IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

PRE-FEASIBILTY STUDY FOR STONE MINING PROJECT

Kamini Mishra[1] and Sadhana Chaurasia[2]

[1,2]Dept. of Energy and Environment, M.G.C.G.V, Chitrakoot, Satna (M.P.)

485334

ABSTRACT

Pre – feasibility study act as one of the first exploration of a potential investment. Companies use these studies to collect information before investing millions of dolor in to task like squaring permits or equipment. Pre-feasibility study take in to account factors that may impact or interfere with the final project that can involve community issues, geographic obstacles permit challenge and more. It includes detail design and description for the mining operation as well as cost estimates, project risk, safety issues and other important information. This study intended to evaluate in mineral reserve can be mined effectively and if it will be profitable. Detailed mining feasibility studies are also used as the basis for projects capital estimates, operating cost an overall economic viability. Prefeasibility study can provide useful update on the progress of project. This study help create a more concrete picture about project milestone and challenges moving forward.

Stone mining have been recognized as a potential future stone sources for over 10 years. A high quality stone belt is spread around 100 km area from west to east. A large number of people are dependent on stone mining activities for carrying their livelihoods as stone mining is one of the most economic activities after agriculture practice.

Key Words: Pre-feasibility study, Stone mining: development, mining project, Environmental impacts, biodiversity.

INTRODUCTION

Pre – feasibility study is an early analysis of a potential mining project. It gives an overview of mining project logistics, capital requirements, and other information important to the decision making process (Jain & Watve, 2019). This study act as one of the first exportation of potential investment.

Pre-feasibility studies are increasing worldwide due to the trend in research and development that various companies, institutions, and government agencies in many countries are conducting as they generate new strategies and technologies for competitive growth (Ruffies et.al. 2012).

A pre-feasibility report is a clear and detailed report that outlines the preliminary evaluation or initial assessment conducted on a proposed project to determine if the research and development activities and tasks meet the application requirement in the first stage. Project managers, consultants, supervisors, and evaluators undertake a pre-feasibility study to review the major aspects of the proposed project and select the best option to address a specific issue. They prepare a Product Feasibility Report on the preliminary project analysis to demonstrate its advantages and viability and guide them in a proper and reasonable decision-making process on whether to proceed with the proposed project plan or no (Rathoure,2021). The Pre-Feasibility Report is sometimes called an Initial Screening Report (ISR).

Basic Elements of Pre-Feasibility Report –

Conducting pre-feasibility studies is a vital method involved in the business and strategic planning processes of many companies and organizations. Project managers, product designers, and system developers examine the viability, of the proposed project by observing various options to narrow down potential ideas (Brent & Petrick 2012).

Basic Information/Introduction: Indicate the name of the department or team assigned to work on the proposed project. Write the title and acronym of the project. Describe the departmental and agency priority. Add the approval signatures of the executive project management approval team.

Project Summary: Create a clear and engaging executive summary of the proposed project as you describe the purpose, goals, objectives, and vision. Include the contact information of the project manager and other key professionals of the project. Explain the relevance of the project to the state and departmental plans. Construct a simple project schedule and budget information to execute the project plan. Also, include the project budget information of the vendor, details of the quality risk assessment, and the project profile.

Business Case Information: Describe the background of the business or program. Specify the problem or opportunity of the proposed project as you identify the main objectives and functional requirements.

Baseline Analysis: Clarify the existing method used while performing a pre-feasibility study. Explain the technical environment that exists and the current infrastructure.

Proposed Solution: Add a clear description of the solution for the issues that the proposed project will resolve. Create a rationale for the initial assessment and selection process. Elaborate on other alternatives that are considered.

. This document provides basic information on the key components of a proposed project which includes economic, environmental, financial, and legal considerations, and a comprehensive analysis and evaluation of the merits and viability of the proposed project.

Stone Mining: Mining has been practicing everywhere in the world's from time immemorial. It is a major economic activity in developing countries. The areas where mineral and power resources are found abundantly, mining activities have largely been carried out. This has led to high economic growth in area through increase in per capita income and thus increase in regional and national income (Shah 2019). Meanwhile, along with economic growth, mining activities raised concern on environmental conservation. Large-scale degradation of environment due to mining activities put many questions forward on whether or not the mining activities should be continued. Operations, whether small or large-scale, are inherently disruptive to the environment, producing enormous quantities of waste that can have deleterious impacts for decades. The environmental deterioration caused by mining occurs mainly as a result of inappropriate and wasteful working practices and rehabilitation measures (Anshu 2019).

