

Investigating the role of green supply chain in protecting the environment with regard to green productivity in an effort to achieve sustainable development

Dr Jalil Badam Firouz^{1*} and Aida Shariatmadari²

- 1- Assistant Professor, Head of the Institute for Environment and Sustainable Development, Environmental Protection Agency, Tehran, Iran (corresponding author) *
- 2- Ph.D. in Environmental Management, Faculty of Natural Resources and the Environment, Islamic Azad University, Science and Research Branch, Tehran, Iran

Corresponding author: Dr Jalil Badam Firouz

ABSTRACT: Providing suitable foundations for promoting productivity and innovation over optimal use of materials and a favorable environment along with economic and social growth indicators can be achieved through the establishment of a green management system across the country, which is in turn a step in achieving sustainable development. Achieving the goals of sustainable development and economic development accentuate the need for wisely using the country's natural resources. Moreover, following the pattern of consumption is one of the most important strategies for achieving sustainable development. The application of green management can be the first step in achieving this goal, which is not only based on information providing and culture creating, but it is also classified under important details like energy and materials management and environmental protection. Meanwhile, industry leaders, particularly in developed countries, are in quest of ways to enhance the performance of their organization while protecting the environment. A coherent strategy for enhancing productivity in accordance with green management is green productivity, which is the key to sustainable development; one of the tools of this approach is green chain. As a matter of fact, green supply chain is based on the integration of environmental management and supply chain management in order to control environmental impacts on product life cycle by means of information sharing and collaboration between all members of supply chain. Green supply chain management integrate supply chain management into environmental requirements at all stages of product design, selection and supply of raw materials, production and supply of raw materials, distribution and transmission processes, customer delivery and finally after consumption service, recycling and reuse management in an attempt to maximize energy and resources consumption efficiency together with the improvement of the performance of the entire supply chain.

Keywords: green productivity, environment, energy, green supply chain, sustainable development

INTRODUCTION

In different industries, the need for evaluating and selecting technologies to reduce adverse environmental effects is growing, and today more customers are interested in products environmentally friendly. In recent centuries, industrial development has given way to sustainable development. On the one hand, economic activities

including industrial, agricultural and service activities use natural resources and are dependent on them, but on the other hand the nature of their processes is such that they potentially pollute the environment. Therefore, if the environmental consequences and issues of the activities fail to be addressed, then there should be huge costs to fix the loss and damages caused by the lack of attention to this issue. (Huang, 2001). Since adverse environmental effects occur at all stages of product life cycle and management of environmental programs and operations is not limited to the boundaries of organization, the notion of green supply chain management and green productivity as a comprehensive view that encompasses all flows ranging from suppliers to producers and eventually consumers have intrigued many researchers (Zou et al., 2008).

Literature

Principles of productivity (principle of knowledge, motivation, management) and its relationship to quality play an important role in improving productivity of human agent. The enhancement of productivity is realized by combining and integrating different resources, organizing and planning properly and comprehensively. Proper selection of individuals, division of labor, assessment, payment of salary and wages in return for work performed are the backbone and pillars of productivity (Jabari, 2014).

At individual level, green supply chain programs have certain competitive advantages such as lower costs, greener products and better integration with suppliers. At national level, green supply chain can create markets for green products, as well as better harmony between suppliers and environmental problems (Jabari, 2014). Making supply chain greener can improve company's competitive state by reducing costs. In addition to cost reduction, close collaboration with suppliers can end up with green products. Companies need to change their minds about their products and make them more environmentally friendly. In the same vein, they are advised to foster better and closer collaboration with their suppliers in order to be triumphant (Trowbridge, 2003).

Materials and methods :

Green supply chain management integrate supply chain management into environmental requirements at all stages of product design, selection and supply of raw materials, production and supply of raw materials, distribution and transmission processes, customer delivery and finally after consumption service, recycling and reuse management in an attempt to maximize energy and resources consumption efficiency together with the improvement of the performance of the entire supply chain. (Sarkis, 2006). In assessing the environmental impacts of supply chain activities, the analysis of the effects of products on the environment is performed through a holistic approach (including analysis of product life cycle from the beginning to the end of its life). In this approach, all ecological effects (science of habit and how living beings live and their interaction with the environment) of each activity are measured and considered in product design in different stages of product life such as the concept of product, design, procurement of raw materials, manufacturing, assembly, maintenance, packaging, transportation, as well as product reuse (Farahani et al., 2009).

