

# Environmental Audit: A Need for Sustainable Development of Mining Industry

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## ABSTRACT

The last decade of the 20<sup>th</sup> century has been regarded as the decade of the environment. Environmental auditing is fast emerging as a key practice among industries in India. An environmental audit is one tool that can be used by an organization, in the context of its environmental management system, to help determine its environmental performance. The concept of environmental auditing is promoting the use of clean technologies in industrial production to minimize generation of waste. An attempt has been made to understand and classify the environmental audit in Indian mining industry, and the role of Supreme Audit Institution (SAI) in Indian mining industry.

## Keywords

Environmental audit, Sustainable development, SAI, CSR, accountability.

## 1. INTRODUCTION

The mining sector is likely to contribute to the development of the economy of any country through taxes from large-scale mining companies, and contribute to social-economic infrastructural development within the area where the mine is located. Legislation for mining may require an environmental impact assessment to be carried out before a mine is developed, and that a mine be developed and operated in an environmentally sound manner with the least impact on the environment. Environmental aspects of mining despite the economic importance of the mining industry, there are serious environmental effects associated with it. The effects start at the exploration stage, extend through the extraction and processing of minerals, and continue after the mine has closed. The type and extent of the effects can vary from one stage to another. But at the same time, sustainable development of mining industry is a concept that attempts to shape the interaction between environment and society, so that advances in wellbeing are not accompanied by deterioration of the ecological and social system which supports life into the future.

Accounting for sustainability, Corporate Social Responsibility (CSR) is characterized by some of the scholars as a 'technology of modernity' (Gray, 2010); where auditors employ largely checklist methods to create CSR accounts that justify corporate actions. Aspects of accountability for CSR in mining by challenging the current 'Audit culture', offer a tool through which to shape and regulate corporate Social Performance (CSP) (Zadek et al, 2004; Kemp et al, 2012). Supreme Audit Institutions (SAIs) can undertake audits to check that the mining industry is complying with requirements of this kind. A SAI can therefore play a major

role in auditing a government's commitment to protecting the environment from the negative impacts of mining.

In the present paper, an attempt has been made to understand the environmental threats to the surrounding region due to mining activities. Also the main focus of the article is the know about the concept of Environmental Audit in mining sector, its functioning, steps, characteristics and role of SAIs in India mining sector.

## 2. ENVIRONMENTAL ASPECTS OF MINING SECTOR

Mining is the industry which always works against the natural ecology; its negative impacts start with exploration, extend through the extraction and processing of minerals, and can continue after the mine closes. The nature and extent of effects can vary throughout the stages of project implementation. Both large and small-scale mining operations have an impact on the environment. Mineral resource activities affect all environmental media – land, air, water, and associated flora and fauna – as well as the human environment – individual health and safety, local community lifestyles, cultural survival, social order and economic well-being. Although the majority of the impacts of mining are said to be "localized", mining can cause national, trans-boundary and global environmental problems. Environmental hazards and impacts also threaten indigenous cultures and native community land use, and socio-economic and cultural practices in countries with resource-based economies. These disruptions include permanent loss of natural resources, preemption of alternative land uses (for agriculture, forestry, hunting or leisure), ecosystem degradation and loss, destruction of key flora and fauna, displacement of populations, settlement influxes, crime and diversion of individuals and communities from traditional practices to boom-bust employment and small-scale or artisanal mining dependence.

## 3. CORPORATE SOCIAL RESPONSIBILITY AND ITS ACCOUNTABILITY

Over the past two decades the global mining industry has witnessed the necessity and emergence of community relations and development (CRD) functions, essentially under the rubric of sustainable development and corporate social responsibility (CSR). These functions provide companies with mechanisms through which to engage and manage their relationships with key stakeholder groups, share development benefits and protect business interests. Mining and mineral processing are activities for

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extraction and processing minerals for commercial use. The mining sector can:

- create employment opportunities both directly in the mines and indirectly on services to the mines,
- provide education and health services,
- increase foreign exchange reserves (reducing a country's foreign exchange deficit),
- improve infrastructure like roads and water supply, and
- Create other economic activities to support the mines Instead of importing all supplies from abroad.

As part of these more instrumentalist processes, operational-level personnel tend to become subjects of rather than participants in deliberations about the challenges of CSR and the possibilities for improved social performance in their particular context. As a result, inherent organizational knowledge of CSR is constrained by the audit process and the opportunity for critical reflection stifled, effectively limiting 'operationalization' of CSR on the ground (Hilson, 2003).

