

## Studying the Importance of Green Industry Formation for Decreasing Environmental Pollution

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**Abstract:** Nowadays, it is believed that we must establish our industrial plans based on our evaluation of their environmental impacts, in a way that we can predict the environmental consequences and the manner in which these schemes can damage the environment. In developing countries, the environmental impacts of the industry have less been regarded, because it is assumed that these industries are of less footprints due to their small scales; but it is noteworthy that although the small-scaled industries are not of meaningful impacts on environment at national or international levels, but their local and regional consequences are high. At the present paper, we try to present some solutions for exiting from the environmental crisis of the industry.

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### Introduction

Last decades of the 20<sup>th</sup> century can be regarded as the emerging periods of many environmental issues; nowadays, the great risk which is felt due to environmental problems not only disturbs the safety and calmness of human life but also endangers his existence. Therefore, alongside other problems which human face with, the danger of environmental balance turbulence is one of main issues of human beings if it is not the most important one.

Environmental pollution of the modern world is a universal issue, which covers different issues such as air pollution, global warming, rising sea levels, endangering plant and animal diversity, attenuation of ozone layer, destruction of jungles, acid rains, sound pollution, nuclear experiments and etc., all of which are the results of human actions. Although human impacts on environment dates back to life on earth, but following industrial revolution and rapid growth of population, the destruction of environment has severely increased; and the development in science and technology have made human beings to subdue environment and gradually but continuously lead it to destruction. Scientific researches indicate that different parts of environment including seas, rivers, air, soil, animals, plants and etc. are related to each other and due to this relationship any pollution can disturb the balance between the aforesaid elements, which causes the emergence of severe crises in the environment (Firouzi, 2005, P 10). For upgrading life quality and welfare of its nation every country depends on its industrial development. On the other hand the healthiness of

mankind is in direct relationship with the cleanliness of their environment (from the air they breathe and water they drink to the soil from which they take their crops) (Karbasi et al, 1997).

Industries are among the main producers of environmental problems and there is a direct relationship between the energy consumed in the industry and environmental issues; that is, non-optimal consumption of fossil fuels and unsuitable use of raw material will lead to the increase in energy loss (Shafizade, 2010). Developing countries are in the process of industrialization, which means that environmental consequences will be increased. Environmental pollution has become a serious problem in all over the world, especially in developing countries, which are faced with an environmental crisis. Environmental crisis have affected billionsof people across the world and shorten the duration of their lives and have a detrimental effect on children's growth. World Health Organization estimates that 25 percent of total mortalities in the developing countries are in direct relationship with the problems caused by air pollution and its consequences; environmental crisis is due to the increase in regional and industrial activities, and growth of urban population. Among developing countries India is a country with critical air pollution challenges (central institute for Controlling Environmental Pollution in India, 2009-2010). The main reason for this problem is the regional concentration of industries, especially industrial clusters; in a research by central institute for Controlling Environmental Pollution in India (2009), after determining the main regions, which

generate the aforesaid problems, they were classified according to the degree of their pollution; the results show that industrial clusters are of bad effects on environment, in a way that in the comprehensive list of CEPI for air pollution they obtain the average scores of 7/0 and higher than 7/0, which is considered as a serious threat for the environment in the said list (central institute for Controlling Environmental Pollution in India, 2010).

#### **Definition of environment**

Environment include air, water, soil, plant, forest, pasture, sea, lake, river, spring, aquatics, animals, mountain, plain, desert, village or city (including alley, street, building, factory, ...) and etc. (Gholamali Banan P 5).

#### **Environment pollution**

##### **Definition of pollution**

Article 9 of environment conservation and reformation approved in 1974 present the following definition for the environment pollution:

“By environment pollution we mean diffusion or mixing of external substances to water, air, soil or earth to an extent that changes their physical, chemical or biological qualities, which is harmful for mankind, animals, and plants.”

#### **The evolution of environmental strategies in the industry**

The development of environment conservation strategies in the industry indicate that environmental approaches are improving and this is related to the expansion of the concept of development. In this developing direction, there are different industrial strategies, which include:

##### **1. Ignoring the problem:**

Before 1960s, environmental issues were ignored in industrial approaches; and it can be said that this is because of the lack of any especial approach at that time. Therefore, different wastages (such as wastewater, pollutant gases, and solid wastes) were entered directly to the environment.