In the 1990s, consistent with the improvement in production capabilities, industry managers realized that materials and services received from different suppliers had a significant impact on expanding organization's capability to meet customer requirements, which in turn had an additional impact on organization's focus, supply bases and sourcing strategies. Similarly, managers found that simply producing a product, i.e. supplying products with standards desired by customer (when, where, how) and good quality and reasonable price, has posed new challenges. In the circumstances, as a conclusion of the changes, they found that the changes are not sufficient to manage their organization in the long run. They need to get involved in the management of the network of all factories and firms that directly and indirectly supplied their organization' input as well as firms linked to customer delivery and after-sale services. With such a view, the approaches 'supply chain' and 'supply chain management' came into play (Jamali, 2012).

Green supply chain

Srivastava (2007) defined green supply chain as follows; "taking account of environmental issues in supply chain management including product design, material selection and sourcing, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life".

Although the concepts of sustainable supply chain management and green supply chain management are often used interchangeably in the literature of supply chain, there are subtle differences in their meanings. Sustainable supply chain management encompasses economic dimensions and social and environmental sustainability, so the concept of sustainable supply chain management is broader than that of green supply chain management, and green supply chain management is part of sustainable supply chain management (Farahani et al., 2009).

in the past, product life cycle included processes from design phase to consumption, while thanks to environmental management approach it now includes processes of raw material procurement, design, construction, use and recycle, reuse and a closed loop of material flow in order to reduce resources and lessen adverse environmental effects (Mosakhani, 2012). The components of green supply chain are green design, green materials, green production, green marketing and green use. The goal of performing these activities is to create harmony between the goals of economic development and environmental development, make an effort to select product and services environmentally friendly, and deal with products detrimental to the environment (TaHERi, 2015).

Green productivity (GP)

Until few decades ago, the natural environment was not seen as an important variable in manufacturing systems. But environmental damage began to endanger the achievements of human civilization. Waste and effluent have contaminated the environment. The devastating effects of excessive use of ecosystems and damage to natural resources, especially non-renewable resources, have raised concerns and led people to find a way to prevent these harmful consequences. The topic of sustainable development model took off as a serious subject since the late 1980s. In 1989, the United Nations Industrial and Environmental Program (UNDP) began to use the term "cleaner production" to illustrate the general and pervasive perception of production and environment. Green productivity is on the agenda of manufacturing sectors. It is viewed as a goal containing various effects on the path to sustainable development, such that it integrates the concepts of the environments into the restoration and protection of natural resources in technical, economic, and strategic affairs of productivity (Abedi, 2016).

Three major strategies for improving productivity

When total productivity increases, full cost of each unit will go down (TaHERi, 2005). Thus, we can take one of three ways to improve productivity by considering the relationship between total productivity, cost and (price= full cost + profit margin)

1. lower product price, which means more market share and then more profit in the future
2. previous price but more earnings per unit
3. lower price and more profit simultaneously

Conclusion:

The studies suggest that today environmental management laying emphasis on environmental protection is one of the most important concerns of customers, staff, and competitors, and global pressures have required organizations to produce environment-friendly products and services. Green supply chain is often held to be a decrease or prevention from using harmful chemical substances, which is a completely false belief because it goes beyond this stage and encompasses all parts of an organization. As a matter of fact, green supply chain is the upshot of the link between organization's economic goals and environmental goals. In general, the concept of total productivity is used in many countries in the world. Certain advantages of application of total productivity management agreed by all individuals are accountability to customer needs, quality competitiveness, full cost competitiveness, workgroup creation and accountability and responsibility, technology planning, investment analysis, planning for starting a new activity or joining another company, budgeting and allocating resources, setting goals for autonomous profit making, adapting information collection instructions in a proper manner; if the total productivity management programs are precisely and purposefully implemented, we will see the amazing growth of productivity in organization. A set of effective and useful impacts of green productivity strategy application to green supply chain of industries are in a nutshell as follows;

1. it guides production units into modification of product process.
2. consumption of raw materials and energy is saved.
3. it increases competition through the application of new advanced technologies
4. it reduces restrictions and prohibitions
5. it reduces the risk of indoor and outdoor refinement, storage and disposal of toxic substances
6. it boosts personnel's health and sanitation
7. it enhances company's social and public position
8. it cuts huge costs of pollution control solutions at the end of the line.

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