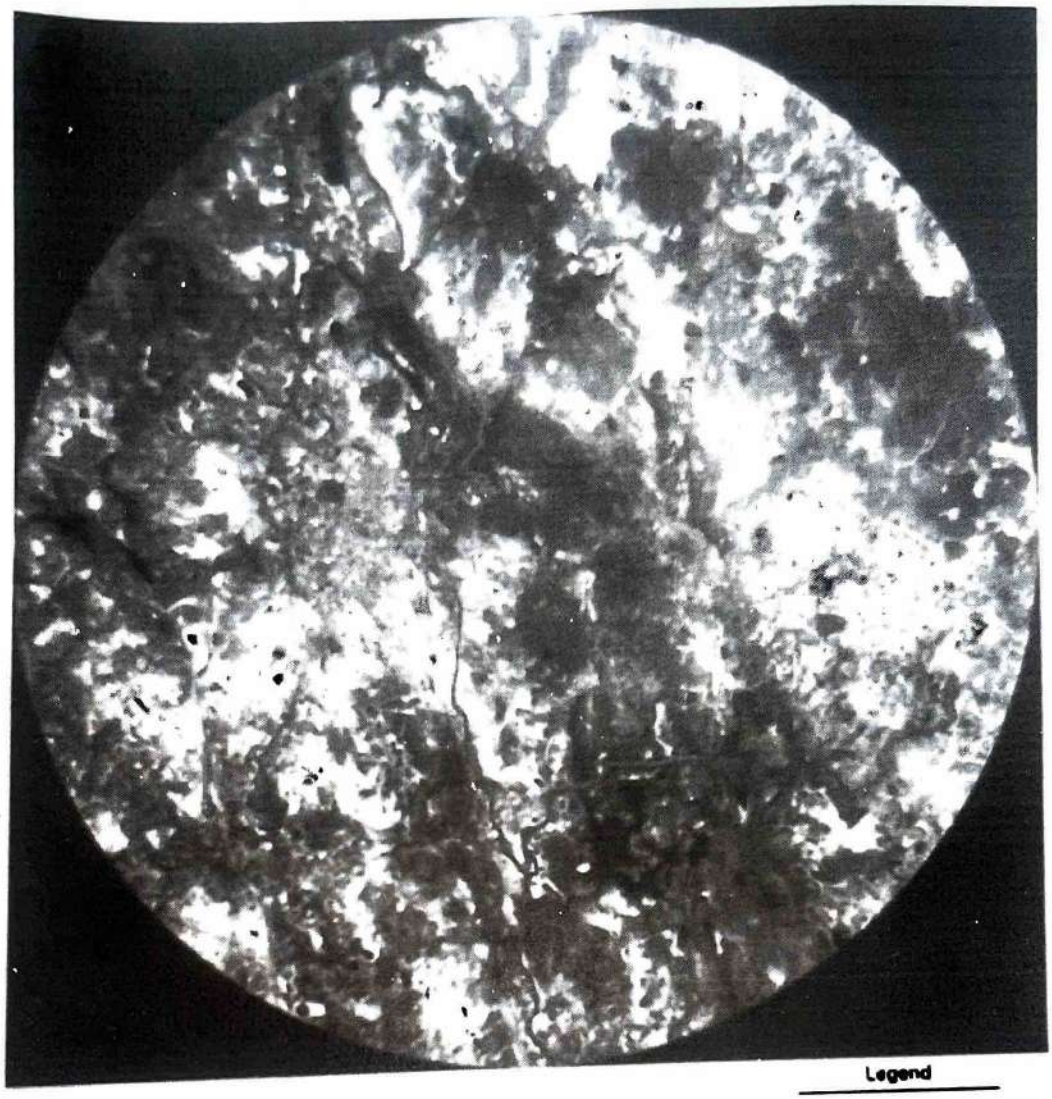

Figure 2 Drainage, surface water bodies and vegetation in the study area

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SURFACE WATER BODIES OF BERA & GHANOODIH MOUZA

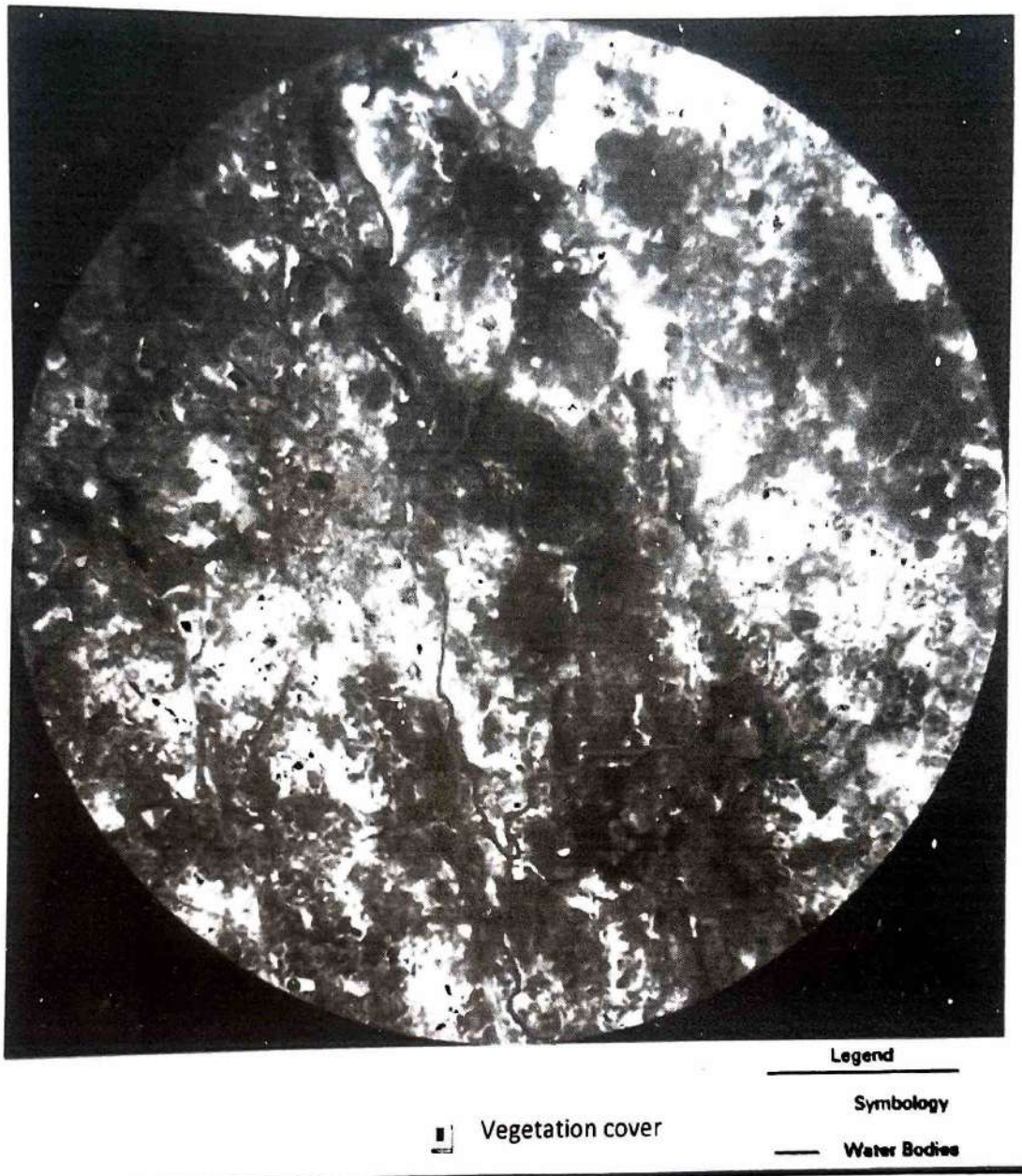

Figure 2 Drainage, surface water bodies and vegetation in the study area

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CONTOUR MAP OF BERA & GANOODIH MOUZA

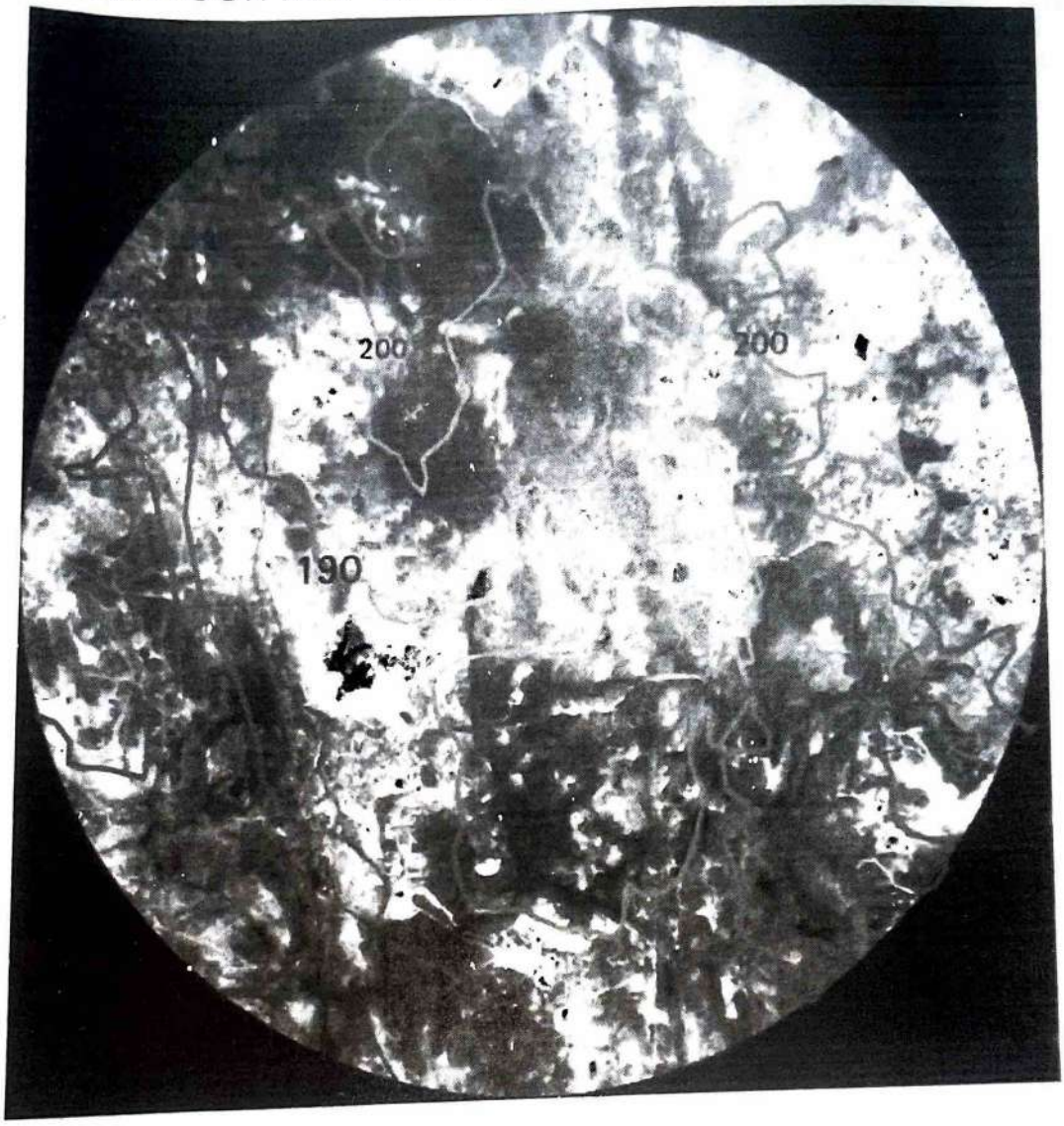

Figure 3 Original Surface Contour Plan of Study Area

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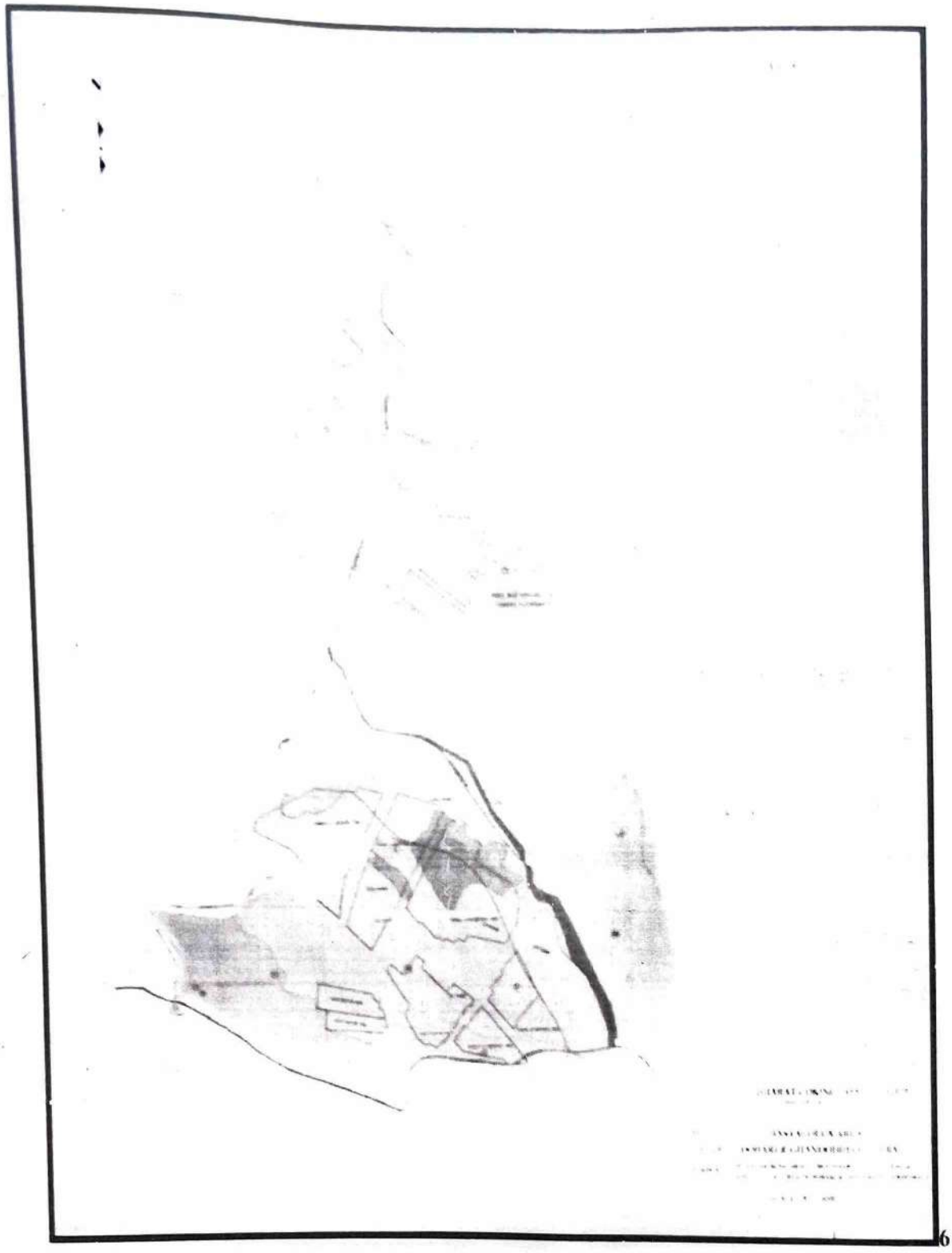

Figure 4 : Map of forest land along with location of dumps

(b)Dterrmination of Run-off

The entire rain water falling over the study area does not reach the surface streams and river channels. i.e.. Chatkari Jhore flowing across the study area from North to South. Certain part of

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this water is lost through evaporation/transpiration and infiltration. The remaining water, called Surface Runoff, joins the Chatkari Jhore. The yearly run-off in cm depth over the catchment area is termed as the yield of the drainiage basin. The surface run-off can be estimated by using the emperical formulas based on the total precipitation in the catchment area. The total yearly rainfall (cm) in the study area for past 10 years is shown in Table 1.

Table 1: Total Yearly Rainfall in Dhanbad

S. No.	Year	Total Rainfall (mm)
1.	2000	1390.0
2	2001	2094.0
3	2002	2311.0
4	2003	1731.5
5	2004	1370.5
6	2005	1678.5
7	2006	1516.0
8	2007	1823.0
9	2008	921.0
10	2009	1150.0
11	2010	

Based on the past 10 years rainfall data, the average yearly rainfall in the study area may be taken as 157.6 cm where as the maximum yearly rainfall that has occured during past 10 years may be considered as 231.1 cm. The run-off can be determined by using the direct rainfall run-off formula, i.e.

$$Q_y = K. P_y$$

Where, Q_y is the yearly runoff in cm;

P_y is the yearly precipitation in cm;

K is the constant given by Barlow's Table (Refer Table 2)

Assuming the catchment area to be of E type (For Hilly and Steep areas with hardly any cultivation) the avearage and maximum surface runoff corresponding to avearage and maximum yearly rainfall found to be 70.92 cm and 104 cm, respectively for the given catchment by Run-off Coefficient formula.

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Table 2: Barlow table of runoff Coefficient (K) for various types of catchment

S. No.	Class of Catchment	Description of catchment	Run-off percent (K)
1	A	Flat, Cultivated and Black Cotton Soils	10%
2	B	Flat, Partly Cultivated, various Soils	15%
3	C	Average	20%
4	D	Hills and Plains with little cultivation	35%
5	E	For Hilly and Steep areas with hardly any cultivation	45%

Lacey's formula was also used to determine the values of surface run-off in the study area: Accordingly,

$$Q_y = [P_y/(1+(304.8\ m/P_y\ n)]$$

Where, Q_y = yearly runoff in cm;

P_y = yearly precipitation in cm;

m = monsoon duration factor which was taken as 1.2 corresponding to the standard length duration of monsoon;

n = constant called catchment factor which was taken as 3.45 for E type of catchment (For Hilly and Steep areas with hardly any cultivation).

Accordingly, the avearge and maximum yearly surface run-off from lacey's formula were found to be 94.2 cm and 158.4 cm, respectively. A comparison of values of surface runoff calculated from the above two emperical formulas dictated that Lacey's Formula gives slightly higher estimate of the runoff compared to the runoff coefficient formula. Hence, the stimate of surface runoff obtained from Lacey's formula have been taken for further study and design purposes. Taking the catchment area of the study area as 12.57 sq. Km., the average and maximum yearly yield of the catchment found to be 12.5 Mm^3 and 19.9 Mm^3, respectively.

