

Sustainable Development and Management of Industries



Environmental Science

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ABSTRACT

We live in a world that is blessed by the beauty of its vast and varied landscapes and the wealth of its natural resources. With the blessing comes the responsibility to ensure its preservation and a healthy environment in a planet that should be pleasant. With the dawn of the 21st century, we are confronted with two conflicting scenarios for the future of mankind. On the one hand, there are possibilities of a bright future with press button living, space shuttles, information technology, genetic engineering and such other advances in science and technology. On the other hand, a grim scenario is looming large with burgeoning population starved of resources and choked by pollution. Faced with such crucial situation wherein we stand at the crossroads in choosing between environment and development we feel the need of 'Sustainable Development'.

Modern human society has developed on account of widespread industrialization, triggered by the industrial revolution of the 18th century. Industries are like necessary evil proving to be a mixed blessing for mankind. The need of the hour is 'sustainable industrialization' which would stress on strategy for protecting the environment, safety of consumer products and the producers(workers)in industries, while improving efficiency and profitability to the company.

Introduction

In 1987 the world commission on environment and development to the United Nations (UNCED) was established. The Commission published famous Burndtland report which defined sustainable development as

"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

This has been interpreted as meaning that each generation must rely on the use of renewable resources and should reuse and recycle waste materials before considering taking new resources from the earth which cannot be replaced. In this way we must adopt a way of life which passes on the earth's resources undiminished to the next generation. The key objective of sustainability includes:

Reviving economic growth so that it has a reduced impact on the environment by using

Less materials and energy

Ensuring a sustainable level of population

Conserving and enhancing our natural resource base

Reorienting technology and managing risk.

Merging ecological and economic considerations in decision making.

We need to plan for 'development without destruction' and manage our environment based on the ethical principle of socio-economic equality and ecological sustainability. Environmental management and sustainable development programs should go hand in hand. The key to growing sustainable is not to produce less but to produce differently in a way which is environmentally friendly and compatible i.e. by embracing the philosophy of 'Cleaner Production'; not to consume less but to consume judiciously and efficiently within the regenerative capacity of the Earth ecosystems and with minimum waste generation.

Global targets of Development

There have been various meetings on the issue of development. The most important amongst them have been: Agenda 21, Millennium Development goals (MDGs), Johannesburg Summit, and the World Summit on Information Society. The Millennium

Declaration was adopted by the member states of the UN in September 2000, and this was followed by the Millennium Development Goals.

Millennium Development Goals:

Eradicate Extreme Poverty and hunger

Achieve universal primary education

Promote gender equality and empower women

Reduce child mortality.

Improve maternal health.

Combat HIV/AIDS, malaria and other diseases.

Ensure environmental sustainability.

Develop a global partnership for development.

Management of Industries for Sustainable Development

Industries are like 'necessary evil'. Modern human society has been developed on account of widespread industrialization triggered by the 'industrial revolution' of the 18th century. But this is proving to be a mixed blessing for mankind. Industries need to embark on 'cleaner production systems' by reducing their dependence on the use of 'toxic chemicals' in industrial operation and processing 'fossil fuels' as the source of energy. In the 'environmental Guidelines for World industries' produced in 1974 and later updated in 1981 by The International Chamber of Commerce it was clearly outlined that the industrialists should emphasize for the use of non polluting sources of energy in industrial operation and called for high standards of commitments for environmental safety by industrialists. In 1984, in the 'World Industry conference on Environmental Management' held in France practical guidelines for health and environmental protection from industrial wastes and pollution was given. The U.N agency, United Nations Industrial development Organisation (UNIDO) was specially created to conceive and coordinate the concept of sustainable industrialization throughout the world.

Cleaner Production

Cleaner production provides a practical way of moving towards sustainable industrialization. It allows the producers of industrial goods and the providers of services to produce more with less raw material, less energy and water, less waste and thus less

environmental impact- all contributing to sustainability. Industries should be designed to have 'in-built systems' of pollution control, waste reduction & recycling and powered by 'natural gas' and eventually by 'hydrogen fuel'. In the wake of industrialization and development enormous use of chemicals, often toxic and hazardous has occurred with consequent generation of toxic wastes and pollutants all over the world. This has serious consequences for human health and the environment. Several of the chemicals used in industrial processing for production of consumer goods are potentially 'carcinogenic'. Although the industrial wastes are being managed by various waste treatment technologies yet the risk to human health and environment continues in several cases.

Sustainable industrialization is a 'win-win' strategy protecting the environment, the health of people, safety of consumers of products and the producers (workers) in industries, while improving efficiency and profitability to the company.

