

# The Role of Total Quality Management in the Environment

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## ABSTRACT

Today, environmental protection as a strategic tool of modern business is one of needs for customers-competitive pressures and opportunities of environmental resources. This method is closely associated with quality management. Using appropriate methods of energy is a tool that will change consumption pattern. This can help reduce the environmental costs and increase economic benefits. Also, pollution prevention (PP) is an effective way for the factory production process that does not have any significant waste and inefficiency. Used actions in the PP approach have different levels of complexity. Studies indicate that technological innovations in industrial activities have rarely been done in developing countries.

**Keywords:** Quality, Environment, Organization, Pollution Prevention

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## 1. INTRODUCTION

In times of uncertainty, managers need a way a mechanism, a procedure, a methodology to monitor and react to the environment (Rezvani, Gilaninia, Mousavian, 2011) Developing countries are over two-way choices. Rapid economic growth, industry regardless the consequences of environmental and sustainable industrial development strategy based on combining ecological and economic considerations (Yhdego 1995).

Developed industrial countries in the process of environmental pollution management have gone industrial activities through three periods.

- 1- Disposal and release non-standard and control of types of waste (Gas, Liquid, and Solid) to the late 1960s.
- 2- Protection of environmental quality through standard of waste disposal in the 1970s and 1980s.
- 3- Resources Management through recycling of waste materials, reduce or prevent the occurrence of pollution and increasing energy the efficiency since the mid-1980s.

Since the 1980s, approaches entitled "Pollution Prevention" (PP) with different terms, but with a similar nature, have become common in developed countries Undo edits that can cite terms of the cleaner technology (England), cleaner production (United Europe) and under these terms namely the pollution prevention in the United States. Preferred approach to continuous improvement of industrial production as the foundation of this approach is consistent from beginning to End of Pipe (input, process, and product) to the traditional approach of complete control at the End of Pipe.

Environmental protection issues in developing countries are facing with numerous challenges (Word Bank, 1990) that most important include:

- Weakness in planning systems and organizational and institutional capacities.
- Distribution of responsibilities among a number of sections.
- Lack of strategy patterns in ecological sustainable development.
- Low skill levels.
- Weakness in non-governmental organizations and the lack of effective public pressure on governments.
- Weak administrative and legal guarantees.
- Poverty and underdevelopment.

Methods of Industrial pollution control in developing countries is based generally approach "Command and Control" and performed at the end of production line and final disposal.

Standard-based approach including approach "Command and Control" will only be considered the final output and while PP of the new approach covered all path of industrial production including resource consumption, processing and final product quality.

Approach PP is active approach in environmental management, for realization of ecological industry development. Some experts believe that, developing countries should be adopted this approach with mutation through a restructuring of its industrial activities and development of dynamic industry organizations and activities.

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Developing countries have a hard way to implement the PP approach, because major emergency in this country is yet provide sufficient food and adequate housing for very high population countries. In countries with widespread unemployment and social and political issues arising from it, massive unemployment and expansion of rising unemployment rate are considered very important politically than the costs of environmental degradation and developing countries government evaluate environmental issues and especially new approaches PP for these countries very luxurious. In new business ventures, the behavior of companies is still unknown (Gilaninia, Mousavian, 2011).

According to Chinese government representative commented on the UNEP Environmental Conference in London (1990): "Today's developed countries have received current levels of welfare and development through environmental degradation and now these countries have this capacity that part of accumulated wealth spend to environmental management while there isn't such a possibility about present developing countries". Although the above subject is express that developing countries shouldn't repeated past mistakes of developed countries in field of environmental degradation. Although cleaner production technologies are require a higher initial investment costs compared with conventional solutions, but at the same time, this additional costs compensation through saved and reduced raw material consumption, reduction of the level of refinement required and the amount reduction of fines, and in other words it is a kind of reversible investments that its benefits compensate performed costs while made costs about end refinement systems are not reversible costs, moreover, again cost is frequently necessary for depreciation of such equipments. PP approach adopted by the industry, especially in developing countries requires changes at the micro and macro levels. At the macro level, governments should put motivation and incentive strategies on the agenda in line with expansion of flourishing industries and organizations and at the micro level, organizations and the industries should pursue strengthen strategies of the competitiveness. In this paper with describes step by step the dynamic and static organizations, the evolution quality concepts, analyze the challenges and potentials of PP approach, is being discussed importance of adopted this approach.

