



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

# IJRSET

International Journal of Innovative Research in  
**SCIENCE | ENGINEERING | TECHNOLOGY**

# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 7, July 2023

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

Impact Factor: 8.423

 9940 572 462

 6381 907 438

 [ijrset@gmail.com](mailto:ijrset@gmail.com)

 [www.ijrset.com](http://www.ijrset.com)

# Sustainable Development Goals (SDG) of Mineral Industry: Need for Sustainable Mining Education

Er S.C. Agarwal

B.SC. ( Min. Engg ) , FCC (Coal & Metal), FIE, MMGI , MEAI, Recipient of National Mineral Award -03 GOI,  
Former President, ASI Industries( K) Ltd, Kota, Rajasthan, India

**ABSTRACT:** Going forward, mining companies need to challenge the minimum requirements for different roles and look out side their traditional talent pool if they want to find the best people. After all, mining is very teachable industry. Some one has further advocated that every educational institution must have compulsory course in ecology and wildlife to familiarise next generation with these topics. It is more relevant to engineering faculty. Most companies don't have value teams in areas such as environmental responsibility in quite the same way as yet. Like Safety Officer , Mining Companies need to appoint Environment Officers to take care of Environmental Responsibilities.

**KEYWORDS:** SDG, Sustainability, Mining, Education

## I. INTRODUCTION

In 500bc, chinese tao patriarch kuan tzu said: if you are thinking a year ahead, sow a seed. If you are thinking 10 yrs ahead, plant a tree. If you are thinking 100 yrs ahead, educate the people. If we are feeling concern of environmental and social issues more people need to be educated about social, environmental issues, climate change and global warming. Gone are the days when mine workers took a job and stayed, in same or less the same position , for 30 years or more.

Mr George Schaller, one of the first wild life scientist to study and discover several rare and charismatic species of wild life once remarked, on absence of environmental education in India, " I have been lucky to find something on environment in any major and well- respected Indian English daily. Advocating environmental education he suggested that "Editors of all media organisation across platforms need to be educated about green issues."It is paper media who can create public awareness and understanding on any issue including environment lively.

## II. ROLE OF ENGINEERS IN GENERAL

Engineers help create solution space-- suits possibilities that offer new choices, convenience, and comforts- that redefine our standard of living. Engineers are engaged in a profession with profound consequences. They are prospector of new opportunities, propellers of economics, designers of our mutual destinies,silent voices in every conversation and subliminal brokers who facilitate our experiences with the world.

Therein lies a paradox: engineering is omnipresent but invisible. It tends to be discussed only when there is disaster, roof caves in, or dump slope fails, an airplane crashes, a bridge buckles, a building crumbles, or a technology fails. They convert feelings into a products. At times thinking like engineers could be a liability.

All engineers needed to be environmentally educated so that they understand the issues involved in sustainable development and cleaner production. Engineering has responded to the need of society and without a doubt, today's society requires a new kind of engineers.

Next industrial Revolution for sustainable development need sustainable engineering education.

### III. MINING: ROLE IN SOCIAL DEVELOPMENT AND IMPACT ON ENVIRONMENT

Mining is the extraction of valuable minerals from earth's crust by man to satisfy his basic needs, such as housing, heat, light, food, in modern society including mobility and communication. Mining is part of primary production. The mining makes our daily life possible. It's rightly said Mining for the People. To differentiate themselves in socially and environmentally focused future, mining companies need Rightful and Skilled People and Mining Engineers to take challenges.

It is hard and true fact that life can't be visualised without mining. The main principle is that minerals are excavated for social consumption to improve social well-being and prosperity and not otherwise Though mining leads to economic growth and prosperity, provides large employment to locals, yet there is general public perception that mining degrade social environment, habitat destruction, and pollute the environment severely. It is strongly believed that mining and environment are two banks of a river where they can never meet.

### IV. WHAT IS SUSTAINABILITY?

An often quoted, sustainable development is as defined by UN World Commission on Environment and Development: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

The mining industry may come in conflict with some mentioned definitions. Question is, can mining be sustainable??. Yes, because mining is inseparable part of social development. Responsible mining can avoid and minimise negative impact to the environment.

UNCED, Rio Janerio had further defined it like a balanced development between economy, ecology and social needs. An ever increasing shift of rural population to mining industry and subsequently to urban area requires widespread adoption of sustainability.

### V. SUSTAINABLE DEVELOPMENT GOALS FOR MINERAL INDUSTRY (SDG)

Contrary to manufacturing industry, in mining industry there are unique consideration:

Location of a mining project cannot be freely chosen but location bound, connected to the deposit.