##### **2. Dilution:**

From 1960s, the tendency toward environmental issues has started in the industry as a movement. But it is clear that environmental considerations are something new in these strategies. The 1960s strategy is known as dilution. In this approach the ratio of raw materials (inputs) is meaningfully higher than the ratio of products (outputs). The said difference was entered to the environment in the form of pollutants. This strategy is implemented according to the supposition, which indicate that dilution of wastes and pollutants will decrease environmental problems. At this stage, employing environmental technology was started with building long smokestacks and adding high amount of water to decrease the relative density of Poisonous substances.

Although these measures require less costs, but ecologically they are harmful.

##### **3. Controlling pollution in the final line**

In 1970s, with the increase of people's knowledge and awareness about environmental processes and their destruction and also with the expansion in the concept of development, the control technology strategy in the finishing line of the production is emerged. Still, the ratio of raw material (input) was remarkably higher than the products (outputs). In this strategy we use controlling techniques to prevent harmful substances from entering to the environment. The use of catalyzing transformers and store tanks are among the techniques used in the finishing line. The techniques used at the end of product line, always require extra money and resources. Moreover, it is they are susceptible to destruction. Generally, the techniques used at the end of product line, instead of making ecological improvement in technical productivity of the resources, make it worse. For example, the detrimental and dangerous substances are trapped in the filters, which must be removed. That is, the pollution is not removed but it is turned to other forms. For example it turns into pollutions with low volume but high density (sludge). But with regard to preventing the emission of pollutant gases to environment, some of the techniques used at the end of the product line are very effective; hence in the areas with high population the use of such methods are inevitable.

##### **4. Recycling:**

In 1980s, there was another development in environmental approach, which is called recycling. The main idea in this approach is that the thing that is not entered into environment will not damage it. Also it is believed that by utilizing secondary substances instead of utilizing first hand natural resources, we will reduce the economical inputs too. This approach has reached to great success in some fields like glass, paper, and aluminum. But few percent of the resources has recycled in the production cycle. In addition, for construction and utilization of the required equipment, we need more energy and resources.

##### **5. Pollution Prevention**

From 1989 there emerged some approaches, which are called pollution prevention. The strategies of this approach is to prevent production of pollution (Mardan, 2007).

#### **Environmental activities of Iran's department of mine and industry**

##### **Directive and supportive structures**

With codifying strategies needed to achieve sustainable development in this area and for optimal using of relative advantages, the department for mine and industry provide the section of comprehensive plan studies for economical development of the country

in the framework of sustainable development. The main environmental purposes of these plans, is to identify new methods of employing raw material and mineral reserves according to environmental considerations; this is in line with identifying technological basis and continuation of the rapid growth of industrial and mineral activities in conjunction with preserving environmental capitals; moreover it is due to promoting technical knowledge, proficiency and innovation in the field of environmental management and engineering for upgrading technology level; it is also in line with modern technologies for developing self-reliance in designing and manufacturing of the foresaid engineering services and equipment and finally for achieving to a suitable environmental position simultaneously with mineral and industrial expansion.

#### **Engineering activities with reliance on controlling pollution**

For observing rules and meeting the defined standards, the industry owners and managers have used to refine pollutants at the final point before discharging it to the environment. If every company is supposed to be capable of refining its pollutants economically and technologically, in this case the only things that these companies will do is to change pollutants from one form to another and to transfer it from one receiving tank to another one; it is not useful economically and not considered a finishing task environmentally. Due to some factors like the diversity of industries in Iran (such as food, chemical, metal and textile industries) and the remarkable differences in the quality of their produced pollutants; and the lack of suitable environmental studies for establishing refinery units, installing equipment for controlling air pollution, and establishing a system for managing solid industrial wastes, require some comprehensive measures, which are in planning and execution stages; among these measures we can name the environmental measures of industrial towns and the establishment of environment bureau in Iranian Industrial towns in 1998. From the said time on, this office have conducted the required studies for collecting and refining wastewater from the industries located in these towns; the result is the establishment and exploitation of more than 38 networks for collecting industrial wastewater, planning and starting the operation for establishing a network to collect wastewater from other 27 industrial towns, starting the operation to design and construct refineries for industrial wastewater treatment in 32 industrial towns, and also creating a system for managing green spaces in 15 industrial towns. On the other hand due to the importance of climate change and its related damages, it is necessary to consider this issue seriously in national, regional and universal levels. At national level we taken the primary steps with the general orientation toward

decreasing the emission of greenhouse gases through improving the structure of fuel, and consuming clean and renewable fuels; and increasing energy efficiency in industrial units through supporting the implementation projects related to the optimization of fuel and energy consumption and the necessity to employ label of energy consumption.