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Identification of erosion prone areas

Soil erosion from OB dump, haul roads and other excavated areas and sediment transport depend mainly on the climatic conditions, soil and spoil erositivity, overland slope and slope length, ground cover, soil conservation control practices, catchment drainage characteristics etc. Open-cast mining activities tend to change radically several of these factors and severe sediment production could occur in topsoil stockpiles, spoil piles, waste dumps, bare topsoil areas, steep out, haul roads etc. Scalping, blasting, material handling, heavy vehicular travel over replaced spoils, and topsoiling activities generally produce compacted areas of soil and spoil materials with a high colloidal content. The runoff potential from these areas is increased due to a reduction in infiltration and, if fine silts and colloidal particles are transported into major water courses, the impact of the increased sediment production might occur hundreds of kilometres downstream of the mine location. Colloidal particles require a very long detention time in an impoundment before they will settle out of suspension and frequently deposition does not occur until the sediment laden flows discharge into large water supply dams. Based on the site survey and drainage characteristics, following major erosion prone sites were identified as shown in Location map of the study area:

- OB dumps
- Haul roads
- Fire areas
- Open cast excavated areas

(c) Soil Quality Assessment (Structure & Texture)

Study area:

The sampling sites for collection of soil samples were located between N23^0 44.322'latitude and E86^0 26.389' longitude in Bastacolla mining area of Jharia coal field, Jharkhand (Fig 5). Ten samples were collected covering the entire study area with due consideration to coal bearing and non-coal bearing areas. The locations and descriptions of the sampling sites are given Table 1. Equipments like spade and pick axe were used to dig the stony part of the mine spoils while corers and augers were used to dig the less stony parts of the dump. The method of sampling involved digging surface upto 20 cm and collecting the soils/mine spoils in air-tight plastic packets. There were marked differences in the texture, colour, fineness and type of the soil samples.

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Sampling site	Latitude and Longitude	Description of Site
S 1	N23^0 44' 41.1" E86^0 25' 45.4"	Backfill area near view point Ghanudih
S 2	N23^0 43'48.2" E86^0 25' 57.2"	Kujama office
S 3	N23^0 44' 19.3" E86^0 26'8.3"	Fire affected OB dump, Ghanoodih
S 4	N23^0 44'52.1" E86^0 26'23.2"	Near 4-5 Pit (3 years old plantation site)
S 5	N23^0 45' 33.7" E86^0 26'16.1"	Near 16-17 Incline (Grassland)
S 6	N23^0 45'60.3" E86^0 25'39.4"	Near Sahana Village (Forest)
S 7	N23^0 46'11.6" E86^0 25'45.3"	Fresh overburden dumps; loose grayish and sandy material.
S 8	N23^0 46'30.7" E86^0 25'51.7"	Fresh overburden dumps with sparse plantation; loose grayish and sandy material.
S 9	N23^0 45'58.4" E86^0 26'24.8"	New Magzine Area
S 10	N23^0 45'19.4" E86^0 24'46.4"	Near Bastacola Office

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OIL SAMPLES LOCATION OF BERA & GANOODIH MOUZA

Figure 5 Location of soil samples in study area

Laboratory analysis:

Soil samples were analyzed for physical properties like soil bulk density, soil porosity, soil structure and texture. Soil bulk density is simply the dry weight of soil per unit volume of the soil. Soil porosity is the percentage of soil volume void of solids, or the volume that can be occupied by gas and liquid. Soil particle density is the weight of soil solids per volume they occupy. The soil samples were dried in an oven at 105°C for 24 hours. The samples were cooled to room temperature in a dessicator. Bulk density, Particle Density and Soil Porosity was determined by Gravimetric Method as follows:

Bulk density (D_b) = weight of oven dry soil / bulk volume of soil

Particle density (D_p) = weight of oven dry soil / volume of particles

Soil porosity (%) = $100 - [D_b / D_p * 100]$

Further. Particle size analysis was performed by following Sieve Shaker method (IS: 2720: Part 4: 1985)

Soil textures are classified by the fractions of each soil (sand, silt, and clay) present in soil samples. Classifications are typically named for the primary constituent particle size or a combination of the most abundant particles sizes, e.g. "sandy clay" or "silty clay." A fourth term, loam. is used to describe a roughly equal concentration of sand, silt, and clay, and lends to the naming of even more classifications, e.g. "clay loam" or "silt loam." Based on the fractions of Silt. Clay and Sand present in soil and OB samples, the soils were classified accordingly as per USDA system (USDA, 1999) from the soil texture triangle (Fig. 6)

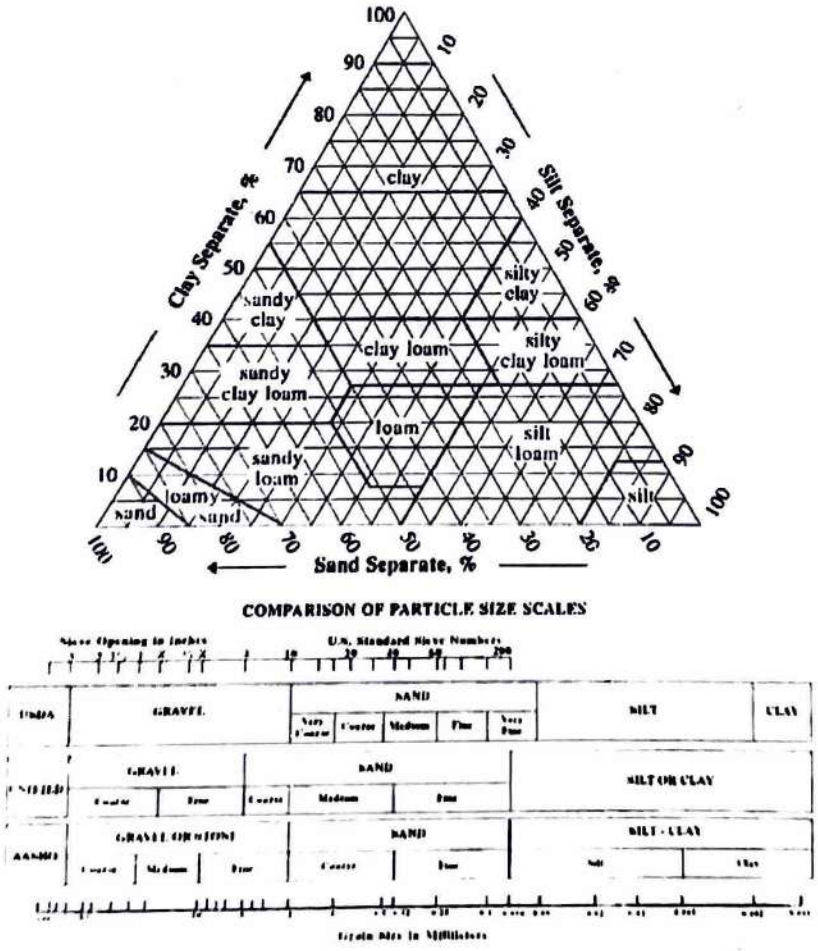

Figure 6: Soil Texture Triangle

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Results

The physical properties of the soil and OB samples viz.. bulk density. porosity and factions of clay. silt and sand are presented in table 2. The bulk density of soil and OB dumps collected from the study area varied from 1.02 – 1.58 g/cc with lowest values recorded from station S8 (fresh overburden dumps) and highest values recorded for soil samples from S5 (grasslands). Porosity also showed the similar trend and varied from 39.97% at S5 (grasslands) to 61.51% at S8 (Fresh OB dumps). The results of Soil texture and classifications are shown in table 3. The soil and OB samples collected from S1 (Backfill area near view point Ghanudih), S2 (Kujama office) and S10 (Near Bastacola Office) are classified as Loamy Sand. The samples collected from S3 (Fire affected OB dump). S4 (Near 4-5 Pit), S5 (Near 16-17 Incline) and S6 (Near Sahana Village) represents sandy soil. S7 and S8 (Fresh overburden dumps) may be classified as Sandy Loam.

Table 3: Classification of soil and OB samples

Sample	Bulk Density (g/cc)	Porosity (%)	Infiltration rate (mm/hr)	Sand (%)	Silt (%)	Clay (%)	Soil Classification
S1	1.38	50	23	77.95	15.75	6.30	Loamy Sand
S2	1.29	49.21	21	84.55	10.30	5.15	Loamy Sand
S3	1.18	49.88	40	87.64	8.24	4.12	Sand
S4	1.31	58.89	45	87.40	10.50	2.10	Sand
S5	1.58	39.97	34	89.70	9.27	1.03	Sand
S6	1.41	46.61	38	90.82	6.12	3.06	Sand
S7	1.38	47.93	28	70.88	18.72	10.40	Sandy Loam
S8	1.02	61.51	15	61.89	25.75	12.36	Sandy Clay Loam
S9	1.27	52.08	25	71.34	18.36	10.30	Sandy Loam
S10	1.15	56.61	22	81.66	12.24	5.10	Loamy Sand

The particle size distribution curves were plotted for all the soil samples as per Indian Standards (IS: 2720: Part 4: 1985). Fraction of soil retained on each sieve size was determined and

subsequently the %finer fraction for each particle size was determined. The curves between particle size and % finer fraction were plotted, on semi log graph paper, to estimate the particle size distribution of the soil samples. The plots are shown in Figure 7 – Figure 16. The effective size (D_{10}) and uniformity coefficients (D_{60}/D_{10}) thus calculated from the particle size distribution curves are shown in Table 4. The effective size of the soil samples varied from 0.17 mm to 0.26 mm. The uniformity coefficient varied from 2.08 for sample S2 to 3.60 for sample S7.

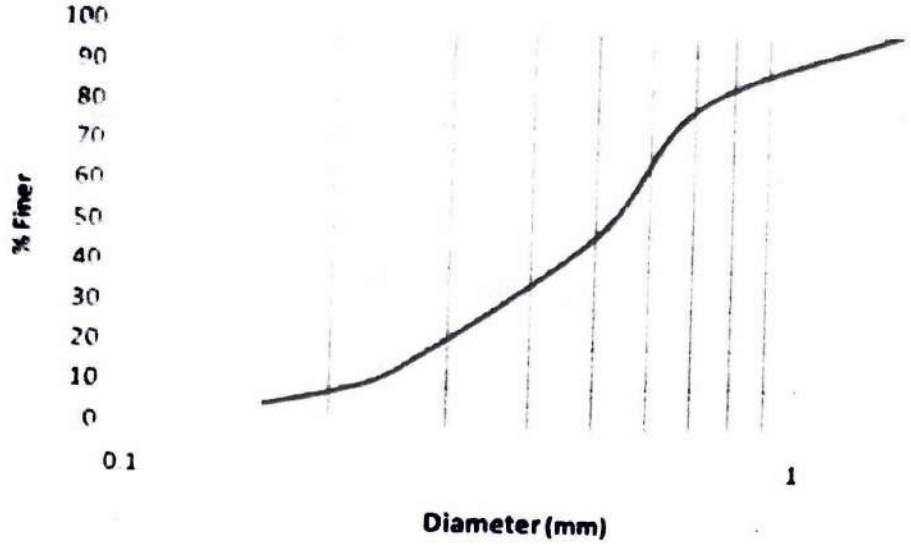

Figure 7: Particle size distribution curve for soil sample S1

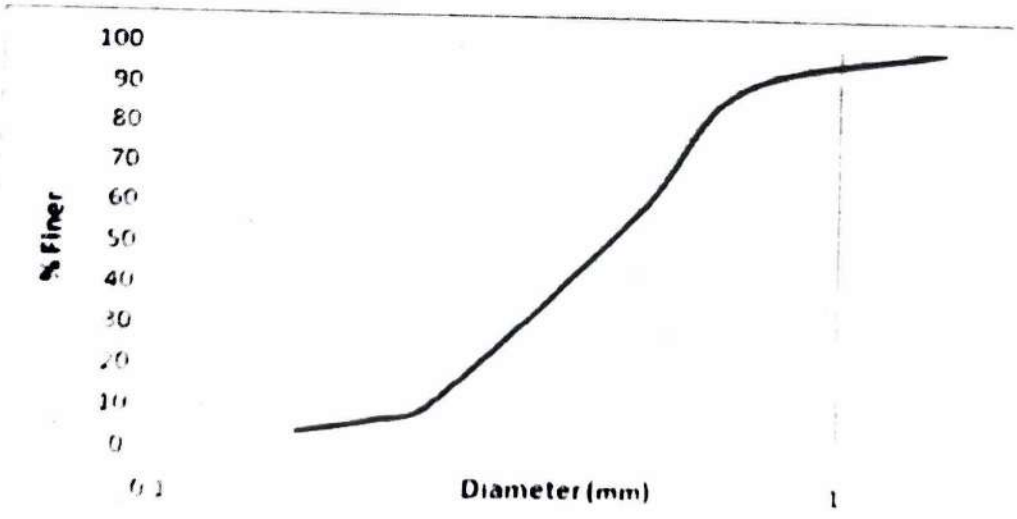

Figure 8: Particle size distribution curve for soil sample S2

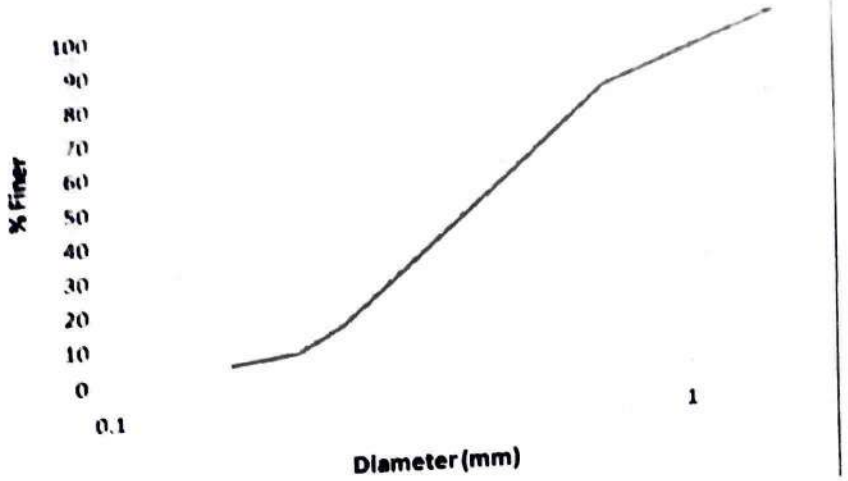

Figure 9: Particle size distribution curve for soil sample S3

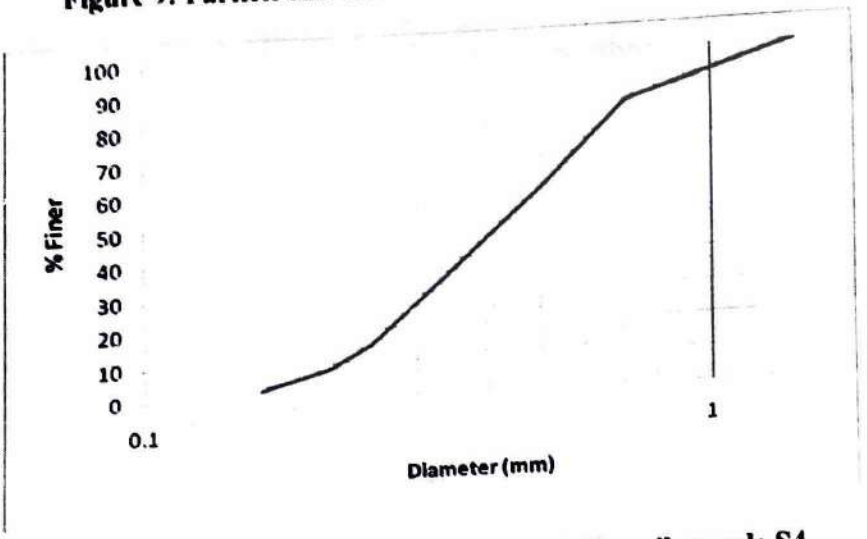

Figure 10: Particle size distribution curve for soil sample S4

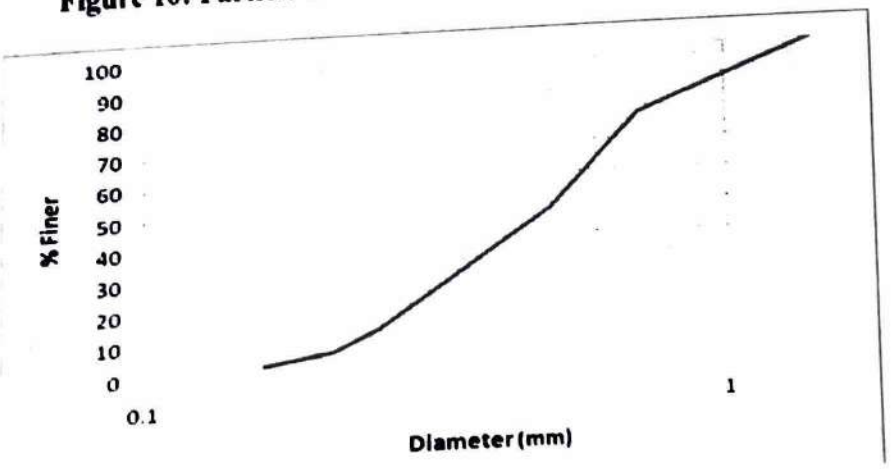

Figure 11: Particle size distribution curve for soil sample S5

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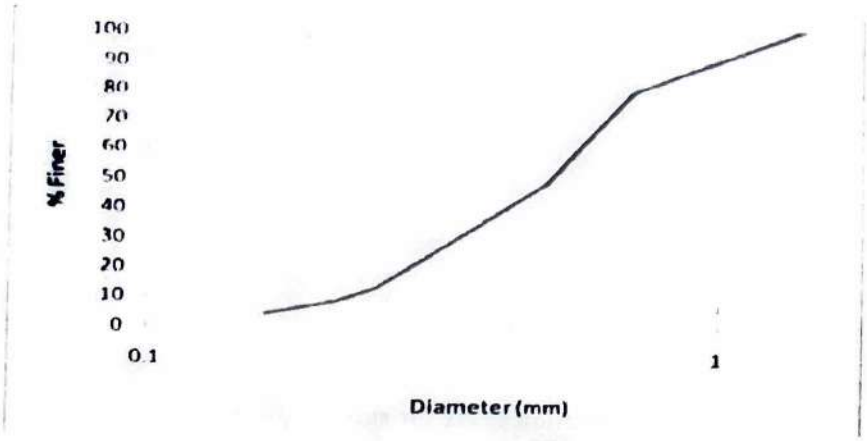