## **2- Static and dynamic organization**

Each organization has special philosophy, beliefs, values and norms (Gilaninia, 2011). Organizations in connection with environmental protection are in the two major groups, static and dynamic organizations. Static organizations are organizations that element of competition and ability to maintain competitiveness is not the main factor in how their activity, activities conditions in this organization is its main reason that mainly monopoly conditions and consumer is specified and fixed. approach of this organizations to environmental protection issues is as duty and compulsory and level of environmental considerations such organizations is partially respond to existing laws and regulations.

Because in such organizations, due to the activities conditions means non-competitive and monopolistic conditions, elements of efficiency, productivity and customer satisfaction, are not central effective factors, practical approach to deal with industrial pollution in control law and a strong executive guarantees is a corrective approach and refining pollution at End of Pipe (EoP). Therefore static organizations relying on corrective approach, only for the pollution occurred at End of Pipe is spend through installation and application of relevant technologies that in many cases, these costs is very high due to the expensive technologies needed and to imported. On the other hand, because this approach is not face with pollution-generating sources in origin; pollution producer factors are continuing and thus extensive technologies of pollution refining associated with depreciation costs are always necessary.

Dynamic organizations are against organizations static. Elements of competition, consumer satisfaction and public image organizations at the level of inside and outside have the major role in how their activity; element of competition and ability to maintain a competitive power is caused that elements efficiency and productivity in these organizations have a central role. Such organizations to raise efficiency and productivity level investigated continuously all path production for reducing input amount, select the correct of needed input, to optimize processes and to enhance the quality level of final product. Approach used in these organizations is associated with maintaining environmental quality, approaches to prevent the occurrence pollution with change headings and reducing consumed materials, process improvement, and waste reduction and re-design the final product.

## **3- Quality in Organizations**

Quality factor and how supply and control in industrial activities is a fundamental factor for the survival and the persistence of industrial organizations because quality factor in open economic conditions is indicated competition capacity and innovation in an organization or industry. Organizations are able to surpass its competitors in open economies that provide higher levels of quality and organizations with sufficient and effective competitive power survival can continue their survival and the persistence. Thus quality supply is competitiveness condition for organizations; competitiveness condition for organizations is condition for its persistence, as a result foundation of every organization is depends on the level and amount of quality. But the quality issue is relative and during the course of historical and industrial activities, defined and concept of quality has changed according to welfare level and knowledge society and speed of information flow. In cross-sectional, consider quality in industrial activities was centered purely on

products offered by its activity and major efforts Industry Owners focus on providing products with the highest functional quality. This section includes two periods. In first period was conducted evaluation and quality control in the final products and in other period was conducted provide quality through control and examination the whole path of production (input, product process), use of effective energy at all levels of employees through their participation in process of producing goods and services and survey customer satisfaction. Thus, common attribution in this period have been focus on conculations and survey on quality of good and services. In the second stage that we are in it, with spread of customers' awareness and information processing speed will expand range of customers and also covers the quality of their environment and having a secure and stable environment are as well as customers' priorities and preferences. With this evolution, organizations broaden the scope of their obligations and environmental considerations also enter into their calculations because they affect in strength of competitiveness. This influence is done two ways. First through environmental laws and regulations is broader their scope by increasing social demands, and other through luck or no luck people (customers) to various industries products based on amount of their commitment to environmental sensitivity. These three historical periods related to quality in texts and literatures have been categorized as follows (Madu, 1995).