Now a days to shape and regulate corporate social performance (CSP), auditing is a popular tool. Where audits have limited value is in their ability to stimulate internal engagement around social and organizational norms and principles, as the process relies on auditors to generate performance data against pre-selected indicators. Data is then utilized to produce a measure of risk or effectiveness through which to demonstrate compliance. Focusing on the internal organizational aspects of accountability and the processes, mechanisms and methodologies used to establish critical reflection, three alternatives within the current audit regime are presented. These forms of 'new accounting' stand in contrast to conventional auditing, as their focus is on building cross functional connections and collaborative internal relationships that are based on dialogue and mutual exchange about the problems and possibilities of CSR implementation. Internal accountability for corporate social responsibility (CSR) can better manage social performance in the mining industry. With its emphasis on rational analytics, audit culture sits in contrast to the increasing emphasis being placed on accountability's more relational and interactional aspects (Newman, 2004; Kemp and Owen, 2013).

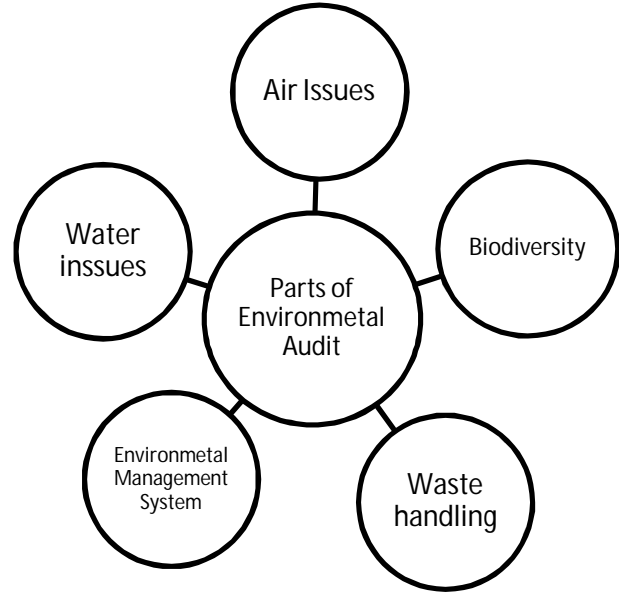
### 4. ENVIRONMENTAL AUDITING

An environmental audit is a systematic, documented, periodic and objective evaluation of how well environmental regulatory requirements and commitments are met. Environmental audit is one tool that can be used by an organization, in the context of its environmental management system, to help determine its environmental performance. Various parameters used in environmental audit are shown in figure 1.

The challenge to the auditor normally is selecting and determining the scope of the audit. This was the reason for designing a guide that will help SAIs and auditors when they choose and design audits on environmental impacts of mining. The guide presents various ways of describing the scope, from ownership and access rights for exploratory purposes through mining and processing, use of the end product and disposal of waste materials. Additionally, the guide presents the responses of governments, such as laws regulating mining and mineral activities, conventions, protocols, declarations, treaties, standards, codes and recommendations related to mining and the environment.

During the planning stage, the environmental problem(s) and responses in mitigating the negative consequences are identified.

Further, auditors need to prioritize and limit the audit area. The audit criteria are normally drawn from international conventions, legislation, policies, and programs. Case studies of audits on mining activities For each topic, auditors will develop audit criteria using experiences from similar audits conducted in other countries (Chikkatur et al, 2009).



**Figure 1. Various parameters of environmental audit in Mining sector**

Selecting and determining the scope of audits of mining is a big challenge for SAIs. Audits for mining means focusing not only on the traditional economic concerns, but also on new social, economic and environmental concerns, particularly in developing countries like India with resources based economics. This includes a wide range of conventions, protocols, declarations, treaties, standards, codes and recommendations relating to environmental, social and economic norms. The broad designed steps for audits in mining industry are shown in figure 2. These steps should be used to define the objectives, scope, and criteria of a single audit on minerals and mining. During the planning stage auditors are advised to understand the environmental problem and governmental responses in mitigating the negative consequences in the respective country.