Figure 12: Particle size distribution curve for soil sample S6

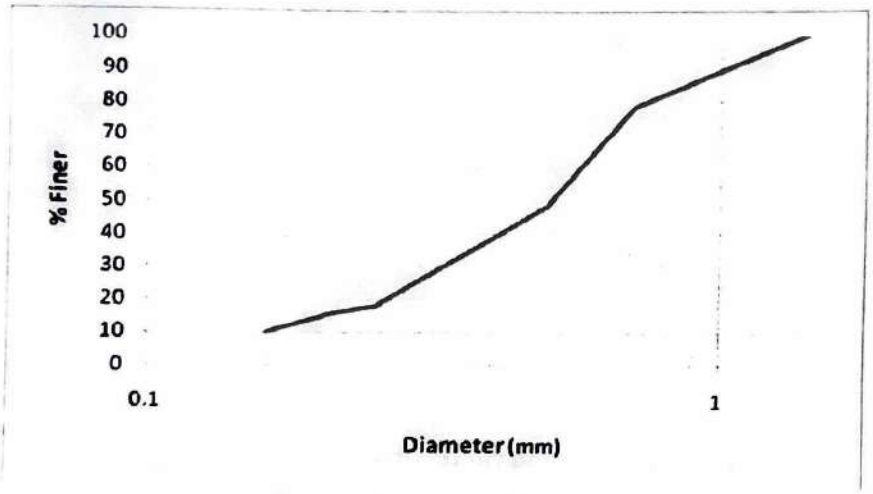

Figure 13: Particle size distribution curve for soil sample S7

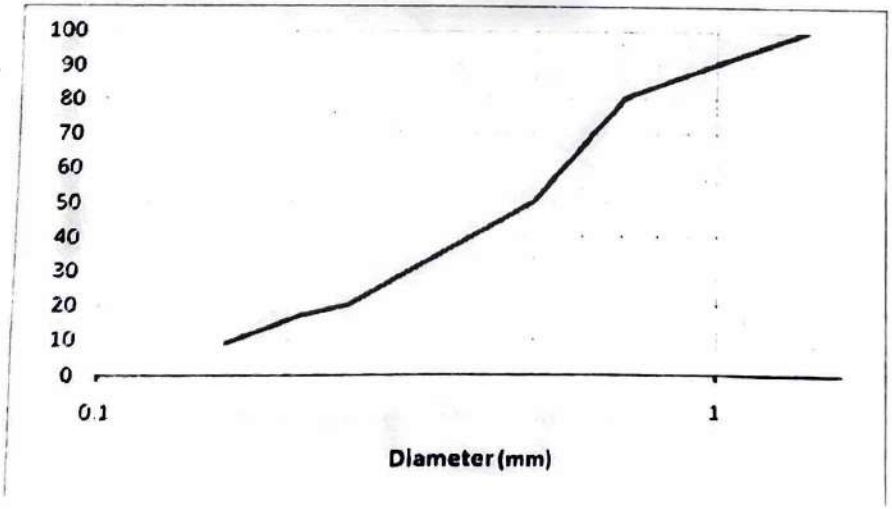

Figure 14: Particle size distribution curve for soil sample S8

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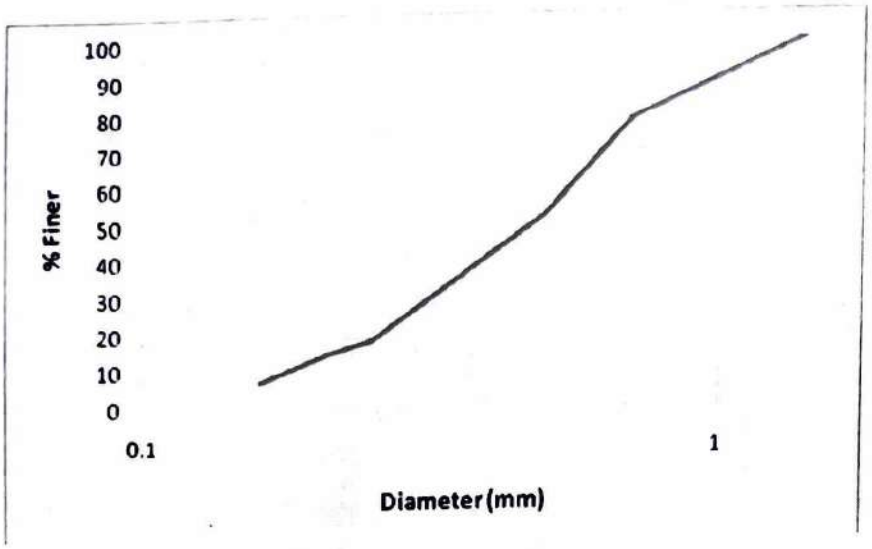

Figure 15: Particle size distribution curve for soil sample S9

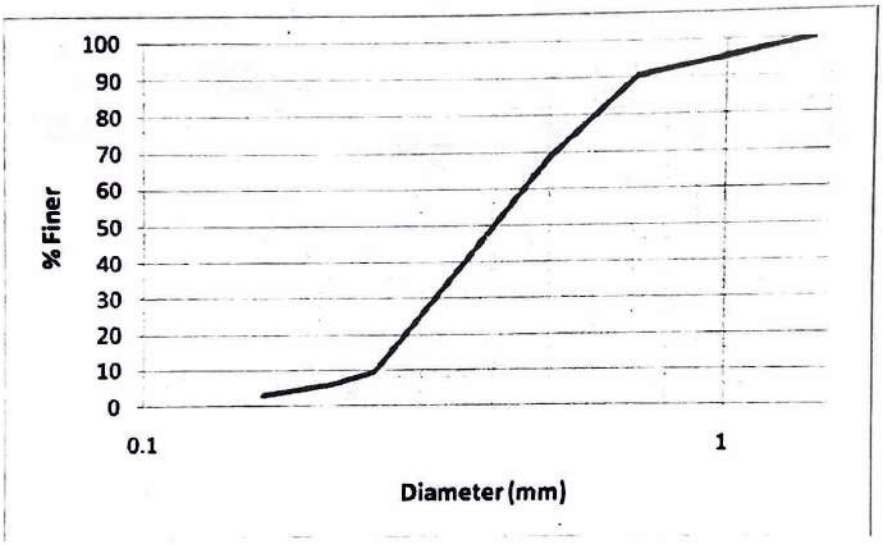

Figure 16: Particle size distribution curve for soil sample S10

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Table 4: Effective Size and Uniformity Coefficient for soil samples

Soil Samples	Effective Size (D_{10})	Coefficient of Uniformity (D_{60}/D_{10})
S1	0.22	2.5
S2	0.25	2.08
S3	0.21	2.2
S4	0.22	2.27
S5	0.24	2.41
S6	0.21	2.55
S7	0.17	3.6
S8	0.18	3.32
S9	0.18	3.11
S10	0.26	2.1

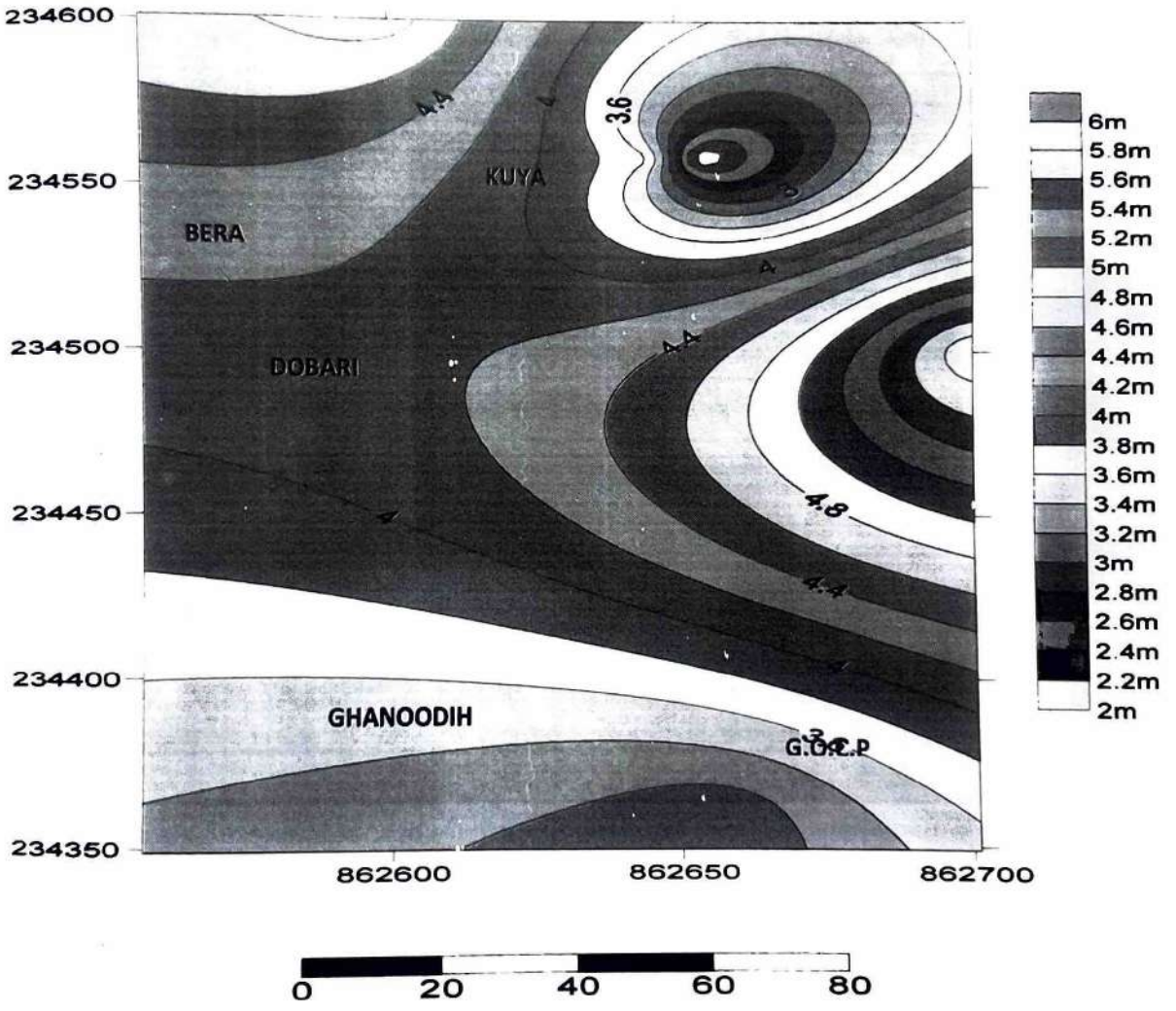

Figure 17: Soil depth isopleths of the study area

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The soil depth in the study area varied from 2- 6 m with in 2 Km of buffer area. The variation of the soil depth along with the latitude and longitude of the study area is shown in the soil depth isopleths map in figure 17.

(d) Nutrient Analysis of soil and OB Samples

Study area:

The sampling sites were located between N23^0 44.322'latitude and E86^0 26.389' longitude in Bastacolla mining area of Jharia coal field, Jharkhand (Fig 15). The younger geological formation belongs to the Gondwana System, the lower division of which comprises the most important coal measures of India. The coal fields lying in the Damodar valley are the westerly continuation of the great belt of coal fields beginning with the Raniganj coal fields in West Bengal and followed by the Jharia coal fields. The fresh mine spoils contain approximately 80 % sand. 11 % silt, 9 % clay and a low concentration of nutrients. The rocks are fine to coarse grained sand stones, with ferruginous bands, carbonaceous shell and coal seams.

Field survey and sampling:

Samples of soils and mine spoils were collected from different mining and vegetation sites (Fig 17). The descriptions of the sampling sites are given Table 1. Equipments like spade and pick axe were used to dig the stony part of the mine spoils while corers and augers were used to dig the less stony parts of the dump. The method of sampling involved digging surface upto 20 cm and collecting the soils/mine spoils in air-tight plastic packets. There were marked differences in the texture, colour, fineness and type of the soil samples. The surface temperature was measured simultaneously using a thermometer.

Laboratory analysis:

The air dried samples were crushed in pastel and mortar to remove the soil particles sticking to the non-soil particles if any followed by sieving with a 2 mm sieve to separate the soil and non-soil parts. The soil particles were again sieved in a 500 µm sieve to get the finer soil. The finer soil particles were put into small air-tight packets, which were used for physico-chemical parameters and nutrient analysis.

The physico-chemical properties of the samples were determined as per the standard procedures (Jackson, 1973). The pH was analysed by pH meter (Mettler Toledo MA-235) and electrical conductivity (EC) by Sonar, Digital conductivity meter.

Figure 18. Sampling of soil and OB samples

Results:

The surface temperature at the time of sampling varied from 28 to 65 °C where the maximum temperature was recorded in S3 (Table 5). The slightly acidic pH, moderate to high electrical conductivity, high moisture and high cation exchange capacity were associated with those sampling sites which are having vegetation cover e.g. S4, S5 and S6 (Table 6). The gradient analysis of cation exchange capacity showed following descending trend: Forest> Plantation (10 years old) > Plantation (3 years old)> Fresh OB> Active Mine Fire Areas. These results revealed that the presence of vegetation improve the physico-chemical properties of soils while in mining areas lack of vegetation showed negative impact. This infers that, there is lack of preservation of top soils and sub-soils in the study area. Further, mismanagement in transport and dumping of OBV materials encroach the vegetation cover present in terrestrial and aquatic systems (Figure 19).

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Table 5. Summary of sampling site characteristics.

Sampling site	Surface Temperature (°C)	Latitude and Longitude	Site characteristics
S 1	33	N23^0 44.685' E86^0 25.756'	Backfill area near view point Ghanudih
S 2	65	N23^0 43.804' E86^0 25.953'	Kujama office, lack of vegetation.
S 3	28	N23^0 44.322' E86^0 26.138'	Fire affected OB dump, Ghanoodih
S 4	33	N23^0 44.869' E86^0 26.389'	3 years old plantation site; inhabited by *Acacia nilotica, Butea monosperma, Casia semia* etc; *Ocimum bacillicum was* found to be dominant; Neem seedlings and *Eucalyptus spp.* were also found; the litter consisted of burnt leaves.
S 5	28	N23^0 45.562' E86^0 26.269'	Grassland: *Dicanthium spp.* and *Paspalum spp.* 10 years old plantation site; inhabited by *Acacia nilotica, Dalbergia sissoo, Anthocephalus kadamb, Ficus lacor, Lantana spp.* and *Ficus spp.;* abundant litter and natural shelter for lower animals.
S 6	28	N23^0 45.330' E86^0 25.656'	Forest; inhabited by *Albizzia procerra, Dalbergia sissoo, Delonix regia* and *Phoenix spp*; soil surface was yellowish in color.
S 7	33	N23^0 46.193' E86^0 25.755'	Fresh overburden dumps; loose grayish and sandy material.
S 8	35	N23^0 46.512' E86^0 25.862'	Fresh overburden dumps with sparse plantation; loose grayish and sandy material.

Table 6. Summary of physico-chemical parameters of soil and OB samples.

S. No	Parameters	Unit	S 1	S 2	S 3	S 4	S 5	S 6	S 7	S 8
1	pH		6.9	6.3	5.5	6.9	6.0	6.8	5.9	6.0
2	Conductivity	mhos/cm	0.7	0.5	0.3	0.6	0.4	0.5	0.5	0.5
3	Moisture Content	%	3.8	3.08	2.5	1.04	1.2	2.6	2.9	2.3
4	Water Holding Capacity	%	28.16	37.94	35.60	37.74	24.08	38.1	22.12	21.8
5	Organic Carbon	%	2.08	5.08	6.38	1.37	0.84	1.60	0.80	0.80
6	Organic Matter	%	3.4	8.7	10.4	2.3	1.4	2.3	1.23	1.19
7	Ex .Sodium	ppm	18.00	8.5	7.8	9.5	8.6	7.53	6.00	6.00
8	Ex. Calcium	ppm	60.43	24.86	45.75	78.6	81.6	74.53	43.2	37.12

9	Ex. Potassium	ppm	11.9	24.5	18.6	42.4	26.8	43.3	18.1	18.2
10	Available Nitrogen	ppm	2.52	26.6	170.0	82.6	84.0	68.7	3.8	4.0
12	Available Phosphorus	ppm	0.20	0.34	0.16	0.23	0.20	0.19	0.13	0.15
14	CEC	Meq 100g	5.03	9.12	14.0	10.2	18.5	17.14	7.28	6.12

Encraochment of Weeds

Over burden dumping in mine fire areas

Figure 19

(e) Estimation of Sediment Load for OB dumps, excavated areas and other areas

An evaluation was made of the erositivity characteristics of topsoil materials at the mine through collection and analysis of soil samples from various location distributed along major erosion prone areas as discussed in section 6c. The erodibility factor, K, was then determined by using soil erodibility nomograph of Wischmeier et al. (1971) as shown in Fig. 20. To use the nomograph. enter the left-hand scale with the silt plus very fine sanâ content and proceed to points representing the % sand, % organic matter, structure, and permeability in that sequence as illustrated by the dotted line on the nomograph. Interpolate between plotted curves. The average value of erodibility factor (K) was thus determined to be 0.25 -0.3. Henceforth for estimation of sediment load, an maximum erodibility factor K of 0.3 was taken. Assuming the average slope of the OB dump to be 1:10 and average slope length of 25 m with ground cover of 0%, the sediment load from Table 7. was calculated to be 1.8 t/ha/year. Table 1 shows the sediment load for different slope length, and erodibility factor

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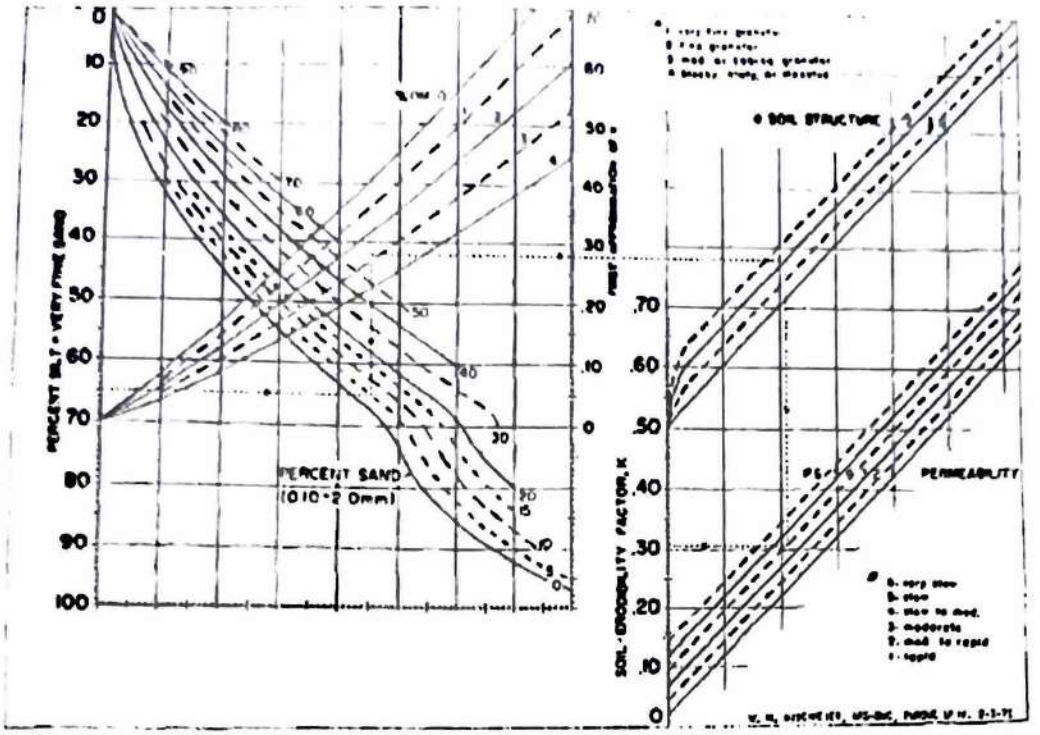

To use the nomograph, enter the left-hand scale with the silt plus very fine sand content and proceed to points representing the % sand, % organic matter, structure, and permeability in that sequence as illustrated by the dotted line on the nomograph. Interpolate between plotted curves.

