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Importance of Green Supply Chain Management in Algerian Construction Industry towards sustainable development

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Abstract

The construction industry is an important business sector providing physical equipment and infrastructure through supply and demand patterns that have a strong indirect impact on other industries. Construction projects require materials and products from other industries such as production and buildings and infrastructure for the benefit of those industries. In terms of economic growth, the building industry is economically important and has strong ties with other segments of the economy especially an important sector of economic growth and expansion in developing countries. The capital market is one of the most important parts of the economy, that it is not covered they're important to anyone (MIR et al., 2020). Sustainable development issues are more than ever focused today on how communities view growth and the responsibility of the government to create ways to adapt to growth and to reduce the carbon footprint of human settlements. This paper has established a methodological basis for potential analysis in the construction industry with a view to the scale of application of green supply chain management in Algerian construction industry. The significance and scope of the study are explained in the paper.

Key words: Implementation, Green Supply Chain Management, Construction Industry

1. INTRODUCTION

In the era of globalization, all countries in the world must face global competition. In recent decades, globalization has brought about major economic, political, cultural and environmental changes, these changes not only offer opportunities for countries and the world (Inglehart, R., 2020). This due to the integration of the global market, alliances and associations, but also provide new challenges, threats and problems for countries around the world. Therefore, obtaining a competitive advantage has become a key objective of the organization (Greckhamer et al.,2018). Many organizations from different economic sectors in different countries look for opportunities and make changes to improve their performance, efficiency, effectiveness and capacity to obtain a better competitive advantage at the local, national, regional and global levels (Horváth et al.,2019).

The construction industry is important in every country, providing physical facilities and infrastructure. Also, the supply and demand model, buildings have a strong indirect effect on other industries (Wibowo et al.,2018). Construction projects require materials or products from other industries, such as manufacturing, for the construction of buildings and infrastructure that benefit these industries (Camacho et al., 2018). This supply and demand pattern has made a significant contribution to economic growth (Chowdhury *et al*., 2009). The construction industry is a complex combination of several economic sectors. The construction industry consists of a complex and diverse process, including many experts, a variety of materials, complete professional equipment, diverse institutions and a wide range of products (Ball, M., 2014).

GSCM contains green purchasing and procurement, green manufacturing and materials management, green packaging, green distribution and marketing and reverse logistics (Nejati *et al*., 2017). Green supply chain management enables companies to achieve their economic goals, reduce environmental risks, minimize negative environmental impacts, and improve the environmental performance of companies and their partners throughout the supply chain (Zhu *et al*., 2008). GSCM is a way to minimize the risk of potential losses due to poor environmental performance (Laari, Töyli, & Ojala, 2017).

Some studies have shown that companies are becoming environmentally friendly due to environmental awareness. (Laari, Töyli, & Ojala, 2017).

2. IMPORTANCE OF CONSTRUCTION INDUSTRY IN THE ECONOMIC SECTOR

The construction industry is an important sector that has made a significant contribution to the economic growth of a country (Ofori, G., 2015). It is an area of investment in which the government has shown great interest. The government signs contracts with the construction industry to develop infrastructure for the health sector, transport and education (Trirat *et al* ,. 2017). The construction industry is typical of the wealth of a country. The construction industry is diversifying, which including real estate developers, real estate developers, material suppliers and contractors (Vanalle et al, 2017). The construction industry provides

cost effective construction solutions and plays an active role in the success of contracts. Besides infrastructure development has enabled many domestic investors to conduct business transactions (Srinivasu et al., 2013). A strong infrastructure can create a healthy working environment, thus increasing the efficiency and labor flexibility.

Major industry companies have already announced a shortage of funds in the construction industry (Nagy et al., 2018). This lack of funding led to a huge gap in the national road infrastructure in 2011 with a housing deficit of 17 million people (World Bank Report 2012). The industry is offering many opportunities in the industry, especially in areas such as building materials, supply chain management, ICT, education and subcontracting (Badi et al., 2019).

3. OVERVIEW OF ALGERIAN CONSTRUCTION INDUSTRY

According to Hussain (2010), the construction industry in developing countries such as Algeria maybe viewed as a sector of the economy which is responsible for the planning, design, construction, maintenance and eventual demolition of buildings and works that enables economic activities to be performed.