Objectives of Sustainable Industrialization

It involves systematic addressing all phases of 'industrial production process' and 'product life cycle'. It has multiple objectives-

1. Eliminating the use of toxic chemicals and hazardous materials from the production process and environmentally benign alternatives and substitutes. The objective of waste reduction is not only reduction in 'quantity' but the 'toxicity' of the waste.
2. Eliminating the production and use of chemicals (refrigerants, dry-cleaning and foaming agents) that has potential to deplete stratospheric ozone.
3. Improving the effacing of water, energy and material use in production process.
4. Efficient use of scarce and non renewable natural resources.
5. Reducing the emission of green house gases (carbon dioxide, methane, CFC, and oxides of nitrogen which induce global warming) from production process.
6. Promoting the production of 'durable', 'repairable', and 'recyclable' consumer goods instead of 'disposables' and goods of one-time use so as to minimise waste at consumer level.

Management of toxic and hazardous waste by the industries

Industries using toxic chemical and generating hazardous waste have become highly sensitive to the potential social (health), legal, economic, and ecological liabilities associated with generation of hazardous wastes. The liabilities are not only limited to the cost of storage, transport and safe disposal but also cleaning up the contaminated sites and for the adverse health effects on people accidentally exposed to the waste. Therefore, the less waste generated means the less waste to store, transport, treat and dispose, and reduced liabilities for any spills, accidents and environmental disasters. Further, less toxic wastes are generally easier to handle and less costly to dispose off. Finally, it may be less costly to reduce hazardous wastes at source than to pay for the remedial measures.

Benefits of Sustainable Industrialization

Economic benefits to the industry:

There are several tangible and intangible economic benefits to the industries.

1. Investment made and the expenditures incurred on the changeover to sustainable industrialization through cleaner production technologies are paid back to the industries in some years by way of-

- a. Reduced cost of treatment and disposal of waste and control of pollution
 - b. Saving made on conservation of energy, water and other raw materials.
 - c. Savings made on payments of water and electricity bill and on the medical bills of the industrial workers.
 - d. Savings made on the payments of 'wastes and pollution taxes'.
2. No fear of bureaucratic exploitation by the government agencies and the pollution control boards. Industries often have to pay heavy fines for not complying with the rules and prescribed limits of emission and waste generation.
 3. No risk of public opposition and litigation and reduced public health liabilities.
 4. Reduced compliance cost for permits, monitoring and enforcement.
 5. No expenditure is incurred on the management of hazardous wastes and on the pollution control devices and consequent saving and higher profit margins.
 6. Reduced cost of storage, transportation and disposal of hazardous wastes and on the pollution control devices and consequent saving and higher profit margins.
 7. Lower long term environmental liability and insurance cost.
 8. Reduced production cost through better management and efficiency and production of better consumer goods without potential risk to the health of the consumers.

Social benefits to the public and workers:

A global movement is spearheading across the world to make the world 'clean and green'. It is important that the general public understands the social and environmental benefits to sustainable industrialization.

1. No risk or very low risk of 'occupational health hazards' to the industrial workers.
2. Reduced health risks to society from waste and pollution.
3. Clean chemical-free, non-toxic goods for societal consumption.

Approaches to Sustainable Industrialization

There can be several approaches to sustainable industrialization

1. Improving process technology and equipment that alter the primary source of waste generation. By changes in the process itself, it may be possible to reduce the amount and toxicity of the wastes generated.
2. Improving plant operations, such as housekeeping, materials handling, and equipment maintenance, monitoring and tracking, automating process equipment and integrating mass balance calculations into process design.
3. Substituting raw materials that introduce fewer hazardous or smaller quantities of such substances into production process.
4. Redesigning or reformulating the industrial end products.

Recycling a potential industrial waste or portion of it 'on the site' where it is generated. Sometimes while restoring to cleaner pro-

duction some by products are inevitably products are inevitable produced which is recycled.

A reduction in volume of hazardous wastes will lessen the environmental impact, decrease the complexity of waste transport and disposal, lower the operating cost of industries and reduce potential liability.

Conclusion:

It is impossible to separate economic development issues from environmental issues. Sustainability in human society with good quality of life for all can be achieved in two ways:

By persuading the people to behave ethically towards environment, reduce consumption and have a simpler life style.

By embracing the philosophy of sustainable development with appropriate technologies that allow people to enjoy the same good quality of life with high standard of living but at a significantly lower 'environmental cost.'

Given the difficulty of changing people the second option appears more pragmatic. Mankind will perish if the protection of the environment does not become an integral part of all technological development, planning and management. Make economic development programs less dependent upon the 'fossil fuels' and more dependent on renewable energy sources is the need of the hour.

REFERENCE

- Ruhl, J. B (1999). Sustainable Development: A Five-Dimensional Algorithm for Environmental Law. Stanford Environmental Law Journal, Vol.18. | 2. Uberoi, N.K (2007). Environmental Management, Excel Books, New Delhi, pp. 2-3. | 3. Shah, A. (2011). Sustainable Development Introduction. Global Issues. <http://www.globalissues.org/article/408/sustainable-development-introduction> (accessed on 18 Nov.2009) | 4. Agrawal V.P & Rana S.V (1996). Environment and Natural Resources, Jaagmander, New Delhi. |