Figure 20: Soil Erodibility Nomograph of Wischmeier et al. (1971).

Table 7: Potential gross erosion for various erodibility factor and slope lengths

Erodibility factor (K)	Slope length 100 m Slope: 1:30	1:10	1:3	Slope length 50 m Slope: 1:30	1:10	1:3	Slope length 25 m Slope: 1:30	1:10	1:3
BARE SOIL									
0.1	1.11	5.23	17.76	0.89	1.89	13.32	0.36	1.33	8.88
0.2	2.22	10.66	35.52	1.78	3.77	26.64	0.71	2.66	17.76
0.3	3.33	15.99	53.28	2.67	5.66	39.96	1.07	3.99	26.64
0.4	4.44	21.32	71.04	3.56	7.54	53.28	1.42	5.32	35.52
GROUND COVER 0%*									
0.1	0.50	2.40	8.00	0.40	0.85	6.00	0.16	0.60	4.00
0.2	1.00	4.80	16.00	0.80	1.70	12.00	0.32	1.20	8.00
0.3	1.50	7.20	24.00	1.20	2.55	18.00	0.48	1.80	12.00
0.4	2.00	9.60	32.00	1.60	3.40	24.00	0.64	2.40	16.00
GROUND COVER 20%*									
0.1	0.22	1.06	3.52	0.18	0.39	2.64	0.07	0.27	1.76
0.2	0.44	2.11	7.04	0.35	0.75	5.28	0.14	0.53	3.52
0.3	0.66	3.17	10.56	0.53	1.14	7.92	0.21	0.80	5.28
0.4	0.88	4.22	14.04	0.70	1.50	10.56	0.28	1.06	7.04

*Per cent of canopy in contact with the ground.

Design of Diversion Channel and Sedimentation Pond:

To size hydraulic controls such as diversion channel and sediment ponds it is necessary to determine the design discharge (peak surface runoff) and sediment load for the study area.

Design of Diversion Channel

Due to the presence of fire near X Seam Quarry, the Chatkari Jhore has to be diverted to avoid any accidents/mishappenings. The diversion channel will start from XI/XII Seam Quarry (23°44.234'N and 86°25.488'E) and will be passing around XI/XII Seam Quarry and rejoin the Chatkari Jhore near X Seam Quarry (23°43.747'N and 86°25.476'E) as shown in the suface location map Fig. 1.2 & 3). The diverted channel was designed as open channel using Manning's Equation for peak discharge. The peak discharge was calculated considering the 24 hr maximum rainfall (279 mm) observed during last 10 year assuming the runoff coeficient of 0.45. Table 8 shows the 24 hr maximum rainfall data recorded during last 10. Accordingly the the peak discharge was found to be 18.27 cumec. Therefore the design discharge was taken as 20 cumecs. The length of diversion channel required is 500 m with the available datum head of 5 m. The slope of the channel may be taken as 1:100. This diversion channel shall be diverted at an angle of 45-55° from direction of the flow in the Chhatakari Jhore. The average value of Manning roughness coefficient for cement concrete lined regular finish surface of the channel was taken to be 0.014 as per the guidelines of Surface Mining water Diversion Design Mannual Chapter 4 . Assuming the velocity of flow being 2.5 m/s, the cross section of the channels were determined. The designed cross section is shown in Figure 21. Accordingly a trapezoidal channel of bottom width 1.5 m . depth 2.2 m with side slope of 1:1 should be provided with the bed slope of 1:1000. Provision of 0.5 m free board (F.B.) has been made to account for overflow during flooding conditions.

Table 8: 24 hr Maximum rainfall data recorded during last 10 years in Dhanbad

S. No.	Year (Day)	Total Rainfall (mm)
1.	2000	
2	2001	
3	2002 (1/7/02)	152
4	2003 (9/07/02)	82.3
5	2004 (12/7/04)	103.5
6	**2005 (14/07/05)**	**279**
7	2006 (8/07/06)	190
8	2007 (5/7/07)	194

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9	2008 (21.09.08)	49
10	2009 (6.09.09)	118.5
11	2010 (15.9.10)	130

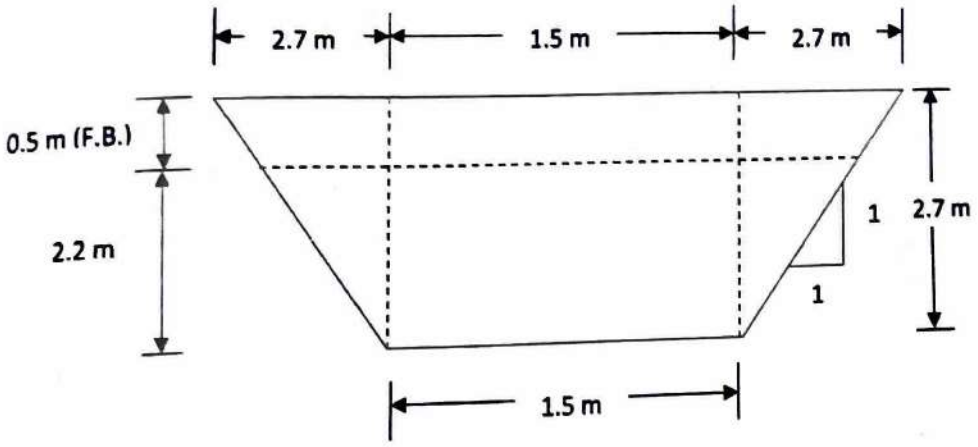

Figure 21: Cross Sectional Details of Diversion Channel

Design of Sedimentation Pond

In order to arrest the sediment load, 6 Nos of check dams have been proposed along the Chatkari at different erosion areas. In addition to these check dams, two Nos of sedimentation ponds one at the u/s of the proposed diversion channel and one at the outer periphery of the study area to control the sediment load in the D/s of the chatkari Jhor. The particle size distribution of waste dump and topsoil materials at mine site indicated loamy sand and it was established that sediment ponds with a detention time of 0.5 - 1 h would be sufficient to settle down the sediments. However, for the design of sedimentation ponds, detention time of 1 hr was assumed. Any sediment pond should have a minimum temporary storage volume which is 1.5 times the volume of flow entering the pond during a period equal to the detention time. These sedimentation tanks were designed on the basis of avearge surface runoff generated during the monsoon period (June-Sept) which is estimated to be 1.2 m^3/s. For this design discharge, the minimum storage capacity of the sedimentation pond was estimated to be 2100 cum. Accordingly the dimensions of the rectangular shape sedimentation pond was calculated which is shown in Figure21a. Accordingly, the a sedimentation tank of length 40 m width 30 m with depth of 5.4 m would be required for arresting the sediment load. The provison of F.B. of 0.6m have been made to account for overflow during high flooding conditions.

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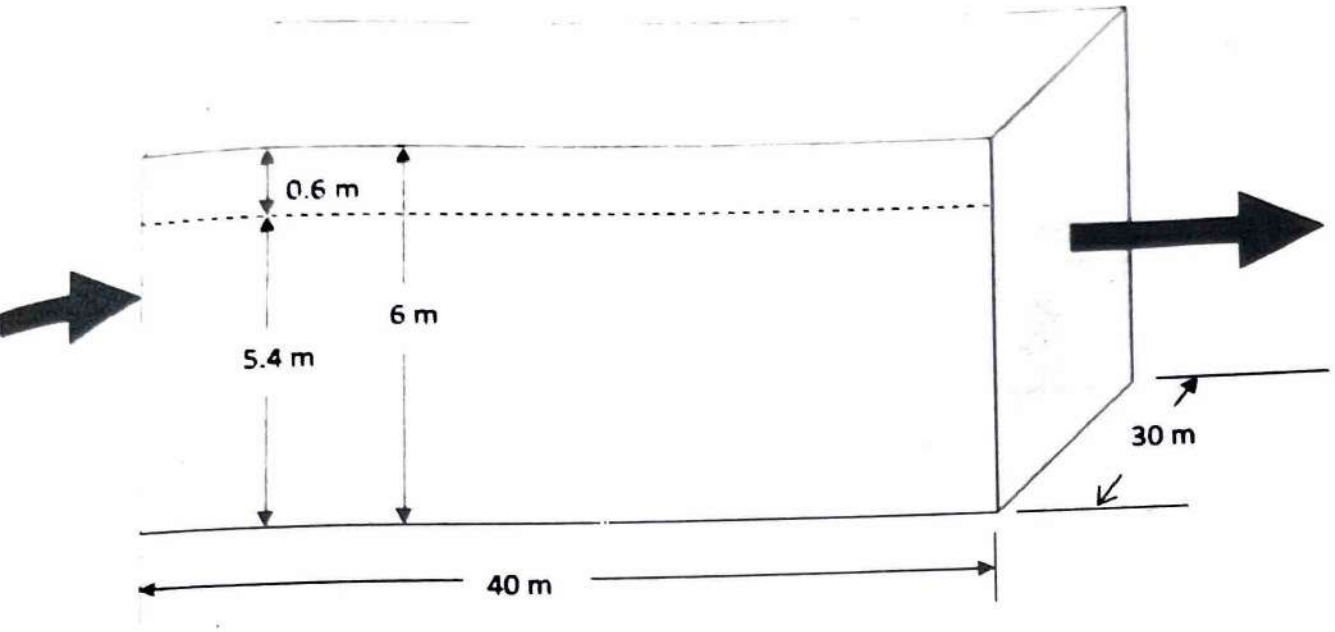

Figure21a: Cross Sectional Dimensions of Sedimentation Ponds

g) Survey of Native Plant Species

The Ghanoodih and Bera Projects of Bastacola Area in Dhanbad district was selected for survey of native plant species. It is situated in Barakar formation of Gondwana Supergroup. Climatically the area is of dry tropical type. The summer temperature ranges between 21-42 °C and winter between 10-17.5 °C. The temperature in summer may reach upto 45 °C and in winter below 5 °C upto 2 °C). The average annual rainfall is 1065 mm. The forest fragments are tropical dry deciduous type and covering 20.5% of total area of the Bastacola region.

The present survey was carried out in the Ghanoodih and Bera Projects of Bastacola Area from January, 2011 to March 2011. Plants of ethnobotanical importance were collected and enumerated according to their local name and family.

The detailed assessment of the productive capacity, plant resources and cultivation of valuable medicinal and economically important plants indicate that in Bastacola, plant diversity conservation method is required to retain the native plant species. There were twenty families

were 20 tree species (Table 9). These species are both timber and non-timber yielding trees. The largest family was Fabaceae with six tree species. Regeneration capacity of all these tree species is inadequate to maintain balanced populations in the study area. In the present study, the presence of exotic weeds *Parthenium hysterophorus*, *Lantana camara*, *Eupatorium odoratum* and *Ageratum conyzoides* reflect the past disturbance events. Specifically *Parthenium hysterophorus*, *Lantana camara* and *A. conyzoides* indicates that this region still has been under the influence of some kind of disturbance. The annual/perennial herbs and forbs were significant and showing their medicinal importance. The changes in species composition are due to changes in edaphic factors in form of mineralization of soil organic matter (SOM), biomass decomposition and mine fire.

The study area is floristically very rich. The causes of rarity of some of the important plants were also recorded on the basis of interviews of local people and ground truth verification of the area. *Acacia catechu* (Kattha) and *Shorea robusta* are absent in wild condition because of overexploitation for 'Kattha', timber and fire fuel. Similarly, other species like *Adina cordifolia* (Haldu) for fire fuel and timber; *Andrographis paniculata* (Kalmegh), *Artemisia vulgaris* (Nagdaman), *Asparagus racemosus* (Satawar), *Dioscorea bulbifera* (Bilai Kand), *Gymnema sylvestre* (Gudmar), *Hemidesmus indicus* (Anantmool), *Pueraria tuberosa* (Patal Kumhara), *Rauvolfia serpentina* (Sarpgandha) and *Withania somnifera* (Ashwagandha) showed rare population because of overexploitation for medicinal uses and coal mining activities.

In nut shell, a systematic and comprehensive vegetation development programme is urgent for the mined out areas of Bastacola region. This will enhance the CO_2 sequestration and N_2 fixation, improve the soil characteristics, reduce soil erosion, and invite faunal diversity. Further, vegetation development will reduce the temperature rise at local level.

Table 9: Summary of adult plant species

S. No	Botanical Name	Family	S. No	Botanical Name	Family
1	*Buchanania cochinchinensis*	Anacardiaceae	11	*Cassia fistula*	Fabaceae
2	*Semecarpus anacardium*	Anacardiaceae	12	*Dalbergia sissoo*	Fabaceae
3	*Holarrhena antidysenterica*	Apocynaceae	13	*Hardwickia binata*	Fabaceae
4	*Stereospermum suaveolens*	Bignoniaceae	20	*Casearia elliptica*	Flacourtiaceae

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5	*Bombax ceiba*	Bombacaceae	21	*Lagerstroemia parviflora*	Lythraceae
6	*Boswellia serrata*	Burseraceae	22	*Soymida febrifuga*	Meliaceae
7	*Cassine glauca*	Celastraceae	23	*Ficus benghalensis*	Moraceae
8	*Anogeissus latifolia*	Combretaceae	24	*Nyctanthes arbortristis*	Oleaceae
9	*Terminalia tomentosa*	Combretaceae	25	*Zizyphus glaberrima*	Rhamnaceae
10	*Cochlospermum religiosum*	Cochlospermaceae	26	*Zizyphus nummularia*	Rhamnaceae
11	*Diospyros melanoxylon*	Ebenaceae	27	*Aegle marmelos*	Rutaceae
12	*Phyllanthus emblica*	Euphorbiaceae	28	*Chloroxylon swietenia*	Rutaceae
13	*Bridelia retusa*	Euphorbiaceae	29	*Tectona grandis*	Verbenaceae
14	*Albizia odoratissima*	Fabaceae	30	*Azadirachta indica*	Meliaceae
15	*Bauhinia racemosa*	Fabaceae	31	*Moringa oleifera*	Moringaceae
16	*Butea monosperma*	Fabaceae			

Table 10: Summary of annual/perennial herbs and forbs.

S. No.	Botanical Name	Family	S. No.	Botanical Name	Family
1	*Abrus precatorius Linn*	Fabaceae	27	*Cyprus rotundus*	Cyperaceae
2	Achyranthes aspera	Amaranthaceae	28	*Datura innoxia*	Solanaceae
3	Ageratum conyzoides	Asteraceae	29	*Desmodium gangeticum*	Fabaceae
4	Agave Americana	Agavaceae	30	*Putranjiva roxburghii*	Euphorbiaceae
5	Aloe Barbadensis	Liliaceae	31	*Euphorbia hirta*	Euphorbiaceae
6	Amaranthus spinosus	Amaranthaceae	32	*Euphorbia indica*	Euphorbiaceae
7	Andographis paniculata	Acanthaceae	33	*Evolvulus alsinoides*	Convolvulaceae
8	*Argemone mexicana*	Papaveraceae	34	*Hibiscus rosa*	Malvaceae
9	*Argyreia speciosa*	Convolvulaceae	35	*Hyptis suaveolens*	Lamiaceae
10	*Asparagus racemosus*	Liliaceae	36	*Lawsonia inermis*	Lythraceae
11	*Asphodelus tenuifolius*	Liliaceae	37	*Mentha spicata*	Lamiaceae
12	*Bacopa monneiri*	Scrophulariaceae	38	*Ricinus communis*	Euphorbiaceae
13	*Biophytum sensitivum*	Oxalidaceae	39	*Sida cordifolia*	Malvaceae
14	*Blumea lacera*	Asteraceae	40	*Solanum nigrum*	Solanaceae
15	*Boerhaavia diffusa*	Nyctaginaceae	41	*Tephrosia purpurea*	Fabaceae
16	*Calotropis procera*	Asclepiadaceae	42	*Xanthium strumarium*	Asteraceae
17	*Cannabis sativa*	Cannabinaceae			
18	*Capparis decidua*	Capparaceae			
19	*Carissa carandas*	Apocynaceae			
20	*Cassia tora*	Fabaceae			
21	*Chenopodium album*	Chenopodiaceae			
22	*Citrus medica*	Rutaceae			
23	*Clitoria ternatea*	Fabaceae			
24	*Coccinia grandis*	Cucurbitaceae			
25	*Convolvulus arvensis*	Convolvulaceae			
26	*Cynodon dactylon*	Poaceae			

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(h) Collection of Seeds of Native Species

1. Introduction:

The tropical dry deciduous type forest fragments in Bastacola region constitutes tree communities growing in warm to hot climates with a pronounced seasonality in rainfall and 2–6 months of drought each year, during which the ratio of potential evaporation to rainfall (E/R) is greater than one. The pronounced seasonality affects the patterns of seed production, germination, survival and seedling development. The favorable growth period in the dry tropics is usually restricted to the short rainy season when seeds are expected to germinate and seedlings established.

Dry forest is now frequently a mosaic of disturbed open-canopied, and relatively undisturbed close-canopied patches at several spatial scales which constitute a marked heterogeneity in terms of irradiation, temperature, moisture and rate of nutrient release from decomposing litter. The conversion of tropical forests into land for mining is a major threat to biodiversity. Large areas need to be brought back under forest cover in order to reverse the current trend of deforestation and to conserve biodiversity.