There is a progressive increase in average size of mine due to adoption of heavy earth moving machinery with increased production of overburden thus aggravating the existing environmental challenges. Opencast mining operation result in dumping of huge volume of overburden on unminds land in addition to pit – scarred landscape. This overburden originates from the consolidated and unconsolidated materials overlying the minerals and coal seams, and is required to be removed. One of the major environmental challenges is to manage the huge volume of overburden generated in these opencast mines which is associated with the problems of aesthetics, visual impacts and landslides, loss of top soil, soil erosion, safety, risk and health etc. (Chawdhary 2014) In addition, open cast mines makes a marked change in the land use and the challenge lies in developing suitable post – mining land. This paper examines the feasibility study of stone mining and suggests appropriate measure for environmental conservation.

METHODOLOGY

In order to ensure that the contents of pre-feasibility reports are comprehensive enough and provide necessary information required for scoping the project, following guidelines are provided. The pre-feasibility report should invariably provide a broad outline of the following aspects; the pre-feasibility report should be brief, the minimum information required for scoping and prescribing TORs should be made available there in. CPCB guideline (2006) were followed for collecting all the information

Requirement for PFR- Background information, Project Description, Site Analysis, Planning Brief, Proposed Infrastructure, Rehabilitation and Resettlement Plan, Project Schedule & Cost Estimates, Analysis of proposal (Final Recommendation)

RESULT & DISCUSSION

Brief description of nature of the project:

Mining of stone is proposed in the lease area of 1.998 hectares at Village - Rojana, Tehsil – Jaora, District – Ratlam (MP). Quarry Lease area is a non – forest Private land and lease has been granted for the period is for 10 years. Mining will be carried out by Semi-mechanized opencast method.

The total mineable reserve of stone estimated to be 1, 37,750 m3 and maximum annual production Capacity is 7,600 m3/year Stone. Geological Reserve of the area is 2, 99,700Cu.mt. and the total mineable reserve of stone available estimated to be1, 37,750 Cu.mt. Proposed production of Stone estimated to be 7,600 Cu.mt/year. As per The Gazette of India, Department of MoEF & CC dated 15/01/2016 and SEIAA O.M. No. 12576, Date 24/03/2016the project falls under B1 Category and Environmental Clearance is required from SEIAA.

Need for the project and its importance to the country and or region:

The basic objective of the project is to effective utilization of material in the region. Crushed stone is one of the most accessible natural resources, and is a major basic raw material used in construction, agriculture, and other industries (Sati 2014) and will be sold to nearby markets to cater the demand of local population. The proposed Stone Quarry will also marginally benefit the local people by way of direct and indirect employment. State Government will also be benefitted by the mining through royalty.

Demand – Supply gap:

Considering sufficient availability of the mineral in the area, it is essential to have Stone mine to sustain the supply of mineral for various purposes verses demand. The Stone is partly used in road filling and foundation. Therefore, partial demand of the required material used in such industries can be accomplished from this mine.

PROJECT DESCRIPTION

The mining of stone is carried out by open-cast Semi-mechanized method with controlled drilling and blasting using sand bags (Hong et.al. 2021). The extracted stone boulder will be resized and transported to crusher unit for further crushing for resizing the stone. This is an independent project and not proposed to be linked to any other project.

Satellite Image of the mining area:

Location map showing project boundary and surrounding land use is given below:

Fig.-1 Satellite image

Mining process

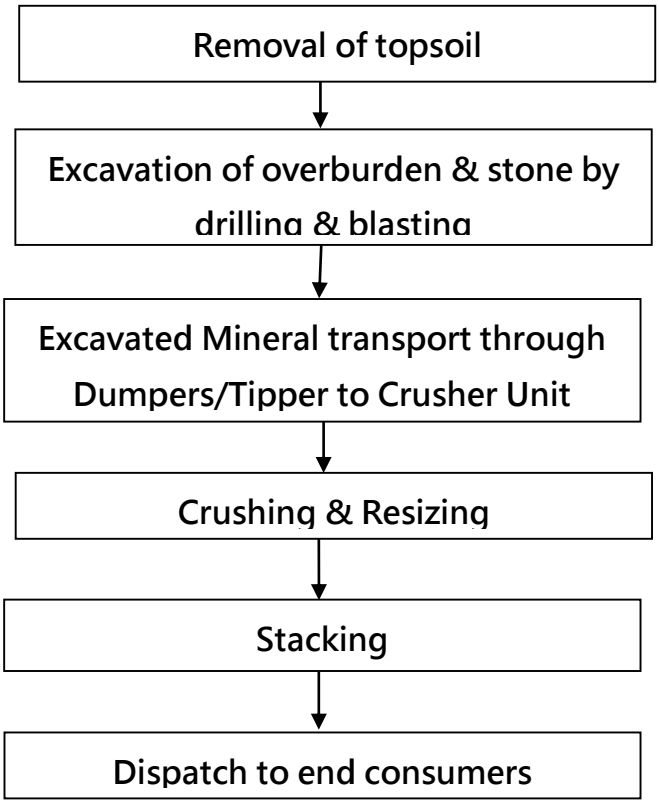

Fig-2.Process flow chart of mining

Mining Method & required Machineries -Mining/excavation will be undertaken according to the proposed Manual & Semi Mechanized methods. Equipment & Machineries like Wagon Drill, Hydraulic Excavator, Loader, Jack Hammer, Rock Breaker, Water Tank, Dumpers and Tractors etc. will be required to deploy on hire & owned basis for mining works.

Wastes generated and their management/disposal

Overburden- During the proposal period approx. 1,600m^3overburden generated which will be used for making ramp, repairing and maintenance of road in every few months and rest will be used for back filling.

Waste- During the proposal mining about 2000 m^3 mine waste (5 %) is likely to be generated in 5 year period will be used for the repairing of the approach road at regular basis.

SITE ANALYSIS

Connectivity: The proposed mine area is connected by road to the nearest village Rojana, located about 1.8 km South-East. The districts headquarter Ratlam city is about 39.91km North-West from this village and is well connected by road. The nearest Railway Station Jaora Railway Station located about 6.8Km South-West from mine site. Indore is the closest airport located about 126 km West from mine site.

Land use & land ownership: The lease area is plain undulated barren/waste land. The proposed mine area is private land.

Topography: The topography of the land of QL. is almost plain land, with slope towards the East side of the area. The average elevation is 496m above MSL. The quarry lease area is a barren non forest land of Madhya Pradesh Private land covered with mainly Basalt rock. Topographically the lease area is

andulatory. The drainage is controlled by small gullies are joining the seasonal nallas. The drainage pattern is dendritic.

Social Infrastructure: The nearest village is Rojana, where primary health & educational facilities (in the form of primary and secondary schools) are available. The infrastructure like site office, temporary rest shelters with first aid facility and toilets already at mine site for mine workers for entire duration of mining. Post office and telephones services are accessible via nearby villages. Most of the villagers have mobile phones.

Planning Brief

Planning Concept: The quarry lease for crusher stone will be developed by opencast Semi-mechanized method by forming benches. Stone production of 7,600cubic meter/year has been estimated from the mining area.

Population Projection: Man power requirement for mining is estimated to be ~ 15 Nos. Most of the employees will be recruited from neighboring villages depending upon the availability of skilled & unskilled people. No significant influx of people is anticipated in the area.

Land use Planning: The proposed mine area currently is an undeveloped undulated land. The land use of the proposed area will change once mining is over with the creation of mined out pit and dumping site. The mined out pit will be utilized as water reservoir and would act as recharge structure for the local aquifer. By the end of project completion, plantation will be grown on dumping site and around quarry land area and will form the green belt.

Assessment of infrastructure demand (physical and social): The existing road network will be sufficient to meet the proposed production capacity. However, required infrastructure for transport within the leasehold area will be further strengthened and improved as needed. No new routes or alternations are required.

ANALYSIS OF PROPOSAL

Project will create direct & indirect employment opportunities within the surrounding region. Mining proponent would employ local people from the nearby villages depending upon the availability of skilled & un-skilled man power surrounding the project site. Creation of water reservoir from open mined pit would assist in recharging the local aquifer system and may enhance irrigation capacity in the neighborhood. Distribution of plants among the local villagers to plan to plant more and more tree species so raising the aesthetic beauty of the area.

Impacts of Stone mining –

Visual impact: Visual impacts include aesthetic & scenic and landscape aspects. Visual and land use compatibility of rehabilitated mined land is the single most important consideration in designing a combination of landforms and revegetation processes. While there can be occasions where a change to a completely different land use is beneficial. The significance of the visual impacts depends on the distance, weather conditions and the height.