1- Traditional Quality Assurance (TQA)

2- Total Quality Management (TQM)

3- Stragegical Total Quality Management (STQM)

Charectersized aspect STQM is Application of PP approach that Based on the all production process, including selection of kind and amount raw materials, production processes, product design and waste and how to participation of employees in all levels of organization with goal of reduction pollution investigate countinuly.

In process of globalization and economic liberalization, environmental approach adopted by the industry is inevitable. Sensitivity of this issue is higher for industries in developing countries.

#### 4 - Potential approaches PP

How playing the role of industry in sustainable development strategies is the major issues because industry activities is one of important resource pollution, both in developing countries and developed countries. In developed countries , strong legal frameworks and public awareness and sensitivity is the main factors pressure on industry owners to reduce industrial pollution, while in developing countries are seen less. developing countries should take fundamental steps in regard to promotion used technology and methods of reduce costs that this approach can allowed positive environmental outcomes.

According to traditional view about the relationship between environmental protection and the costs of the private sector, in terms of environmental laws and regulations on industrial activity will increase investments and operating costs and therefore conclusion is that increased attention to environmental standards due to higher costs and investment will caused lower economic growth. The traditional view has been exposed much criticism. The traditional view about the relationship between environmental protection and the costs of private sector is based on a static thinking that based on it, technology and customer needs is fixed, existing information is complete and opportunities for new innovation and initiatives isn't perceived and all opportunities have been used, while the foundation of the new approach is founded on continuous and dynamic competition. Based on this view, at any level of information there is still need for new information and in any position of power and organizational capacity, there will the need and opportunities and to improve and change it. Based on modern thinking and dynamic, if environmental standards are designed well can be caused Innovations that part or all costs compensate in the field of Environment protection.

Tools and options raised in the PP approach include: (OTA 1994)

- Optimal internal management of the factory
- Reform the operation and maintenance process
- Change of production formula
- Replacement of Raw material consumption
- reform of Simplify process in the existing technologies
- Technological innovation
- Recycled materials

There are many similarities between PP and total quality management approach (TQM) as essential tool in an empowerment industry to maintain and strengthen competitiveness in open economies that it can be noted the following cases: (OTA, 1994)

In both, firms examine their production process in great detail and focus on continually improving the process to improve quality and productivity and reduce scrap and pollution. Both practices incorporate new cost accounting and measurement to assign all costs to particular products or production processes. Benchmarking progress is encouraged in both. In TQM, firms strive for zero defects, while in the best pollution prevention efforts, firms strive for zero discharge the process of decisionmaking is also similar. Both practices aim to involve all parts of company, rather than just the quality or environmental departments. For example, in pollution prevention, representatives from purchasing, marketing, R&D, production, and design are all encouraged to work together to find ways to prevent pollution. Similarly, both stress

the importance of workforce involvement and the key role of shop-floor workers in improving quality and preventing pollution. Many programs report that their best suggestions to prevent pollution come from the shop floor employees. Both pollution prevention and manufacturing modernization efforts succeed best when shop-floor employees are involved.

PP approach means the transition from the payment by polluted through restructuring of industrial economic based on ecological development principles through consumer resource management, waste reduction and recycling materials in place and using them in the same of industrial activity. Analyses of more than 500 of industrial activity have implemented cleaner production methods in America have shown that these organizations have been able to reduce of industrial waste at about 85-100%. In developing countries there are also examples of successful application of PP approach (Yhdego, 1995). The mentoring relationship is valuable (Soufi, Gilaninia, 2011). Control and monitor approach to ensure is required to standard of affairs but is emphasized consideration to PP approaches as the first option.