The natural colonization and successional process, however, may go in an undesired direction, as the species that arrive first by chance may persist and dominate the ecosystem for a long period of time leading to a further loss of biodiversity. Human interference may therefore be necessary for careful manipulation of initial composition of species to get the desired end-product of restoration. The successional process can be accelerated by introducing desired species through seeding, moving intact seed banks, and planting seedlings.

A consistent supply of quality seed is essential for the success of revegetation. There are many difficulties inherent in collecting native seeds. In many years, seed set may be poor due to climatic conditions, insect pests, grazing or fire. Some of the points to be considered when collecting seed are as follows:

- Consider establishing a seed orchard of species which are rare, produce limited seed, or have seed which is difficult to collect.
- Identify collection areas before the seed matures.

• Collect seed only when it is mature. Seed of some annual grasses and forbs can be shed within a day of ripening, which means that very close observation of seed-bearing plants is required. Differential ripening within one species or a single plant may necessitate several visits.

• Avoid seed or fruits that have been attacked by insects or show signs of fungal infestation.

• Some seed can be collected by mechanical means, including vacuum methods.

• When operating in forest areas, seed can often be collected from trees that have been felled for saw milling.

Some of the points which should be considered when purchasing seed are:

• Purchase from reputable seed merchants. This should avoid problems of incorrect identification of species, contamination with weed species and nonviable seed.

• Consider setting up long-term contracts with seed merchants for particular species. With the security of contracts, merchants can concentrate on improving their knowledge of the seed biology and location of the species, and build up inventories knowing that the seed will be purchased.

• Seed should be from known areas.

• Date of collection and conditions of storage should be known. Ideally, the germination rate of the seed should be given. The State Department of Agriculture or Primary Industry should certify seed of agricultural species.

Collecting Native Seeds

Methods of Seed Collection

For many native species, collection of wild land seed is the first step in a lengthy process of getting plant materials available for restoration projects. Successful seed collection involves planning ahead and monitoring for maturity. Suitable donor populations must be located and seed must be collected at the appropriate time once they are mature. The window for collection is usually variable among species, ranging from only a few days to several weeks or longer. If the collection is missed, collection must wait until the next year or growing season. Seed collections should be made in place to ensure that collection sites are not located within the mining areas, sensitive or federally listed plant sites; sites occupied by invasive plant species or other environmentally sensitive areas.

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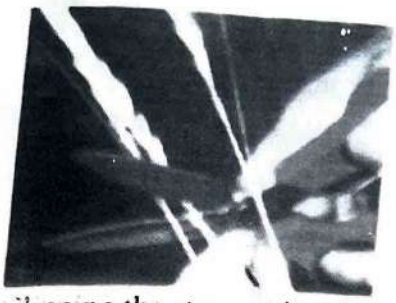
For each target species, collection sites are located using guidelines that ensure a representative sample of genetic variation is obtained. The specific number and distribution of collection sites will vary according to size, density, continuity of populations, and biology of the species sampled as well as the desired quantity of seed to be obtained. A general rule of thumb is to collect from a minimum of five collection sites at least 0.5-1.0 mile apart. A larger number of collection sites may be needed for inbreeding plant species to adequately sample genetic variation among populations. Within-population genetic variability is sampled by collecting from a large number of widely spaced or unrelated plant parents (30-50 or more plants are optimal).

Close monitoring is required in order to match the timing of seed collection activities. Multiple trips to a site may be required for determining when the seed is mature. Collecting at multiple times throughout the maturation period can help prevent inadvertent selection against either early or late maturing genotypes.

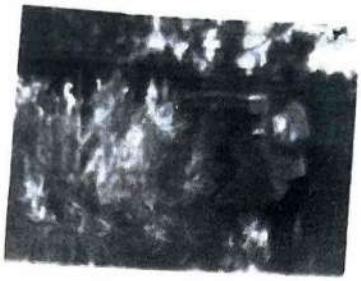
Field collection forms and GIS are used to document collection area location, along with other important details such as collection dates and the number, distribution and health of parent plants. In some states, third party certification services are available for tracking seed source identity of wild land collections, as well as for ensuring genetic integrity during the field seed production cycle.

2.1.1 Stripping, Shaking and Clipping

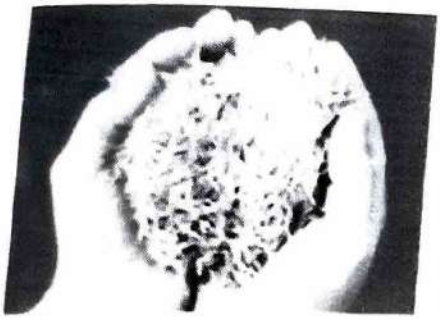
Seed collection methods will vary depending on the species. Grass seed is harvested by stripping or shaking it off the stem, or by clipping the stem with scissors or small scythes just below the spikelet (Fig 22). Shrub seed is picked or lightly beaten or shaken, using a tarp to catch the falling seed. For species that dehisce explosively, the entire inflorescence may be cut prior to maturity and allowed to dry in mesh or paper bags, or under netting. Ladders may be required for collecting seed from taller shrubs, or plants can be lightly pruned with telescoping pole pruners. For large-scale harvesting, specialty equipment and machines may be necessary. Whatever the method, collections should always be conducted in a manner that does not damage existing vegetation or other resources. Ideally, at least 50 percent of the seed crop at a given site is left intact to allow for natural recruitment and regeneration of the native population.



Clipping the stem with scissors



Hand-stripping



Seed Collection by Hand

Figure 22

Natural Seed Fall (Seed Traps)

Ripe seeds or fruits that fall to the ground when mature can be collected by laying tarpaulins or plastic sheets beneath the plants (Fig. 23). These sheets may be raised on purpose-built frames and funneled into a container to retain the seed. This technique is useful with low shrubs, especially those that are prickly (for example, Acacia sp.) but is unsuitable for species which release seeds that are dispersed by wind (for example, Eucalypts). The technique is normally unsuitable when seed collection times are unknown and seed formation may be missed. Drop sheets should not be used if there is a likelihood of seed from nearby plants (of the same or different species) contaminating the collection. Seed traps should be checked frequently, as the seed is susceptible to predation and rotting if left for too long. Take care when clearing a trap, as it is possible for snakes or biting insects to take up residence.

Another technique is to collect seed as it dehisces by enclosing the plant fully or partially in a breathable lightweight fabric. The fabric is tied around the plant stem or branch and the bag left in place. This technique is useful for small shrubs and bushes that are less than a metre in height.

especially at low plant densities and where seed is shed quickly or progressively over a period, or where shedding times are uncertain.

Both techniques suffer from insect attack (especially by ants) and wind can remove seed from drop sheets. Soil, leaf litter and other material must be sieved out to obtain pure seed and yields are often lower with drop sheets than by other collection methods. A drop sheet or enclosure bag, when left in place to collect seed, may free the collector for other work. For most collections you should not use plastic to store or transport seed or plant material as it causes the material to sweat and become mouldy.

Fig. 23

2.1.3 **Collection by hand**

The safest and most advantageous way to collect seed is when it is within hand's reach of a person standing safely on the ground (usually fruits below two meters in height). Wearing a bag with a wide rigid mouth allows the collector's hands to be kept free.

Seed from small plants low to the ground, or from low branches, may be easily collected by hand, though in some cases (such as with prostrate groundcovers) this process may be tedious and yield little seed. Try to collect from fruit in the middle or upper portions of the plant rather than the lower portions.

Plants with pods (Acacia): Using gloved hands, strip pods from branches into a belly bag or container, or shake the plant to dislodge seed or pods and collect them on a drop sheet placed under the plant.

For acacias for example, when the pods are brown and split along the margins, beat the branches with a stick. This will dislodge the seeds and pods, which will fall onto the drop sheet, which you can bundle for transport by tying its opposite corners.

Plants with woody fruits: In most cases remove small branches or, where necessary, remove individual fruit using ordinary secateurs. Seed release and extraction is often easier if the fruits are left attached to small branches – secateurs are very useful for this purpose.

Plants with fleshy fruit (Solanum): Pick fruit off the branches by hand when ripe.

Plants with seed heads. (*Sedges Bothriochloa, Dicanthium, and Stipa*): Strip seed heads off their stems by running a cupped hand along the seed heads in an upward motion, or cut them off with secateurs.

3.0 Seed Preservation and Seed Viability Test

Seed should be cleaned before storage, to remove as much debris and chaff as possible. Seed can be extracted from pods, capsules or other fruits by a variety of means. Processing methods are often species specific. Techniques include drying the capsules or pods in the sun light or in an oven, threshing using commercially available threshers, burning seed cones to release the seed, soaking fleshy fruits in water before recovering the seed, etc. Clean seed should be stored in dry, insect and vermin-proof containers. The containers should be clearly labeled with details of the species, date collected and collection location. Seed will often need to be treated with insecticide and fungicide before storage, to prevent insect and fungal attack.

Exposure to carbon dioxide for one or two days before storage has been shown to be an effective treatment against insect attack for many tropical native species. Storage areas should be fumigated regularly. Loss of seed viability during storage is common. Seed must be stored at low humidity (10% relative humidity) and low temperature. Temperature requirements may vary for tropical species.

Seed must be collected and stored in such a way as to ensure its viability. Overheating can kill seeds, and excessive heat and temperature fluctuations should be avoided. High moisture content during storage can also cause seed damage and loss of viability due to molds.

Dry tropical forest trees produce both orthodox and recalcitrant seeds. Orthodox seeds, such as those of *Acacia nilotica* and *Gmelina arborea*, can be stored at low temperatures for a longer duration without loss of viability. Many dry forest tree seeds, however, lose viability quickly under ordinary conditions and sometimes even in cool dry storage condition (Ray & Brown 1995). Seeds of *Shorea robusta*, which are common in both moist and dry tropical forests, remain viable for only 7–10 days (Saha *et al.* 1992). This short viability is due to a very high rate of moisture loss which is associated with loss of hair from the seed coat. Increased leachate

productivity and decreased fatty acid content due to ageing in certain seeds (for example *Dalbergia sissoo*) are other reasons for loss of viability and decline in germination percentage (Thapliyal & Connor 1997).

The proportion of viable seeds might depend on the time of seed collection. For example, collection of seeds of *Dalbergia sissoo* during the period November to July, yielded maximum numbers of viable seeds (Bangarwa *et al.* 1996). Temperature conditions and kinds of storage container found best for retaining maximum seed viability are known in certain Indian dry tropical species (Table 11). It is evident that a considerable amount of diversity exists with respect to optimal storage temperature. While a number of species such as *Albizia lebbeck* and *A. procera* need low temperatures (3–5 ^{0}C), others, including *Azadirachta indica* and *Dalbergia sissoo*, require higher temperatures (15–25 ^{0}C), and still others can withstand much wider ranges (Table 11).

Table 11. Reported optimal temperature and storage container to maintain maximum seed viability of certain dry tropical species. For most species optimal moisture content was 7–8%.

Optimal temperature (^{0}C)	Species	Storage container	Source
	Albizia lebbeck	Paper packet	Babley (1985)
	Albizia procera	Glass stoppered transparent bottle	Kandya (1990)
	Bauhinia variegata	Paper packet	Babley (1985)
	Cassia siamea	Glass stoppered transparent bottle	Kandya (1990)
	Ceiba pentandra	Air tight polyethylene bags	Kandya (1990)
	Dendrocalamus strictus	Silica gel or anhydrous CaCl2 in desiccator	Gupta and Sood (1978)
	Peltophorum ferrugineum	Glass stoppered	Kandya (1990)
	Azadirachta indica	Perforated polyethylene bags	Maithani *et al.* (1989)
	Bambusa tulda	Sealed polyethylene bags	Thapliyal *et al.* (1991)
	Eucalyptus deglubta	Closed container	Doran *et al.* (1987)
	Eucalyptus microtheca	Closed container	Doran *et al.* (1987)
	Dalbergia sissoo	Tin	Ashwathanarayana *et al.* (1996)
	Shorea robusta	Non sealed polyethylene bags	Purohit *et al.* (1982)
	Shorea talura	Non sealed polyethylene bags	Purohit *et al.* (1982)
	Acacia auriculiformis	Glass stoppered bottle	Kandya (1990)
	Cassia glauca	Air tight polyethylene bags	Kandya (1990)
	Holoptelia integrifolia	Sealed container with silica gel	Maithani *et al.* (1987)

4.0 Breaking of Seed Dormancy

Because seeds of most species of woody plants exhibit some degree of dormancy they may not germinate promptly under apparently favorable environmental conditions. Long postponement of seed germination often accounts for failure of adequate regeneration of forest stands. The ability of a species to remain dormant is particularly associated with the seeds of species from unpredictable environments and climates with variable rainfall trends. In contrast to tropical rain forest species, of which about 62% produce non-dormant seeds, as many as 76% of dry tropical forest species produce dormant seeds (Baskin & Baskin, 1998). Physical dormancy is most prevalent in dry tropical tree species and accounted for 67% of species producing dormant seeds, while only 23% showed suspected physiological dormancy. Percent and rate of germination in several species including *Acacia catechu, Albizia lebbeck, Bauhinia variegata* and *Cassia fistula* increased when embryos were decoated (Babeley & Kandya, 1985). Many pretreatments have been successfully used to break dormancy (Table 12). Although acid, hot water and mechanical scarification have been found suitable in a majority of species.

Dormant seeds suppress the negative demographic effect of reproductive failure and permit the species to avoid environmental conditions potentially unfavorable for seedling establishment. A hard seed coat allows endozooic dispersal (Teketay, 1997). Also, seed coat dormancy prevents the seed from germinating during isolated showers in the middle of a long dry season while permitting it during a sustained rainy season (Willan, 1985). Dormant seeds generally remain viable for long periods of time. The extent of dormancy even varies within a species, and as a result, individual seeds become permeable to water at different times which results in staggered seedling recruitment providing an insurance against spells of unfavorable conditions. The soil seed bank thus may produce seedlings continuously for several years due to different periods of dormancy. Passage through a digestive tract may enhance seed germination in various dry tropical species, for example, A. *nilotica* (Miller, 1995). Also, seeds of *Leucaena leucocephala* germinated to about 90% after a 240 h residence in rumen of cattle (Gardener *et al*., 1993). *Ficus benghalensis* showed higher germination of freshly-matured seeds when passed through the digestive system of a bird (Midya & Brahmachary, 1991).

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Table 12. Pretreatments yielding maximum germination in selected dry tropical specie

...ancy type	Pretreatment (showing best germination)	Species	source
	Acid scarification	*Acacia auriculiformis*	Kandya 1990
		Acacia feruginea	Thapliyal *et al* 1998
		Acacia mellifera	Jerlin & Vadivelu 1994
		Acacia nilotica	Adeola & Dada 1986
		Acacia pseudo-eburnea	Karihaloo 1984
		Acacia tortilis	Karihaloo 1984
		Erythrina burana	Teketay 1994
		Peltophorum ferrugineum	Kandya 1990
		Terminalia bellirica	Sharma *et al* 1992
...ical ...mancy	Hot water treatment	*Ceiba pentandra*	Kandya 1990
		Tamarindus indica	Srimathi *et al* 1990
		Prosopis juliflora	Ashwathanarayana *et al.* 1996
		Dalbergia sissoo	Ashwathanarayana *et al.* 1996
		Hardwickia binata	Ashwathanarayana *et al.* 1996
		Erythrina brucei	Teketay 1994
		Acacia catechu	Karihaloo 1984
		Acacia decurrens	Karihaloo1984
		Acacia leucophloea	Karihaloo 1984
		Albizia saman	Srimathi *et al.* 1990
		Albizia odoratissima	Ashwathanarayana *et al.* 1996
		Anogeissus latifolia	Ashwathanarayana *et al.*, 1996
	Mechanical scarification	*Albizia procera*	Kandya. 1990
		Cassia glauca	Kandya. 1990
		Leucaena leucocephala	Babley & Kandya. 1985
...iological ...mancy	Ca(OCl2) treatment	*Ailanthus excelsa*	Jacqueline *et al.* 1990
	Thiourea treatment	*Albizia lebbeck*	Roy1992
	KH2PO4 treatment	*Azadirachta indica*	Kumaran *et al.* 1996
	KNO3 or CaOCl3	*Casuarina equisetifolia*	Maideen *et al.* 1990
	Exposure to gamma-rays	*Tectona grandis*	Duyasagar & Kothekar. 1982

...l Seed treatments

...s of some species requires pre-sowing treatments. Germination of most native legumes and a ...mber of other species is enhanced by heat treatment. These species are commonly immersed in ...ling water for 30 seconds to five minutes before sowing. There is evidence that the ...mination of some species, which normally have low germination rates, is enhanced by ...eatment with smoke from burning plant litter. These species can either be treated directly with ...oke or with water, which contains the soluble components of smoke. Agricultural legume seed ...ould be inoculated with the appropriate rhizobia. This is usually done in conjunction with lime ...leting, which a simple procedure is easily carried out on-site. Rhizobia inocula and details of ... pelleting procedure are readily available from seed merchants. Rhizobia, which form ...iations with native legumes, seem tolerant of soil disturbance and storage, and will often

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...fect native species after restoration. However, inoculation may be necessary if infection ...t readily occur after restoration, or when establishing native legumes in overburden. ... or subsoil. This will involve isolating native rhizobia, growing them on suitable media, ...hing them to the seeds. While this is a relatively simple procedure, specialist guidance ...bably be needed. Suitable techniques for inoculating large quantities of seed with ...hizal fungi are not yet available.

...edbed preparation

...eparation of a suitable seedbed is an important factor in the successful establishment of ... from seed. The objective in creating a seedbed is to place the seed in a suitable place for ...nation. The seed must be in good contact with the soil to ensure that it can take up water ... and the soil must be well aerated. The soil around the seed must be loose enough for the ...g to grow up through the soil and allow root growth.

...edbed should be free of weeds. Care should be taken not to over-prepare the soil, as a ... surface provides more niches for the seeds and encourages infiltration of rain. A variety of ...ional agricultural equipment can be used to prepare seedbeds. Soils should be cultivated ... moisture levels are adequate; to avoid powdering, but not so wet that compaction and loss ...ture becomes a problem. If seed is to be broadcast, it should be done before the seedbed ... chance to consolidate and form a surface crust.

...g machines generally cultivate as well as sow where the topsoil contains significant ...ies of seed of desirable species; care must be taken not to disturb the soil after these seeds ... started to germinate, as this will cause a substantial reduction in plant establishment. ...es can improve the microenvironment for seed germination and establishment.