Algeria must be more engaged in investments related to sustainable development and passive housing to achieve socio-economic benefits and reduce energy consumption. (Trirat *et al* ,. 2017). The vision of 2029 rehabilitation strategy of Algeria, which includes many mega projects, aims to transform the capital into a "Pearl of the Mediterranean" (Stambouli *et al* ,. 2012). Algerian building regulations must ensure safety, stability, hygiene and comfort requirements to meet social and environmental requirements during the construction process and throughout the building life cycle. (Ministry of Housing and Urban Planning of the City, 2012).

The concern for the environment has become necessary and urgent, and is linked to local and international efforts to the issue of sustainability. In fact, the Algerian construction industry showed positive growth over the reporting period (2012-2016). The increase was funded by substantial investment in the five-year plan 2010-2014, when the government provided 20.7 DZD trillion to develop several projects and support education in the fields of transportation, housing, energy and other fields.

During the forecast period (2017-2021) the industry is expected to expand, though at a relatively slow pace It is estimated that the expansion of the industry during this period is mainly due to the government investment in the five-year investment plan under the project under construction from 2015 to 2019, and the government under it will invest 21.6 DZD trillion yuan (US $ 215.0 ten) Billion) Support until 2019, with emphasis on transportation, hospital infrastructure and water.

The relationship between construction and economic growth is multifaceted and complex (Narloch et al., 2018). Infrastructures not only directly influence production and consumption, but also directly influence many direct and indirect external factors (Thacker et al., 2019). It is also associated with a large outflow of expenses and creates additional employment opportunities. Several studies have shown that infrastructure can have a significant impact on production, income, employment, international trade, and quality of life (Myers, 2013). Expanding your infrastructure can reduce stress and promote health. It will

also reduce crime. Infrastructure has always played an important role in the integration of regional economies. Reliable and efficient infrastructure is essential for the socio-economic development and growth of the region. Through a dynamic approach, transport infrastructure is seen as a local public good that can alter national and national factors of production, thus helping the region to achieve higher productivity and faster growth (Palei, T et al., 2015). A good transportation system is also a tool for social interaction in relieving people's depression.

4. ALGERIA GDP FROM CONSTRUCTION INDUSTRY SECTOR

The average annual growth rate (CAGR) is 5.99% of the actual output value of the industry, and the expected average annual growth rate is 5.22% (Mekdad et al.,2014). The Algerian economy is one of the most important oil producers in Africa, so it relies heavily on oil export revenue. However, the sharp drop in crude oil prices in mid-2014 affected the country's economic performance. As prices remain low, the government aims to diversify the economy by reducing dependence on oil. During the planning period, this is expected to stimulate private and foreign investment in the country's non-oil sectors (including construction)

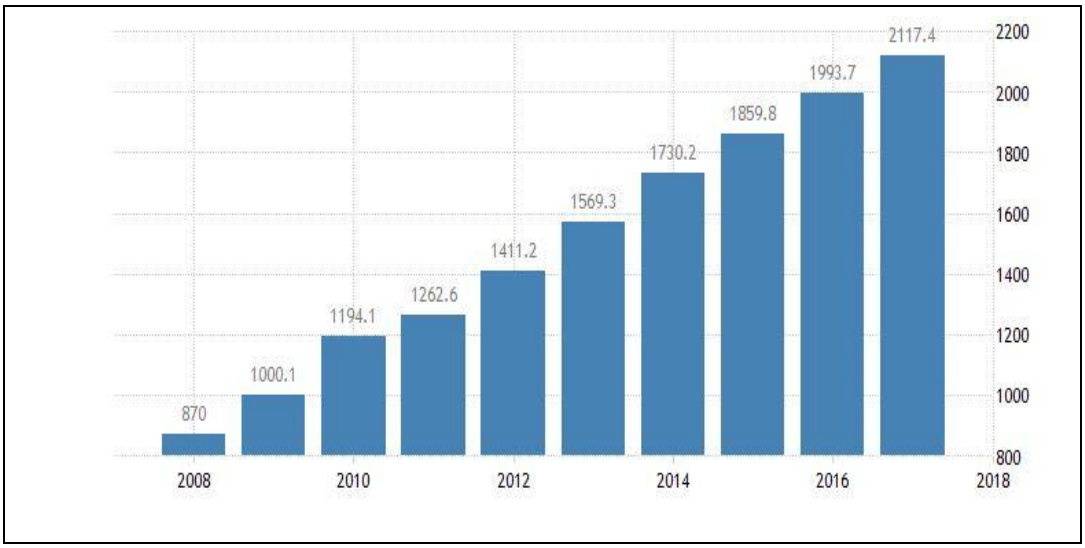

Figure 1 Gross Domestic Product of the economic sector in Algeria (2008-2018) (Trading Economics Algeria .2018).