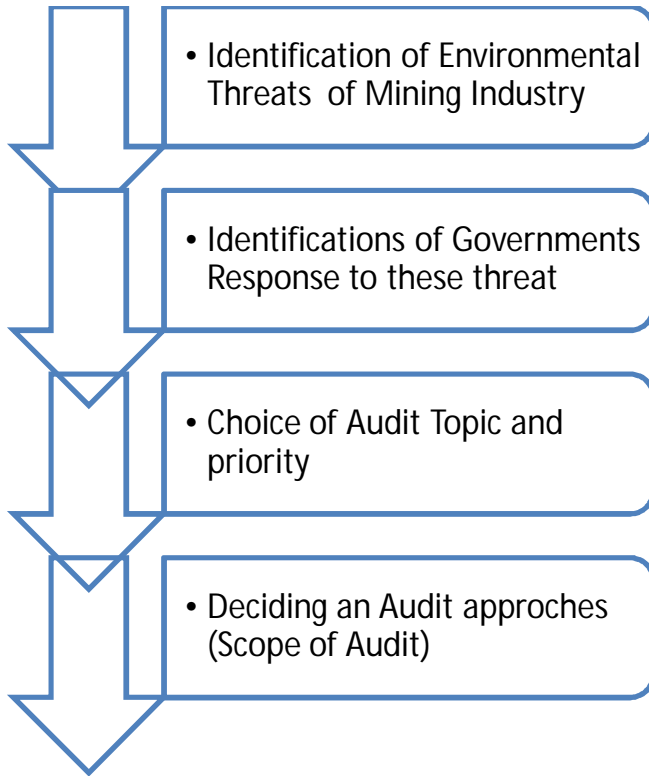


Figure 2. Steps in environmental Audit

#### 4.1 Levels of Auditing

A different level of audit may be chosen based upon why the audit is being conducted. Three broad level of audit can be identified:

##### 4.1.1 Self-Auditing/Self-assessment

Team members are selected from the staff of the business, operating unit or department to be audited.

##### 4.1.2 Internal Audit

Team members are selected from employees of the organization, but not from the business, operating unit or department to be audited. In some circumstances it may, however, be of benefit to have a representative of the unit on the audit team. They should not be team leaders

##### 4.1.3 External Audit

Team members are drawn from outside the organization for example, consultants. The team may, however, be assisted by employees of the organization such as a business, operating unit or departmental manager acting as a guide and advisor. This type of audit may be useful where third party benchmarking, certification and neutrality is required, or where company resources do not allow internal audit.

Audit practices can be differentiate based on the level of auditing, but the activities and guidelines are same at any level. Audit team should plan properly before reaching to the site. Audit team should collect the maximum fruitful information form the site. At last after auditing team have to compile the final report. Activities in auditing process are shown in figure 3.



Figure 3. Activities in Audit Process

#### 4.2 TYPES OF AUDITS

##### 4.2.1 Financial Audit

Includes Cost from Environmental Policies and obligations- Pollution, abatement cost, cost of decontamination of land, cost of decontamination of water etc. Financial audit has to probe Environmental issues and ensure correctness of Environmental cost, Liabilities, Assets. This type of audit ensures disclosure of Environment liabilities, non-compliance of obligations and penalty etc. Cost incurred for making environmentally clean atmosphere before commencing the operations- upfront cost, such cost if incurred would be treated as environmental cost to commence the business. Decontamination of the land for a new business, cleaning of plants and machinery etc are upfront costs to be considered for making the venture environmentally clean before the business is handed over to others is backend cost.

Environmental liabilities include the liabilities arising out of fees and penalties levied by regulators, other liabilities as result of non-conforming of rules and regulations imposed by the Govt/regulators etc. Liabilities for rehabilitation of displaced persons form a project site and liabilities for cleaning of environment for fresh air, fresh water and land etc.

##### 4.2.2 Compliance Audit

Compliance audit leads the concept of environment protect to sustainable development. Frame work of compliance audit came in shape after several meets including United Nations Conference on the Human Environment (Stockholm) in 1972, Report of the World Commission on Environment and Development (Brundtland) in 1987, United Nations Conference on Environment and Development Rio Declaration in 1992, Guiding Principles on Forest and World Summit on Sustainable Development (WSSD) in 2002.

Audit of Compliance includes:

- International Environmental Treaties are ratified by individual Countries.
- Individual Legislation for Environmental issues in alignment with Treaties
- SAI audits the legislation for compliance
- Governments frame Environmental Programmes for Environmental issues

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### Audit of Legislation

- SAI to compare the provisions of legislation with reference to provisions in the treaties
- Inadequacy to be brought out

Environmental Programmes to be audited for: sufficiency of fulfillment of target, sufficiency of fund allocation, sufficiency of meeting the International Accords

### 4.2.3 Performance Audit

Conventionally in mining industry 3 Ees concept – Economy, Efficiency and Effectiveness is used since many decades. Environmental Auditing is the 4<sup>th</sup> E. 2 more EEs are the specialty of performance audit—Ethics, Equity. These 2 Es focuses on compliance of Environmental laws, performance Audit of Environmental programmes, Environmental impact of normal programmes of Government, Environmental Management Systems, Evaluation of proposed Environmental policies, Environmental issues being implemented by Governmental agencies, NGOs etc and audit of Regularity, bodies to ascertain their roles in pollution control, abatement etc.