...eding methods

... can either be broadcast on to the surface of the soil or drilled into the soil using some form ...hanical seeder. Target densities for each of the seeded species, and an estimate of how ...ed is required to obtain these densities, need to be established. The seeding technique ... will depend on local factors, such as topography, the size of the area being restored and ... of seed. Various machines have been developed for sowing native species, but in many ...broadcasting by hand is still the best option. Mechanically sowing native seeds is difficult ... of the large range in seed size, which makes an even coverage of seed hard to obtain. In

addition, many native seeds have awns or other appendages, which create problems for mechanical seeding. Care must be taken not to bury the seed too deep for successful establishment when cultivating after seeding. Seed can also be applied by hydro seeder, hydro mulching. Hydro seeders are a convenient way of seeding steep areas. Aerial seeding is used to seed large areas, especially when the soil is too wet or the slope too steep to use tractor-mounted seeders.

Timing of seeding can also be important for successful revegetation. In most cases, seed should be sown immediately prior to the expected onset of reliable rains, or after the start of the rainy season. Native seeds may require specific moisture and temperature conditions to germinate, so that they establish at the optimum time of the year for survival. This need for multiple cues may allow seed to be sown well before it would normally be expected to germinate. Seed theft by ants, birds and small mammals is a potential problem when seed is sown early, although less likely than in areas of native vegetation, because of the impact of disturbance on fauna populations.

4.4. Erosion control

Control of erosion is important both during mining and in the restoration programme. A major objective of restoration should be to establish an adequate cover of vegetation to stabilize the site and prevent or control erosion. Until an adequate cover of vegetation has been established, it is imperative that provision be made to control erosion from disturbed areas. Soil particles can be lost in three ways; they can be blown away, washed away, or the whole surface may slip away or slump. Soils containing more than 60% unaggregated sand grains and individual granules in the size range 0.1–0.5 mm are very susceptible to wind erosion; those with less than 40% are not usually susceptible.

Before a vegetation cover is established, wind erosion can be controlled by three basic methods:

- protecting the soil surface with a mulch of natural or manufactured materials;
- maintaining the soil in an erosion-resistant condition (i.e. moist, or with a compacted surface crust or a cloddy structure); and
- reducing wind velocity across the disturbed areas by establishing wind breaks.

Erosion by water involves two stages. First, large soil aggregates are broken up into finer particles and, second, these fine particles are transported down slope. The loss of soil through

...r erosion is a function of the erosivity or intensity of the rainfall, the erodibility of the soil, ...area of catchment, the length and gradient of the slope, the amount of vegetation cover and ...erosion control measures undertaken. Soil erodibility depends on soil texture, structure and ...degree to which soil particles disperse when in contact with water. Soils with high levels of ...changeable sodium tend to disperse readily.

...sures to protect the soil from water erosion should be carried out on a catchment basis. ...nage from external catchments must be controlled by diversion channels or holding ...ctures such as banks, drains or dams. Water leaving the site or diverted around the site must ...be controlled. It is necessary to discharge this water so that it does not cause erosion or carry ...diment downstream. In this critical situation, seeding with appropriate grasses and forbs will ...duce the water flow and impact of raindrops on the soil surface, consequently maintaining the ... an erosion-resistant condition.

...Seeding per hectare:

...eed rate should be determined based on the optimum number of plants required in unit area ...re or hectare or sq ft or sq m) for seedling establishment. Select species based on the ...vegetation goals, climate, soils, and establishment characteristics. Seeded species should ...clude a minimum of a fast growing grass, a sod-forming grass, a bunchgrass, and a legume. ...st growing, non-persisting annuals or short-lived native perennials, drought and heat resistant ...erennial grasses can be seeded to protect soil. The seed mix is applied at about 2 kg per hectare ...the restoration of bauxite mining in the Jarrah forest of Western Australia. In coal mining ...eas of Northern Great Plain, the seeding rate is 20 kg pure live seeds/ha or 500 seeds/m^2. ...eeding rates must provide for a minimum of 430 pure live seed (PLS) per square meter (40 ...S sq ft) or at least 13.4 kg PLS per hectare (12 lbs PLS/acre). Seeding rate is more dependent ...on seed weight and seedbed characteristics. The amount of seed required per unit area depends

- Optimum plant stand required per unit area
- Plant type i.e. tall or short plants
- Weight of seed
- Quality of seed in terms of germination.

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In light of above facts, there is no thumb rule for seeding per hectare. Therefore, it is necessary to carry out test on rate of seed germination in Bastacola region to approximate the seeding per hectare.

(d) Seeding of Grass and Legume Mixtures as a Initial Colonisers for Erosion Control

Most coal-bearing lands in the Jharia Coalfield were forested prior to mining. The region's forests had have predominantly mixed deciduous plants. These forests provide many benefits to landowners and the public. Timber, fodder and fuel woods were perhaps the most tangible benefits along with flow of filtered water from forested watersheds into regional streams is another vital benefit provided by the region's forests. Forests also supported the wildlife, recreational opportunities and an aesthetically pleasing environment.

Surface mining completely removes the forest. Restoring forests on surface-mined land is challenging but it can provide low-cost and timely reclamation and restored forests can provide economic returns to landowners. Further, the reforestation procedures recommended below are designed to accelerate forest succession while providing land stabilization and erosion control. A combination of grasses, legumes, nurse shrubs and trees are established more or less simultaneously (Fig 24). Each plant type serves a specific reclamation function.

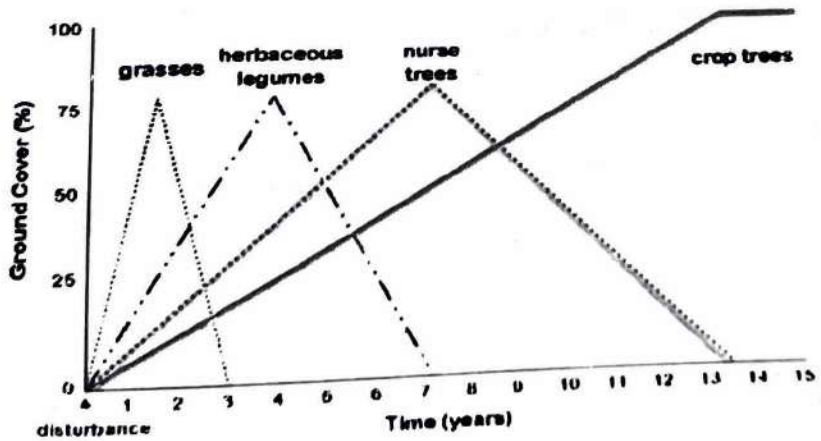

Fig 24. Reforestation seeks to stimulate natural processes known as forest succession. All vegetation types are established during reclamation. As time passes, grasses and legume groundcovers yield to fast-growing pioneer species and nurse trees, which are themselves overtopped by commercially valuable crop trees as the forest grows and matures.

...s reforested using these guidelines ... grasses emerge first to quickly stabilize ... soil surface. Grasses then yield to legumes when applied nitrogen is minimized. The ... legumes allow trees to become established and grow before ... covering the ground. The legumes enrich the site and eventually give way to the tree ... Nurse trees and shrubs condition the site for the growth of large tree species. This process ... matching plant species to site conditions or matching plant species for their compatibility with ... other in space and time, and managing tree stands to accomplish certain objectives as they ... develop lead to erosion control (Fig 25). Moreover, the litter accumulation on soil surface ... the water holding capacity of the barren waste materials dumped in coal mining areas.

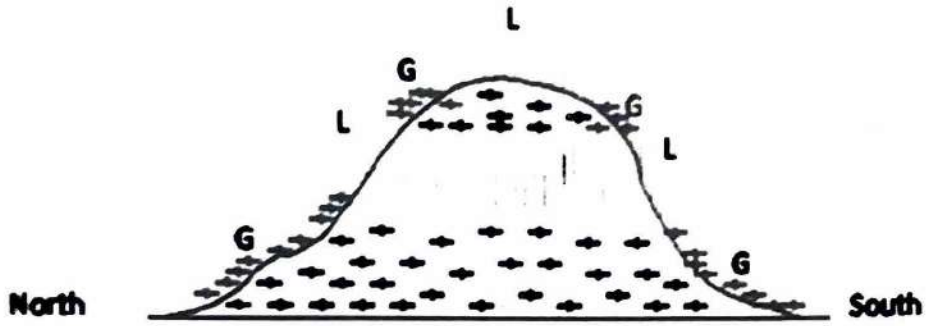

Fig 25 Seeding pattern of grasses and legumes along north and south facing slopes on overburden dumps. The north and south facing slopes are responsible for variation in microclimate and plant diversity. Hence, seeding must be according to natural distribution of plant species in order to achieve secondary succession. L = Legume G = Grass

In Fig 25, top surface is seeded with legumes because symbiotically fixed nitrogen will support the seeded grasses in terms of nutrient supply during monsoon season. This alternate seeding of legumes and grasses further enhance the secondary succession. The usual reasons for using legumes in grass mixtures are to add length of green growing season, add forage quality, and to provide some nitrogen source from the legume. Most leafy legumes are best quality litters and may add essential nutrients during colonization of overburden dumps. In due course of seeding, habitat quality of older stands of grasses can be upgraded by inter seeding with legume mixtures. Grasses and legume mixtures will be inoculated for better establishment and persistence of other

native species. In nut shell, seeding of grasses and legume mixtures as a initial colonisers for erosion control also support seed germination of other native species.

Table 13. List of grasses and legumes act as initial colonizers in mined out areas.

S. No.	Botanical Name	Family
1	*Abrus precatorius*	Fabaceae
2	*Cassia tora*	
3	*Clitoria ternatea*	
4	*Desmodium gangeticum*	
5	*Tephrosia purpurea*	
6	*Xanthium strumarium*	Asteraceae
7	*Cynodon dactylon*	Poaceae
8	*Calotropis procera*	Asclepiadaceae
9	*Datura innoxia*	Solanaceae
10	*Sida cordifolia*	Malvaceae
11	Achyranthes aspera	Amaranthaceae
12	Aloe Barbadensis	Liliaceae
13	*Boerhaavia diffusa*	Nyctaginaceae

(j) Design for construction of Check Dam, Retention Wall based on contour maps to prevent the sliding down of OB materials

Check Dams:

A check dam is a small, temporary or permanent dam constructed across a drainage ditch, swale, or channel to lower the speed of concentrated flows for a certain design range of storm events. Reduced runoff speed reduces erosion and gullying in the channel and allows sediments and other pollutants to settle out. They are inexpensive and easy to install. They may be permanent if designed properly and can be used where it is not possible to otherwise divert flow and stabilize the channel.

The Chatkari Jore originates from Bastacola and Bera, from North of the study area, flows through Goshala and Maji Basti, to meet near Bhera Kata. Later a stream from Bera Officer and Staff Colony, flowing through Dobari, meets the Chatkari Jhore at R.O.C.P. Quarry to further flow from Ghanoodih, XI/XII Seam towards X Seam Quarry, Kujama. As the Chatkari Jhore traverse through the study area from North to South it passes through the OB dump areas in Bera and Ghanoodih. Due to erosion and surface run-off during rainy season, the silt load of the jhore may be very high. To arrest the silt load from the study area, check dams may be built across the Chatkari Jhore, at suitable locations, to arrest the silt.

Check dams can be constructed of stone or pebbles. Since the stone check dams will be used in grass-lined channels care should be taken to remove all the stone from the dam when the dam is removed. This should include any stone which has washed downstream. The maximum height of the check dam should be 2 ft (0.6 m) with a 4-foot base and 2:1 side slopes. The center of the check dam must be at least 6 in (152 mm) lower than the outer edges. The stones/boulders used for the construction of check dams must be 8-12 inches in size. The rock is placed either by hand or mechanically, but never just dumped into the channel. The dam must completely span the ditch to prevent wash out. The typical cross-section of the check dam is presented in Figure 26.

The spacing between dams is dependent on the height of the check dam, and the grade of the waterway. In order to protect the channel between the check dams, the devices should be spaced such that the elevation of the toe of the upstream check dam is equal to the elevation of the crest of the downstream check dam. This allows the water between the check dams to pond, resulting in a greatly reduced flow velocity. Based on the above criteria, the proposed locations for check dams in the study area are shown in figure 28.

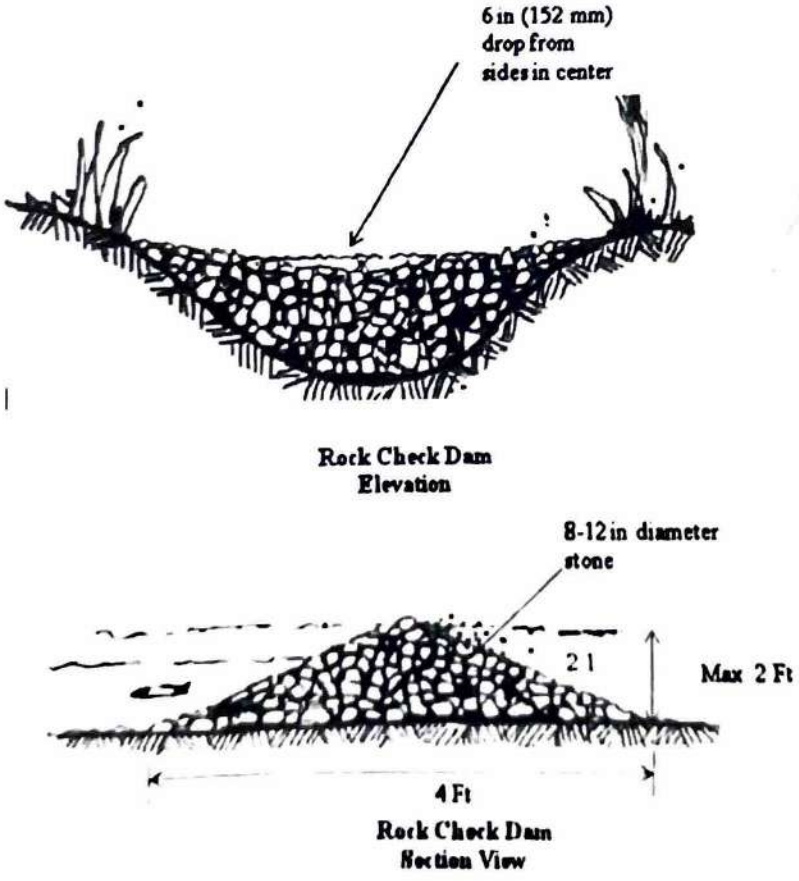

Figure 26: Typical Cross-Section of proposed Check-Dam

Construction of Toe Barriers

Based on the contour maps and plan of the study areas, the OB dumps are situated in Bera, Bastacola, Ghanoodih and Kuya quarries. These OB dumps are situated near the edge of Chalkari Jhore and may impact the surface water bodies due to erosion of the dumps as well as can impact the drainage pattern in case of sliding of OB materials. Hence it becomes necessary to construct toe barriers in the vicinity of water bodies to prevent sliding and erosion of OB dumps.

Toe barriers, will be constructed of dry stone masonry, parallel to the toe of the dumps, but located 6 to 10m away from the base of the toe. These barriers are not designed to serve the purpose of retaining walls, for which a much more massive and costly structure will be required. The barriers are intended for containing the finer particles of run-off from spreading onto adjacent areas. The stonewall must be 2.5 m high, width of the foundation must be 4 m, the width at the base should at least be 3m, and the slope of the wall on the outer or down-hill side should be flatter (1 in 1) to provide a proper batter as indicated in sketch shown in Figure 27.

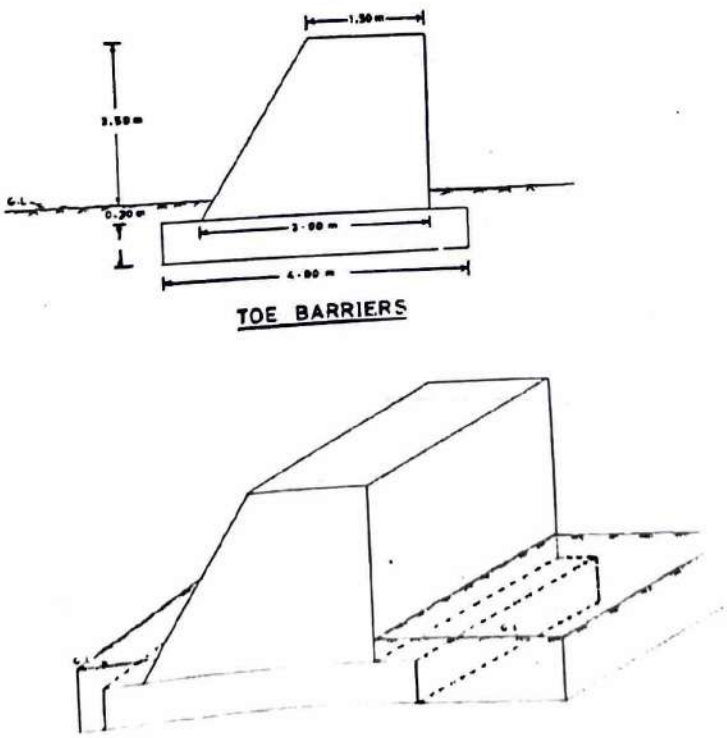

Figure 27: Typical Cross-Section of Toe Barrier

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The toe barriers must be located in the areas adjacent to the surface water bodies encircling the toe of the OB dumps. The toe barriers must not be erected in the active areas to facilitate the dumping of OB materials. The locations of toe barrier in the study area are depicted in Fig. 28