Depending the deposit, engagement of mining in natural and social environment can be long term and in large scale otherwise in small

### VI. THE GOALS OF SUSTAINABLE MINERAL DEVELOPMENT:

To maximise the use of valuable components of a mineral deposit.

To use the valuable mineral in residues of raw material extraction and processing,

To develop and practice environmentally friendly mining technology,

To ensure fast and high-quality rehabilitation of waste land,

To ensure public and occupational health and safety at all stages of mining process.



Mining is a complex and intensive process that can have major environmental and social impacts. In even the best-managed mines some degree of disturbance is inevitable. In some cases the potential for harm may mean that a decision not to mine may be the best option. However in most cases the most negative social and environmental impacts can be avoided if companies operate according to best practice standards of Mining and committed to Sustainable Social Developments. Sustainable social development includes various disciplines like:

## VII. SUSTAINABLE MINING EDUCATION.

Engineering mind-set has three essential properties:

Ability to SEE

Ability to HEAR

Ability to visualise.

It is up to mining industry players whether they want to attract the best and brightest or wish to ensure that your engg employees are equipped with appropriate knowledge and skill to meet the goals of sustainability. As of now a mining engineer confronts environment and social conflict challenges at a very advance stage of employment, unaware, unprepared and becomes victim. Basic Issues to be appraised in Mining Engg Education:

Discipline,

Innovation

Responsible Mining

Environment

Public Safety

Ethics

Economical development

Cultural

Compliance to legal provisions

Health and hygiene

Mining engineers needed to be environmentally educated, be aware of social responsibility so that they understand the issues involved in sustainable social development, innovative and updating best mining practice to cleaner production and leads to sustainable social development. Mining ceases to exist if it does not assure sustainable rural development . Sustainability content need to be well integrated into the course (principles, theory and application).

Worked examples, case studies, addressing sustainability issues and innovations of relevance to the discipline area may be part of curriculum. Innovation new ways of executing any operation of mining and regular up-gradation are the key points of achieving SDG. All efforts aim at mining responsible to society.

The curriculum in engg education needs to be renewed to meet challenges of rapidly achieving sustainable development goals. It is critical that mining engg graduates are equipped with the relevant knowledge to effectively meet sustainable goals of safe drinking water, cleaner air, safe waste disposal, safety and transportation.

Mining Engineer has to learn such lesson while executing any mining project that none of his action damages environment or degrade social welfare. Adverse impact of mining on environment and social is inevitable but Min Engg has to innovate ways and means to neutralise each such impact so as mining remains blessing to society.

#### VIII. CONCLUSION

Sustainable education for mining engineer at the foot and start level will play key role so that none of his action damages environment or degrade social welfare.

Social welfare is the ultimate aim and goal of any mining activity. Any activity which is harmful to society or damages environment which can not be repaired/minimised/ rehabilitated can not be sustainable. Bible allows Responsible Mining.

Mining for People needs People for Mining.

#### REFERENCES

1. Mining for the People, Needs People for Mining, Carry Leonida, The Intelligent Miner, 10 th July, 2022.
2. The Role of Education in Sustainable Development Agenda: Empowering a learning society for Sustainability through quality education: Robert J. Didham, Paul Ofei- Manu: Institute for Global Environmental Strategies, July, 2015
3. Innovative Responsible Mining Assurance (IRMA) Standards-2016
4. Engineering Education & Future Challenges, 33 IEI Congress-2018, Prof (Dr) Raghunath K Shevgaonkar , VC Bennett University.

#### BIOGRAPHY

ER Satish Chand Agarwal FIE

An alumnus of BHU(1963) with Gold Medal, served Mining Industry for 50 yrs both in GoI, GoR and Private. Superannuated in 2013 as President ASI(K)Ltd. Received National Mineral Award-2003 (GoI) for innovating an environmental friendly mining technology for Kotah Stone. Widely travelled to Italy, Spain, Moscow, USA, Bulgaria, Singapore, Brazil, Sri-lanka, Malaysia. Published/presented some 120 technical papers in National/International seminar within country and abroad. Recipient of various awards in recognition of meritorious work done in mining industry. A Fellow Member of MGMI, MEAI, and IE(I), Chairman of Kota Local Centre (IEI) 2000-02, felicitated as Outstanding Engineer by Dhanbad Local Centre (IEI) in 2013 and KLC(IEI) in 2021.



Impact Factor: 8.423



# INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  [ijirset@gmail.com](mailto:ijirset@gmail.com)



[www.ijirset.com](http://www.ijirset.com)

Scan to save the contact details