Statistical sampling techniques to be used for audit of environmental issues concerning hundreds or thousands entities. In case of data regarding compliance available at scattered places, audit to concentrate on data base created by Regulatory bodies. In case of absence of centralized data, Regulatory bodies to compile and submit as they have direct access to the data in Non-Governmental sources. Absence of reliable data in Regulatory bodies leads to form audit comments. SAI to rely on available data and give comments if found any insufficiency. Yet with the limited data, form opinion and report so that audited entity can act upon for control or abatement of Environmental Issues. SAI should compare obligations under International treaty and the sufficiency of Governmental Programmes to address them. SAI should audit and review the targets set vis-à-vis achievement. SAI also report the shortfall to highlight environmental threat to the country or mankind.

### 4.2.4 Assessment of Environmental Impacts

Assessment of environmental impacts involves complex calculations requires the involvement of experts. SAI adopt the figures and procedures designed by experts for reporting SAI to assess the competence of experts for assessment of impact.

## 5. ROLE OF SAIs IN AUDITING IN MINING SECTOR

SAIs has a role to play regarding mining activities in their country. Among the roles SAIs can play is to facilitate the transparency of government operations and ensuring that an informed public guides the actions of governments in the mining sector. SAIs can promote sound financial management and public accountability – both of which are essential elements of sustainable development. Moreover, SAIs' independence in carrying out financial, compliance, and performance or value-for-money audits puts them in a unique position to legitimately and credibly evaluate the effectiveness and efficiency of government policy and obligations, and to report on any unsustainable mining practices.

Additionally, the outcomes of an audit on mining will result in improved institutional and stakeholder capacity in the mining sector in the country. Through the recommendations in environmental audit reports, the government (through its ministries, agencies or authorities dealing with mining) will want

to ensure that mining companies take an environmentally and socially responsible approach.

In mining activities, there are six possible areas of focus in which laws, regulations, and direct agreements with the mining companies, as well as proactive policy interventions, can be designed. The six areas are land and water use; waste management; chemicals and pollutants; tailings disposal; human health risks; and potential environmental risks and the plans to mitigate these risks. It is important to note that adequacy of environmental and social safeguards have to be ensured at all stages of a mining operation, ranging from exploration, construction, operation, to the closure of the mine operation. The nature of mining activities affects the whole environmental media, be it water, land, forest, fisheries etc. author advice auditors who are conducting a mining audit to consider other relevant guidance to ensure that the mining audit is adequate and comprehensive. The following are some of the areas that may be relevant to an audit on mining:

- *Auditing Biodiversity*: – loss of biodiversity due to mining activities
- *Auditing Government Response to Climate Change*, – emission of green house gases due to mining processes
- *Auditing Forests: Guidance for Supreme Audit Institutions* – forest degradation due to mining
- *Towards Auditing Waste Management* – generation and disposal of waste from mining operations

## 6. CONCLUSION

The mining and minerals sector is central to modern life in any country. Literally millions of products are constructed using a range of more than 90 mined substances from around the globe. During the planning stage, the environmental problem(s) and responses in mitigating the negative consequences are identified. Further, auditors need to prioritize and limit the audit area. This paper provides an introduction to the environmental audit associated with mining activities, the relevant context where a SAI might be involved in auditing mining projects, and discusses the extent to which environmental issues should be addressed by private or public sector developers. The article also briefly mentions certain associated social impacts and issues.

The audit criteria are normally drawn from international conventions, legislation, policies, and programs. The main objective of having audit cases on mining and mineral processing is to assist SAIs to make informed planning decisions on the envisaged audits by learning from the experience of other SAIs.

Environmental audit increase management and employee awareness of environmental issues, more efficient resources use and financial savings and promotes 'Good Practices'. Providing better private and Public image and Security to top management.

## REFERENCES

- [1] Chikkatur, A. P., Sagar A.D. and Sankar T. L. 2009. Sustainable development of the Indian coal sector, *Energy* 34. 942–953.
- [2] Gray, R. 2010. Is accounting for sustainability actually accounting for sustainability. And how would we know? An exploration of narratives of organisations and the planet. *Accounting, Organizations and Society* 35 (1), 47-62.

- [3] Hilson, G. 2003. Defining “cleaner production” and “pollution prevention” in the mining context. *Minerals Engineering* 16, 305–321.
- [4] Kemp, D., Owen J. R. 2013. Community relations and mining: Core to business but not “core business”. *Resources Policy*, 38, 523–531.
- [5] Kemp, D., Owen J. R. and van deGraff S. 2012. Corporate social responsibility, mining and “audit culture”. *Journal of Cleaner Production* 24,1-10.
- [6] Newman, J., 2004. Constructing accountability: network governance and managerial agency. *Public Policy and Administration* 19 (4), 17-33.
- [7] Zadek, S., Raynard, P., Foster, M., Oelschlaegel, J. 2004. The future of sustainability assurance. *In: Account Ability*, the Council of the Association of Chartered Certified Accountants [ACCA] Working with Account Ability London