Some exogenous and endogenous factors are effect for adaption PP approaches (Hanrahan, 1995). A suitable legal framework is as one of the main requirements development and expansion PP approaches and its program. Internal dynamics, capacity management, production and innovation are some other factors in the adoption of PP approach by industry participants and lack of adequate information about the feasibility and costs required to implement the approach to PP is evaluated a serious obstacle for the implementation PP approach (OTA 1994). Logistics deficiencies such as lack of technology required and initial willingness of industry participants to use the traditional solutions (EoP) is deterrent factors the development of PP approaches. About developing countries consequences of environmental laws and regulations on economic growth and ability to maintain the competitive strength in industry is major topics. Economic liberalization, pressure from transnational corporations to comply with environmental issues by affiliated companies and increased concern from local communities about environmental quality is effective motivation or compelling factors for application and adoption of technologies and methods for reducing pollution in developing countries.

But in any case, the positive effects of transnational corporations are depending on the accumulated technological and productive capacities of industry in the fields of infrastructure structures, quality and level of human resources and public policies (Dahlman, 1992).

### **5-Active approach and based on prevention**

With increased interest and attention of international organizations and especially Japanese organizations, in developing technologies and compatible products with environment, adoption of active approach and based on prevention by organization is major factors in maintain their competitive strength in the market conditions. Consumer groups is pressure on organizations in order planning to maintain quality of the environment and with the spread of information technologies, they will be able to develop domain of its impact to other countries and among developing countries. In this regard, the organizations that refuse to use methods based on prevention will lose their image among consumers that this is a very important effect on the survival and the persistence of organizations. Obviously, organization cost in order to programs of environment protect and use of prevention methods, in early stages may be too high, but their potential benefits in increasing the competitive strength and ability to acquire new markets will be offset these costs. Exxon company in 1989 caused oil materials flow in region in Alaska, More than one billion for a clean environment, and about 91 million dollars to be paid compensation for fisheries losses (Bovee 1992). Gradually organizations with little attention to to the protection of environmental quality and organizations with activities, which may lead cause environmental disasters understand continuing In this process will have adverse effects organizations on the positive reputation

### **6- Discussion and Conclusion**

Globalization is mean to unlimited competition, development, inefficient loss of boundaries between countries, cultures and organizations in the areas of public and private(soufi,gilaninia,mousavian,2011).The new wave of globalization and economic have been linked liberalization, durability and stability of the organization based on four factors together.

- 1- Continuous change and innovation
- 2- Efficiency and effectiveness
- 3- Competition
- 4- Promotion needs growth of communities

If in the past and in some cases, in the current conditions, some organizations in number of countries, because their support conditions inside national boundaries could survive and persistence without attention to the mentioned factors give continuation, the creation conditions by new wave, continuing the trend has been faced problem. Organizations that can not properly diagnosed opportunities and appropriate to them, make necessary changes in itself order to gain a positive image, innovations and realize initiatives necessary, organizations that are not able considered to use the resources, elements and efficiency the effectiveness and organizations that are unable to respond to the demands

and promotion needs growth of communities based on having a safe and healthy environment and quality, will not survive and quickly removed. Organizations future is depend on simultaneously calculated two variables.

1- An economic efficiency

2- Environmental Quality Assurance

The first variable will affect inter competition of industry with each other and suggests that organization with same or more quality and with low price have chance of more competition and persistence. However, second variable is related to the flourishing era of information and communication and or information and communication technologies and formation of promotion needs in communities. If industries and organization in developed countries can't face with two variables principally, not only will lose their domestic markets, but as well as will lose markets in other countries. Therefore these countries should have following fundamental solutions. This solution can be placed in three categories.

1- Fundamental review in policies and strategies of industrial

2- Second restructuring of existing industries

3- Change functional method of existing industries

In demition of policy and determining strategies must be planned for industries that have need dynamics for adapting to new conditions of globalization. In topic restructuring, the existing industry should reform their view the according to new condition and their survival and life conditions re-defined in accordance with it. But new approach uses in environmental topics ie PP approach have incompatible in no way with the static organization and thus in two macro and micro level provide field for implementation PP approach through providing conditions for starting and growing a dynamic industry and restructuring the existing industries.

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