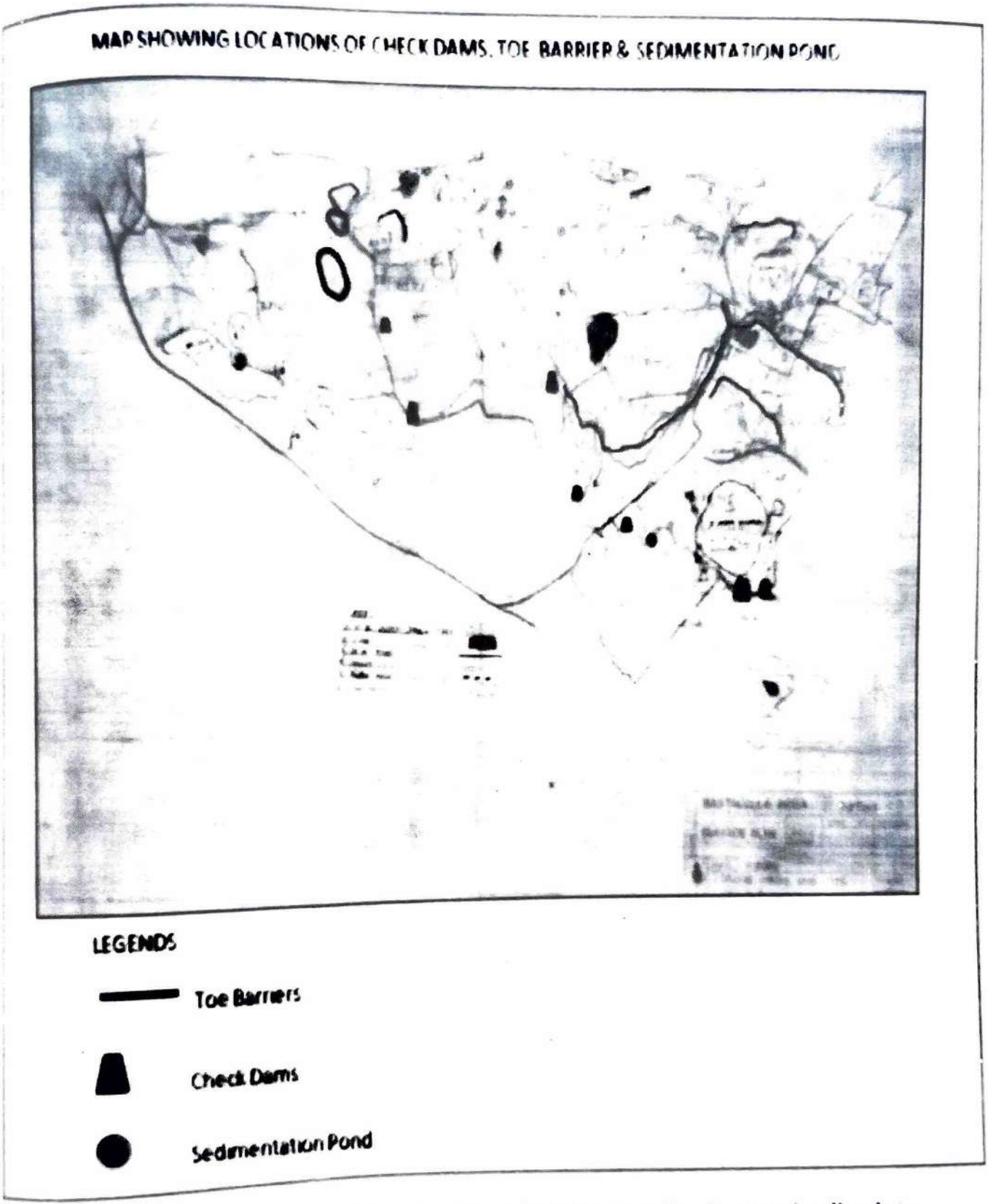

Figure 28: Proposed locations of Toe Barriers, Check Dams and Sedimentation Ponds in the study area

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Preparation of Phased Reclamation Plans

Survey of the reclamation sites

Detailed survey of the reclamation site was carried out and location of over burden and coal dumps are shown in figure 29. Vegetation cover and dumps are also studies through remote sensing image and shown in figure 30.

Figure 29 Location of overburden dumps and coal dumps in the study area

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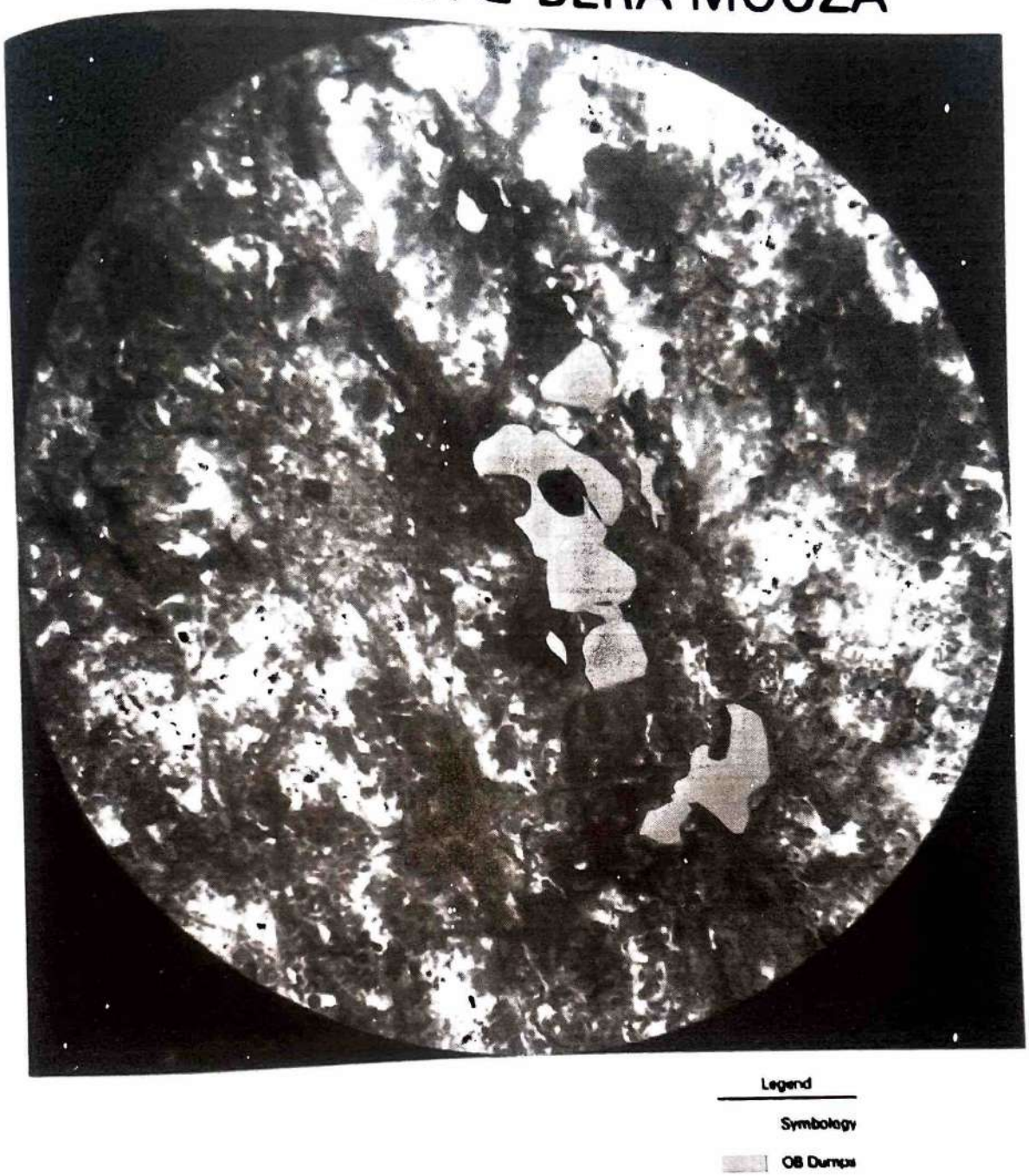

Figure 30 Locations of OB dumps in Ghanoodih & Bera Mouza

b) Computation of Overburden Dumps

Technical details of mining in the study area are shown in table 14. There are two opencast projects Ghanoodih and Bera with life expectancy of 6 and 3 year respectively.14.47 Mm^3 and

1.08 Mm^3 over burden will generate from both mines Ghanoodih and Bera respectively. As per mine plan Ghannodih OCP will go upto a depth of 94m while Bera OCP will go upto a depth of 22m. Reclamation schedule of Bera and Ghanoodih is shown in Table 5 & 16.

Table 14 Technical Details of Mining

Name of the Project	Ghanoodih		Bera		Dobari
Method of Mining	OCP	UG	OCP	UG	UG
Total Reserves (MT)	6.65	14.35	0.36	5.10	19,66
Mineable Reserves (MT)	6.65	14.35	0.36	2.18	9.00
Capacity (MTPA)	1.10	0.72	0.20	0.175	0.24
Life of the project (Years)	06	20	03	12	37
Mineable reserves Forest land (MT)	6.65	13.85	0.06	0.51	3.86
Volume of OB (Mm^3)	14.70	-	1.08	-	-
Grade of coal	W-III	C,D & W-1	C	C,D &W-I	C,D, W-I W-II
Seam to be worked	V,VI,VII, VIII,IX,X	1,II,III, IV	III	1,II,III	I,II,III IV
Seam thickness (m)	13-16	3.6 – 8.0	6-7	3.6-6.7	2.1-6.4
Dip of the seam (°)	4-5	8-9	7-8	7-8	5-8
Average stripping ratio	1:2.23	-	1:3	-	-
Maximum depth (m)	94	-	22	-	-

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c) **Formulation of reclamation strategies**

Reclamation shall proceed in a contemporaneous manner and shall include backfilling, regrading and stabilizing exposed high walls in inactive quarries with appropriate drainage control. Conversion of some quarries to ponds to cater the water requirement of the surrounding villagers, along with promoting pisciculture. Trees shall be planted on affected land with native and commercial species as per provided in section 10

Table : 15 Reclamation/Plantation Schedule - Bera area

Year of Dumping	Volume in MM^3	Area in Ha	PLANTATION Nos.
1st	0.36	4.30	6500
2nd	0.36	4.30	6500
3rd	0.36	2.92	4200
Total	**1.08**	**11.52**	**17200**

Note - Reclamation should be done on the left out portion of the mining work done.

Table 16 : Reclamation/Plantation Schedule – Ghanoodih area

Year of Dumping	Volume in MM^3	Area in Ha	PLANTATION Nos.
1st	2.25	3.21	5000
2nd	2.25	3.21	5000
3rd	2.25	3.21	5000
4th	2.25	3.21	5000
5th	2.25	3.21	5000
6th	2.25	3.21	5000
7th	1.35	1.93	3500
Total	**14.70**	**21.19**	**33500**

Note - Reclamation should be done on the left out portion of the mining work done

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Table: 17 DETAILS OF MINING AND THE PROGRES MADE ON RECLAMATION ON THE BASIS OF PROGRES REPORT FOR GHANOODIH COLLIERY (UNDER GROUND + OCP MINE)

	Target of Coal prod. (MT)	Actual prod. of coal (Mt)	Target of OB (Mm^3)	Actual OB (Mm^3)	Backfilling (Ha)	Top soil laying (Ha)	No. of trees	Survival of trees	Area of plantation (Ha)
	0.528	0.768	NA	NA	2.79	-	-	-	-
	0.635	0.668	NA	NA	2.41	-	-	-	-
	0.630	0.509	1.350	1.128	1.87	-	-	-	-
04	0.810	0.772	1.526	1.463	2.43	-	-	-	-
05	0.695	0.644	1.750	1.645	2.72	-	-	-	-
06	NA	0.886	NA	2.228	3.71	-	-	-	-
07	NA	0.792	NA	2.508	4.18	-	-	-	-
08	NA	0.928	NA	1.670	2.79	-	-	-	-
09	NA	0.751	NA	2.572	3.96	-	-	-	-
00	NA	0.740	NA	2.374	3.65	-	-	-	-
01	0.860	0.806	3.100	2.192	3.36	-	-	-	-
02	0.800	0.812	2.600	2.132	3.27	-	-	-	-
03	0.875	1.039	2.660	2.203	3.36	3.20	900	186	2.80
04	1.050	1.102	2.170	2.486	3.82	3.60	315	348	3.45
05	1.100	1.133	2.650	2.682	4.18	4.01	360	252	3.80
06	1.300	1.306	3.275	2.930	4.18	4.10	380	271	3.45
07	1.450	1.451	3.600	3.328	3.21	3.00	210	198	2.62
08	1.250	1.263	3.070	2.419	3.21	2.90	501	496	2.80
09	0.610	0.703	1.525	1.600	3.21	2.92	500	490	2.90
10	0.71	0.585	1.16	0.960	1.75	-	-	-	-

Final voids created due to Bera and Ghanoodih OCP should be properly graded, dozed, compacted. Land must be available for vegetation again. During mine fill atmost care should be

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...ken for segregation of carbonaceous material. Presence of segregation material in any mine ...d and dump may lead to fire again. After comple reclamation site may be handed over to ...ginal owner of land as per mine plan. Detailed reclamation plan for Ghanoodih mine is ...vided in figure 31

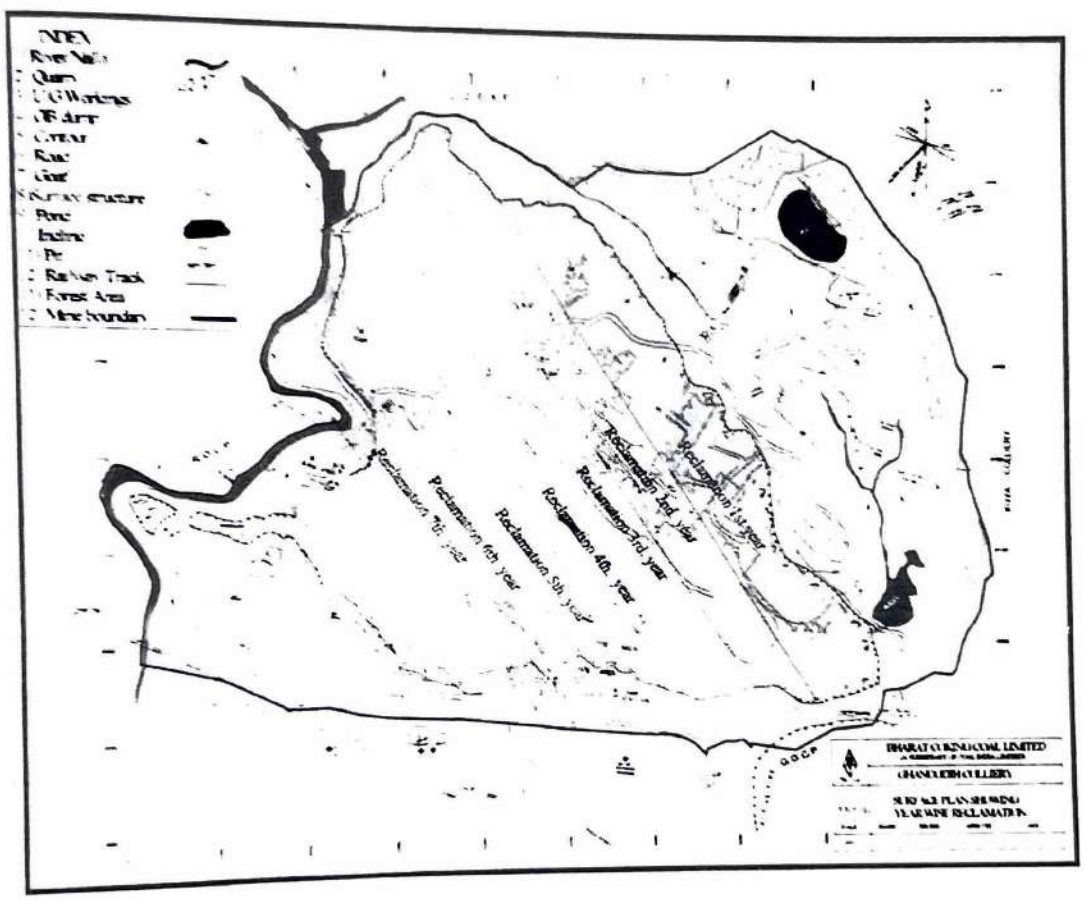

Figure 31: Reclamation Plan of Ghanoodih Mine

10. Comprehensive Soil Conservation Plan and Measures

Soil conservation in its widest sense includes not only control over erosion but an those measures like correction of soil defects, application of manures and fertilizers, proper crop rotations, irrigation, drainage etc. which aim at maintaining the productivity of the soil at a high level. In this sense, soil conservation is closely allied to improvement of land use in general.

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The most important cause of erosion is destruction of forests and other vegetation from sloping lands, desert margins and other areas susceptible to erosion. Vegetation acts as a protective cover against the forces of wind and water, protecting the soil from being washed or blown away and preserving the physical and hydrographic balance of nature. Forests-for instance, provide the most effective protection against erosion on hill slopes. They break the force of run-off by impeding the flow of rainwater down the slopes and by absorbing large quantities of it in their dense mat of undergrowth.

In the Ghanoodih and Bera Projects of Bastacola Area, the top soils and sub-soils were disturbed and devoid of nutrients and microbial activities compared to vegetation dominated areas (discussed in Section 6 D).

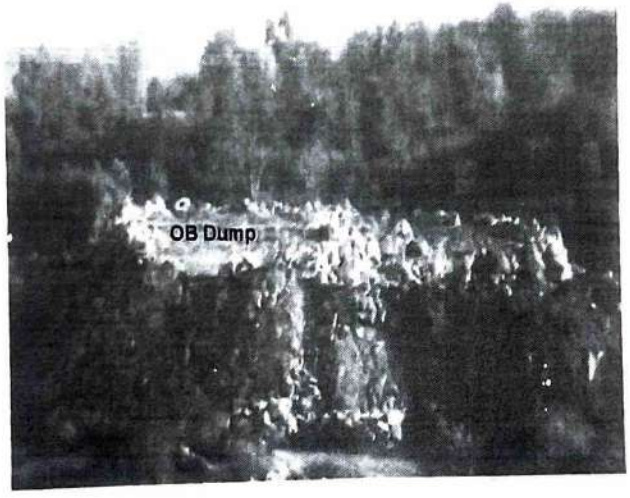

Fig 32. The stock piling of OB dumps in the study area.

In Fig 32, the OB dumps are deposited in a manner that is of no more use in future due to erosion and contamination particularly in monsoon season. Further, they may be responsible for sliding in the rainy season. Finally, partial or whole dumping pattern will be detrimental to the ecosystem structure and function.

In view of above mentioned facts, the soils are affected by various mining activities. In an ideal open cast mining situation, soils are separately handled and stored with due precautions so that when required in reclamation, soils can be laid back (Fig 33).