#### **Managerial activities with reliance on pollution prevention**

Following unsuitable response to the environmental issues, there introduce mere technical solutions and techno-managerial methods in Iran and across the world, among which we can name the following:

#### **Environment management system (ISO 14001)**

This system, through applying suitable management, helps organizations to identify the environmental consequences of their activities and continuously improve the environmental aspect of their tasks. This system deals with subjects such as resource allocation, liability sharing, implementation of environmental plans, and finally regular evaluation of processes and methods. Activities like identifying pollution-generating spots in the process and presenting some solutions for removing them according to some definite schedules, implementing the plan, evaluating the implemented measures, reviewing and making a correction in the direction of this standard's requirements are related to the environmental issues. This system is applicable to the organizations, which tend to:

- a) Implement, maintain, and improve an environment management system
- b) Make sure from the its conformity with environmental policy
- c) Prove this conformity to others
- d) Ask for license and register its environment management by an external organization
- e) Make conformity with this standard and its statement by the organization itself

Although observing these standards can be according to self-statement, but due to different reasons such as customers' tendency or commitment, remaining in the competitive markets, increasing their extent of function, or for assuring local organizations in charge of environment, most of industries try to acquire license from reliable companies (Green Identity Card, 2003, PP 130-135).

#### **Green productivity and cleaner production**

These two universal and strategic methods are for creating the required changes in the existing technology and industry for building a society on the basis of sustainable development. These methods focus on the optimal efficiency in energy consumption, water and raw material in the processes, methods and production of the required products; on the other hand the emphasis

is oncomprehensive management of decreasing wastes and their auditing from the beginning of the production to its end and also on employing methods of production, which impose less pollution to the environment.

Cleaner production approach, as the first tool for accessing to sustainable development is predicted in 21<sup>st</sup> program; its emphasis is mainly on implementing this scheme in the existing productive units to identify environmental problems in the production line and try to reduce them and reach to a cleaner production line. More than 13 centers for promotion of cleaner production culture have been established hitherto throughout the world. Iranian Mine and Industry section has also focused on these two approaches and covers different projects in this area (Green Identity Card, 2003, PP 130- 135).

#### **Activities with reliance on producing environmentally friend products**

In achieving to environmentally friend products, some measures have taken by legislative sections, which leads to the following activities:

Different approaches for preventing industries from environmental Pollutions (Mardan, 2005)

Prevention approaches have different names among which we can name the followings:

- Green productivity
- Pollution prevention
- Minimizing wastes
- Environmental planning
- Clean production and cleaner production

There are no meaningful differences between these names, but their difference is mainly due to the degree of their emphasis on environment and industry.

#### **Conclusion**

There 4 basic tools, which can identify the opportunities in the industries for saving energy consumption and reducing environmental pollution; they are:

- Auditing waste decrease
- Auditing the destructive effects of industry on environment:

With this auditing the destructive and heterogeneous effects are identified by means of environmental codes, and this paves the way for future standards.

Identifying the useful life time of the product:

With this tool we can identify the environmental effects of production from extracting raw material to final wastage and introduce economical strategies for minimizing the wastage.

Identifying the environmental impacts:

It identifies the executive effects of industrial projects on environment and suggests some suitable solutions for preventing them.

The time and benefits of utilizing these tools (when we must use them and what benefits they will have)

Auditing waste decrease

It is when the industry tries to decrease the use of raw material, input energy and production wastes; and the benefit is in its financial saving.

Auditing the destructive effects of industry on environment:

It is when the industry has to define environmental measures on the basis of the current rules and standards. This increases the overall level of awareness in the employees in different areas.

Identifying the useful life time of the product:

It is when a new factory is built or where old technologies or products replaced by new ones; this leads to defining economically effective methods, which prevents pollution or decrease it.

Identifying the environmental impacts:

It is when a new factory is built or the existing factory changes permanently; in this case instead of spending heavy costs for controlling pollution, low-cost preventive methods is presented.

Executive measures for removing limitations:

For removing the aforementioned limitations, it is necessary to predict some preventive measures in each section; these measures can be defined for three different sections of industry, government, and international organizations.

Industry:

The required measurement for preventing pollution

Persuading and informing employees in all levels about environment and energy.

Codifying and executing a suitable method in production line in line with the aforementioned goals

Expanding the utilization of environmentally friend technologies

Government:

Revising policies and rules related to environment and energy

Using more effective methods for controlling rules and disciplines

Persuading government to use these technologies through research and training

International organizations:

Activating financial resources for supporting the said projects

Persuading the transmission of cleaner production technologies

Encouraging organizations to environmentally friend trading, marketing, and processes.

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