Impacts on water quality

Surface Water: The mobility of the pollutants from these sources is magnified by exposure to rainfall and snowfall. Impacts to surface waters include the build-up of sediments that may be contaminated with heavy metals or other toxic products, short and long-term reductions in pH levels (particularly for lakes and reservoirs), destruction or degradation of aquatic habitat, and contamination of drinking water supplies and other human health issues.

Ground Water: Ground water quality is also affected when waters (natural or process waters or wastewater) infiltrate through surface materials (including overlying overburden waste or other material) into ground water (Thakur, 2013). Contamination can also occur when there is a hydraulic connection between surface and ground water.

Noise pollution: The heavy earth moving machinery operations in the overburden handling leads to an increase in the noise levels in the nearby residential areas also. During the operation stage the noise level in the overburden dump sites can be minimized by Minimize the haul road gradient in the dump as far as possible and reduce the overburden material falling during the dumping operation.

Ecological disruption/ impact: Sediments deposited in layers in flood plains or terrestrial ecosystems can produce many impacts associated with surface waters, ground water, and terrestrial ecosystems. Minerals associated with deposited sediments may depress the pH of surface runoff thereby mobilizing heavy metals that can infiltrate into the surrounding subsoil or can be carried away to nearby surface waters. Contaminated sediments may also lower the pH of soils to the extent that vegetation and suitable habitat are lost. This study was aimed to prepare feasibility report for stone mining.

Conclusion-

The base line studies relents hazardous levels of dust and noise and prevailing at the project area. The small quantity of humus rich surface soil should be removed and preserved in the boundary barrier to facilitate the afforestation. Environmental care and attitude of preventing environment should be inducted to mitigate the impacts due to quarrying. Project will create direct & indirect employment opportunities within the surrounding region. The project will benefit marginally to the state revenue through royalty on the mineral and other taxes. Small and medium scale industries may be further development as a consequence.

From the assessment of proposed Stone Quarrying project, there shall have adverse impacts on the surrounding environment. A well implemented environmental management plan will help in mitigation and the adverse impacts due to quarrying activities.

Recommendations-

The mined out area should be developed into a water body and thick plantation, which will be helpful for improving the aesthetics of the area and also in improving the ground water recharge in the area.

Improvement in irrigation capacity in the form of mined out pit acting as a recharge structure for the local aquifer system and enhancing the aesthetic beauty of the area by greenbelt development etc.

REFRENCES

Anshu (2019) Review paper on data mining techniques and applications: **International Journal of Innovative research in computer science & technology,** 7(2):22-26.

Brent, A. C. & Petrick W. (2012) Environmental impact assessment during project execution phases: towards a stage – gate project management model for the raw materials processing industry of the energy sector**. Impact Assessment and Project Appraisal,** 25(2):111-122.

Chowdhury N. (2014) Environmental impact assessment in India: Reviewing two decades of Jurisprudence; Environmental Impact Assessment in India; **IUCN E Law Journal**: 28-32.

Hong S., Kim H.-W., Yeu T.-K., Arai R., & Yamazaki T. (2021), Preliminary economic feasibility study of ferromanganese nodule mining by mechanical lifting and small-scale collectors**; Minerals**, 11:1389

Jain N. & Watve A. (2019) Contestation of environmental impact assessment for greenfield airport, Mopa, India through the lens of vulnerability; **Indian Journal of Environmental Sciences**, 24(01): 1-15.

MoEFCC (2006) Notification

Rathoure A. K.(2021), Environment impact assessment (EIA) studies for development activities in India in context with EIA 2020; **Octa Journal of Environmental Research,** 9(1): 21-45.

Ruffeis D., Loiskandl W., Awulachew S. B., & Boelee E. (2012) Evaluation of the environmental policy and impact assessment process in Ethiopia; **Impact Assessment and Project Appraisal,** 28(1): 29-40.

Sati V. P. (2014) Socio-economic and environmental impact of stone mining in shivpuri district, Madhya Pradesh, India; **Journal of Scientific Research & Reports,** 4(01): 47-54.

Shah S. G., (2019) An analysis of EIA report of the second international airport project, Nepal; **Hydro Nepal: Journal of Water, Energy and Environment,** (24): 57-67.