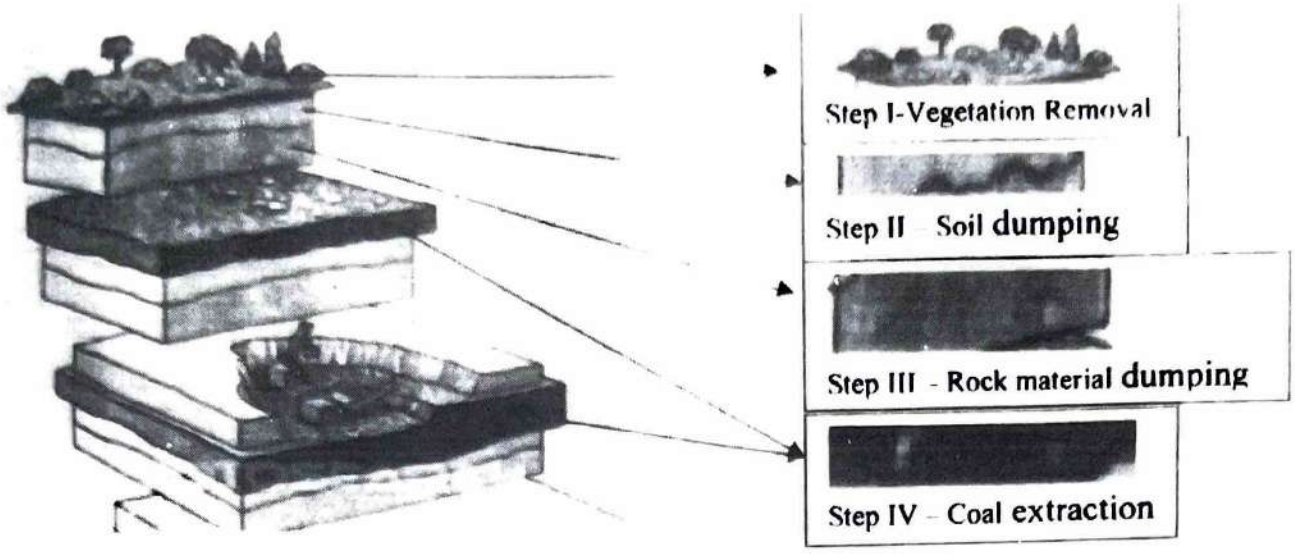

Fig 33. Cross section of coal mining and eco-friendly handling of earth sections.

The important aspects of soil conservation plan outlined here under:

1. Soil horizons should be clearly defined that is the thicknesses of top soil and sub soil layers in the area should be determined as accurately as possible.

2. Characterization of soils for the following properties in *in situ* conditions:

a. infiltration capacity
b. grain size distribution
c. pH and conductivity
d. bulk density
e. moisture retention capacity
f. field capacity
g. wilting capacity
h. soil texture
i. plastic limit
j. organic matter
k. macro and micronutrient status
l. micro flora and fauna present.

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Before removal of soils from the areas designated for mining all the vegetation from over the soils is to be removed. In ideal situations it would be appropriate to replant this vegetation in suitable areas as far as possible.

While removing the soils, the top soils should be removed separately and the sub-soils separately. In the removal and handling of the soils the following physical and biological control measures should be taken:

a. The soils should be removed by scrapping not by blasting, and while removing adequate moisture is to be maintained in the soils.

b. The soils should be stock-piled only when it is impractical to promptly redistribute such materials on the regarded areas.

c. The area designated for the stock-piling should be cleared of all vegetations. The area should be located such that it is assessable when it is required to take soils from the stock- piles for relaying. There should not be any chance of water logging of this area and it should be away from fires.

d. Stock-piled materials should be selectively placed on a stable area, not distributed, and protected from wind and water erosion, unnecessary compaction and contaminants which lessen the capability of the soils to support vegetation when redistributed.

e. A vegetative cover, of grasses of very shallow roots may be developed immediately after a portion of the stock-piled materials is in for stability and to keep important nutrients from breaking down and leaching out. This would also help in minimizing soil erosion.

f. Time to time stock-piled soils should be sampled and characterised so as to assess their degradation, if any.

g. When it is time to use the stock pill soils to bee re-laid, it is advisable to remove the grasses from over the stock pile and characterize the soils so that necessary amendments are done before and, may be during relaying.

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h. The area where the soils are to be re-laid should be suitably prepared to insure stability of the re-laid soils.

The characteristics of the soils listed earlier, should be ascertained adapting standard methods. With proper care in mining and reclamation planning it should be possible to compute the total quantities of the soils that are required to be handled, stock-piled and relaying.

(a) Physical Methods:

Controlling Wind Erosion

Windbreaks are strips of trees and other vegetation that slow the flow of the wind, reducing wind erosion, evaporation, and wind damage to plantation. They are sometimes referred to as shelterbelts, although this term usually implies a wider strip of vegetation, which incorporates more rows of trees and shrubs than are usually found in a windbreak. Windbreaks have an especially high potential in OB areas where early colonizers can grow.

OB Stabilization

OB stabilization is an important aspect of revegetation and conservation activities in coal mining areas. Shifting and blowing sand causes great damage to farmland, buildings, installations, and roads. The best protection against drifting or blowing dust is to prevent them from being picked up by the wind and becoming airborne. Conservation of existing grass and other vegetation cover is necessary to hold the dust in place.

Controlling Water Erosion

The most likely, logical place to use trees and shrubs to halt erosion caused by water is across slopes, particularly where hillside plantation is practiced. Properly maintained trees and shrubs, planted in combination with grasses and other vegetation, can effectively control surface runoff, thereby reducing soil losses. One successful technique involves establishing parallel vegetation bands along contour lines. These contour strips will reduce runoff from the slopes above if they are designed and maintained to ensure a dense, multi-layered permanent ground cover. The ground surface is protected by successive layers of litter, grasses, other ground plants, bushes, and trees. A dense vegetation belt will not only stop or slow down runoff, but will also trap soil particles suspended in the water that have been removed from the more exposed areas between the strips.

Biological Control Of Soil Erosion

manent vegetative cover is the best protection for soil. The moment vegetation is destroy condition becomes favorable for soil erosion. Bare ground allows four times more soil as compared to permanent plant covered ground. In this method, try to plant such species that are capable of holding soil strongly and can survive in very adverse soil condition. So land system should be properly implemented. The main principle of biological control is to cut high speed of water and conserve water within the soil. In biological control following that can be adopted.

Mulching: mulching is the covering of the soil with organic residues such as straw, maize, stalks etc. these cover protects the soil from the rain drop impact and reduces the velocity of runoff and wind.

- Cover crop: they are grown as a conservation measure either during off season or as ground protection under trees.
- A Multiple cropping: the aim of multiple cropping is to increase the production from the land whilst providing protection of the soil against erosion. It includes:
    i. Rotation: growing different crops consequently in rotation reduces erosion as high rate of soil loss under row crop is counteracted by low rates under other crops.
    ii. Strip cropping: row crops and protection effective crops (legumes and grasses) are grown in alternate strips aligned on the contour or perpendicular to the wind. It is suitable for the slope of 30°.

2. High density cropping: it is used to try to obtain the same effects for a monoculture that multiple cropping achieves for two or more crops.
3. Agro forestry: Trees can be incorporated within a farming system by planting them on terraces, contour bounds and as ornamental around the homestead. This reduces soil erosion and provides additional needs to the farmers.
4. Shifting cultivation: an area: forest is cleared by slash and burn, and cultivated with crops for a second year before being allowed to revert to scrub and secondary forest. This practice will maintain soil fertility and reduce soil erosion as long as the low ratio population to land area is maintained.

Rotational grazing: for controlling erosion on grasslands, rotational grazing is practiced i.e. The stock is moved from one pasture to other, to give time for the grass to recover.

8. Proper forest management: though erosion under forest cover is less, sever erosion may result when the hill forest area is subjected to clear felling, selection or shelter wood system should be adopted.

9. Reforestation / afforestation: vegetations play the major role in erosion control on gullies areas and landslides. So forestation programs should be prioritized.

10. Soil management: it maintains and improves fertility and structure of soils. High fertile soil results in high productivity, good plant cover and therefore in conditions, which minimize the affect of erosive agent nevertheless extensive soil, management is not viable for land use other than agriculture. It includes;

    i. Increasing organic matter content: organic matter improves the cohesiveness, water retention capacity and structure of soil. Green manure, straw etc should be added as organic substance in top soils though tree litters maintain adequate organic content in forest soil.

    ii. Using soil stabilizers: it consists of organic by products, synthetic polymers and polyvalent salts. The former two bind the soil particles into aggregates and latter bring about flocculation of the clay particles. However soil stabilizers are expensive for general forestry use.

11. Continued covering: Once the land is naked there is high possibility of soil erosion. Hence the land should be kept covered all round the year.

12. Inter cropping: In this method, the spaces among the tree species are covered with agriculture crops, which help in soil and water conservation.

13. Mixed cropping: In this system two or more than two crops are raised in the same land and in the same time. The benefit is that due to different kind of roots, soil is protected more perfectly.

14. Wind breaks: Windbreaks are usually used in plain areas where the wind moves rapidly and forcely which detaches soil particles causing soil erosion. In this method tree species of strong trunk, deep rooted and large crown are preferred which are raised around the agricultural land

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... cropping. Planting only one species every year may turn the soil infertile and ... to erosion. So, rotational cropping is necessary. In this system one crop is ... by next crop usually legume which makes the soil fertile.

... hilly areas, the farming should be done only when the land is terraced ... because without terracing the run-off is increased and soil is easily eroded.

... application of Geojute/Geotextile, **Mulching and Saw Dust**

...extile

... geotextile has advantages: enhance infiltration and improve drainage because it ... hydraulic conductivity, surface erosion control, slope stability and reinforcement ... of site conditions for vegetation establishment and growth. Geotextiles used for ... control can be classified by their:

... (natural or synthetic, which in turn affects their durability on site)
... location (surface or buried).

... made from natural often vegetative materials is biodegradable, so their durability is ... as they decompose the natural vegetation will establish and develop sufficiently to ... erosion. Jute, a commonly used raw material in surface is applied. Geotextiles will rot in ... year. Some artificial tests into Geotextiles durability reveal that fiber namely cotton, ... and coir are used in making of geotextile. Further, durability of coir-textile is 15 time ... cotton and 7 time longer that the jute.

...

... should be stabilized by the application of *mulches and amendments*. Before ... of any stabilizer, spoil pH should be corrected to around 6.0-7.5 by addition of lime ... Spoil surface can be covered with various organic mulches, e.g., straw, saw mill ... and cellulose mulches (bark, wood chips, wood fiber). Surface mulches are important ... usually improve conditions at the surface of the spoil. Mulching can help in ... plant growth by

- preventing erosion both due to water and wind,
- facilitating water infiltration,

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- improving soil moisture conditions by reducing evaporation,
- spoil temperature amelioration by its colour and insulating properties,
- being compatible with plant development, improve germination conditions and protecting seedlings.
- re-inoculating microorganisms into spoil, preventing of soil crust formation,
- helps soil structure formation and enhancing nutrient supply.

In addition it eliminates competition between undesirable weeds and native species. The effectiveness of different mulch materials in soil erosion and vegetation establishment will be dependent on: type of mulch material used; mulch morphology, application rate, method of application (surface versus incorporated); soil type; slope and climatic characteristics.

Sawdust

Sawdust can be used as organic mulch that is very effective at controlling weeds, insulating soil, and conserving soil water. Sawdust can also be used to improve soil quality, especially if it is combined with other organic materials as part of a composting program. Sawdust tends to be acidic and is best used on acid-loving plants i.e. stress tolerant native plants.

Fresh sawdust tends to form a crust that is impervious to rain water. This can be mitigated by frequently raking the sawdust to break up the crust (no fun) or by combining the sawdust with larger mulching materials such as bark or wood chips. It also helps to apply the sawdust mulch conservatively, generally in a layer no more than a couple inches thick.

Although some people do it, it is not recommended to incorporate sawdust directly into the soil because it has a high carbon-to-nitrogen ratio (300-500:1) and tends to rob soils of plant-available nitrogen. Instead, it is better to first compost the sawdust over time with materials high in nitrogen such as grass clippings and then add the "fully-cooked" compost to the soil. The composting also moderates the acid levels in the sawdust. When used as mulch on top of the soil, nitrogen depletion is less of an issue but be ready to apply the nitrogen fertilizer if your plants turn yellowish-green and grow slowly. Also keep the lime handy.

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कार्यालय : वन प्रमण्डल पदाधिकारी, धनबाद वन प्रमण्डल।

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सेवा मे,

महाप्रबंधक,
बस्ताकोला क्षेत्र,
बी0सी0सी0एल0।

विषय :– बी0सी0सी0एल0 के घनुआडीह एवं बेरा कोलियरी के थिरतारीकरण के क्रम में वृक्षों के पातन के संबंध में।

प्रसंग :– सदस्य सचिव, उच्च स्तरीय समिति–सह–वन प्रमण्डल पदाधिकारी, राँची वन प्रमण्डल, राँची का ज्ञापांक– TCF-03 दिनांक– 27.01.2023

महाशय,

उपर्युक्त विषयक प्रासंगिक पत्र के क्रम में सूचित करना है कि पूर्व में निर्गत इस कार्यालय का पत्रांक– 258 दिनांक– 30.01.2023 को संशोधित करते हुए वन क्षेत्र पदाधिकारी, शहरी वानिकी प्रक्षेत्र, धनबाद के जाँच प्रतिवेदन पत्रांक– 1258 दिनांक– 04.12.2022 एवं दिनांक– 27.01.2023 को वृक्ष पातन संबंधी उच्च स्तरीय समिति की बैठक में लिये गये निर्णय के आलोक में मेसर्स बी0सी0सी0एल0 की घनुआडीह एवं बेरा कोलियरी खुली खदान परियोजना में सन्निहित वन भूमि 234.08 हे0 पर अवस्थित कुल– 3768 वृक्षों के पातन की अनुमति निम्नलिखित शर्तों के आधार पर दी जाती है–

1. उपरोक्त वृक्षों के पातन से पूर्व वन क्षेत्र पदाधिकारी, शहरी वानिकी प्रक्षेत्र, धनबाद एवं प्रमण्डलीय प्रबंधक, लघु वन पदार्थ परियोजना प्रमण्डल, गिरिडीह को सूचित करते हुए वृक्षों का पातन करायेंगे।
2. वृक्षों के पातन से प्राप्त सभी टुकड़ों की विस्तृत गणना मापी सहित प्रतिवेदन प्रमण्डलीय कार्यालय में संबंधित वन क्षेत्र पदाधिकारी, शहरी वानिकी प्रक्षेत्र, धनबाद के माध्यम से समर्पित करेंगे।
3. पातित काष्ठों के परिवहन हेतु नियमानुसार परिवहन अनुज्ञा–पत्र वन क्षेत्र पदाधिकारी, शहरी वानिकी प्रक्षेत्र, धनबाद से प्राप्त होने के उपरान्त ही करेंगे।
4. यह सुनिश्चित करेंगे कि पातन के क्रम में किसी भी परिस्थिति में चिन्हित वृक्षों के अलावा किसी अन्य वृक्ष का पातन नहीं हो।
5. पातित वृक्षों के सभी टुकड़ों को Marketable Size में करवाये एवं टुकड़ा किये गये काष्ठों का परिवहन प्रमण्डलीय प्रबन्धक, लघु वन पदार्थ परियोजना प्रमण्डल, गिरिडीह से सम्पर्क स्थापित कर उनके निर्देशानुसार निर्धारित डिपो में करायेंगे।
6. 3768 वृक्षों की गणना सूची का संयुक्त जाँच प्रतिवेदन एवं उच्च स्तरीय समिति की प्रति इस पत्र के साथ संलग्न है।
7. उच्च स्तरीय समिति द्वारा लिये गये निर्णय के आलोक में पातित होने वाले 3768 वृक्षों के 10 गुणा अर्थात 37680 वृक्षों का रोपण लौह/बाँस गैबियन/Barbed Wire Fencing/Block Plantation Project स्थल के आस–पास प्राथमिकता के आधार पर करेंगे।

अनु0–यथोक्त।

विश्वासभाजन
ह0/–
वन प्रमण्डल पदाधिकारी,
धनबाद।

परियोजना पदाधिकारी
Project Officer
कुईयाँ कोलियरी

ज्ञापांक– २१५ दिनांक– ०५-०२-२०२३

प्रतिलिपि– प्रमण्डलीय प्रबंधक, लघु वन पदार्थ परियोजना, गिरिडीह को सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित।

4/2/23

वन प्रमण्डल पदाधिकारी,
धनवाद।
04.02.2023

परियोजना पदाधिकारी
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Annexure-

	Report on Drain/Jor/pond repairing and/or Cleaning	
Year	**Name of Work**	**Value**
2020-21	Cleaning and repairing of drain Murlinagar	2,04,556
	Cleaning ,collection and disposalof domestic waste, Drain garbage Bera colony	83,058
	Cleaning of drain and ash Kuya colliery	69,598.12
	Total	**3,57,212**
2021-22	NIL	
2022-23	Cleaning of Chatkari Jor Bera	46,628
	Cleaning of jal Kumbhi ROCP Chatkari Jor	1,31,423
	Cleaning of drain ROCP	1,05,738
	Cleeaning of pond near singh nagar	22,173
	Cleaning and repairing of drain in colony at Durga Mandir Kuya	1,61,869
	Total	**4,67,831**
2023-24	Cleaning repairing drain Victory colliery	1,66,985
	Cleaning repairing drain matkuria	1,16,764
	Cleaning of Tisra Jor Kuya	1,54,283
	Cleaning of drain no 2 Bastacolla colliery	1,61,772
	Repairing and cleanng of drain bera modal colony	1,79,645
	Cleaning of pond Singhnagar	20,589
	Repairing and cleanng of drain MOCP	2,18,038
	Cleaning of drain no 01 at bastacolla colliery	1,61,209
	TOTAL	**11,79,285**
2024-25	Cleaning of tisra jore at kuya	2,17,702
	TOTAL	**2,17,702**
GRAND TOTAL		**22,22,030**

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Annexure: Photographs

1. Photographs of Demarcation of boundary of Safety Zone with barbed wire and RCC Pillars

2. Photograph of retention/toe walls and check dams

Retention/ Toe wall around OB dump of Bera Colliery

Check dam over Chatkari Jore near Govardhan Eco-park

3. Photographs of Top soil management

4. Photographs of Afforestation

Plantation site at Dobari Colliery

Plantation site at Bera Colliery

Plantation site at Kuya Colliery

Plantation site at Kuya Colliery

5. Photographs of Grassing

Seed ball broadcasting at OB dump of Bera Colliery

Seed ball broadcasted at OB dump of Bera Colliery

Grassing at OB dump of Kuya Colliery

Grassing at OB dump of Bera Colliery

6. Photographs of Avenue Plantation

Avenue plantation along transportation route to BNR Railway siding

Avenue Plantation outside leasehold area

7. Photographs of Sedimentation Pond

A. Sedimentation Pond at Bastacolla Colliery	**B. Sedimentation Pond at Kuya Colliery**
	
C. Sedimentation Pond at Victory incline, Bastacolla Colliery	**D. Sedimentation Pond at Bera colliery**