The figure 1 illustrated that the GDP from Construction in Algeria increased to 2117.40 DZD Billion in 2017 from 1993.70 DZD Billion in 2016. GDP from Construction in Algeria averaged 1247.42 DZD Billion from 2008 until 2017, reaching an all-time high of 2117.40 DZD Billion in 2017 and a record low of 870 DZD Billion in 2008.

It is estimated that hydrocarbons account for about 60% of budget revenue, 30% of GDP and more than 95% of export revenue. Algeria has foreign currency reserves of USD 150 billion and a large stabilization fund. The government's rule over the economy, corruption and bureaucracy continues to hinder the further development and diversification of the economy. This section describes: Algeria's GDP growth rate: real value, historical data and conomic.

Algeria's GDP growth rate (actual data, historical charts and publication schedule) was last updated in November 2018 (Trading Economics Algeria .2018).

5. INCOMES OF CONSTRUCTION INDUSTRY

The construction industry is one of the industry's most dynamic and responsive industries. It also has a very significant production volume and stimulates significant economic growth through cross-sectoral links between buildings and other sectors (Giang D and Pheng L. 2011), which strengthens the construction industry. The construction industry has made an outstanding contribution to sustainable economic development and achieved some basic development goals, including the creation of production, job creation, income generation and redistribution (Schroeder et al., 2019). It also plays an important role in meeting basic material and social needs, including housing, infrastructure and consumer goods. Therefore, it is important to understand how the construction industry reacts to changes in other economic sectors. Previous studies have shown a positive correlation between construction output and economic growth, especially in developing countries (Personal & Archive, 2015). Therefore, it is important to understand the contribution of the construction industry to socio-economic development and economic growth.

The main purpose of the construction is to provide the physical infrastructure. Providing infrastructure can help solve four issues: social networks, health and the environment, development and the economy. Regional infrastructure networks are often social and economic environments created by institutions that are trading and investment channels. Some of these facilities are public facilities and other private facilities. In both cases, their roles are translated into an integrated context, helping to turn resources into results or to improve trade by removing obstacles. Therefore, the development of local infrastructure is one of the key elements for the long-term economic growth of the region.

As a key sector in the economic development of Algeria, growth in the construction sector remains positive, despite the impact of lower oil prices on the state budget. In 2016, Algeria imported more than $ 100 million of construction equipment from the United States. The sector contributed about 6% to the country's GDP in 2016 (Oxford Business Group, 2019).

In addition, Chowdhury *et al*., 2009 addressed that construction industry is statistically significant for economic development and is closely related to other industries. They also acknowledge that the construction industry is an important sector for economic growth and expansion in developing countries.

Figure 2 Asian Investment to Outpace the EU, UK and US (Nesshöver *et al*., 2017)

Figure 2 illustrates: Economics Oxford claimed that the development construction interest in Asia is expected to reach $1.61 trillion a year, versus a normal estimation of $697 billion in the US, and $890 billion in the EU (Nesshöver *et al*., 2017) Southeast Asian markets are among the world's quickest developing, and nations need to invest intensely in foundation, for example, transportation and utilities, to satisfy their long-term potential and keep up their development direction (Raymond *et al*., 2017; Nesshöver *et al*., 2017).

6. DEVELOPMENT OF CONSTRUCTION INDUSTRY

Algeria's leaders have identified a clear crystal path that has made Algeria is not only economically developed, but also in terms of social justice, political stability, government, quality of life, social and spiritual values, national pride, and trust. This vision is called the Algeria 2030 vision. The main objective of this vision is to make Algeria a prosperous, competitive, dynamic, sustainable and sustainable country by 2030. In this respect, the dynamism of the construction sector can play an important and effective role and enhance its direct and feedback links with other sectors of the economy. This sector provides socio-economic infrastructures for industrial growth and production as well as basic facilities such as residential and commercial buildings, parks, playgrounds and stadiums, medical facilities, roads, highways, railways, ports and airports. Algeria recognized the importance of the construction industry in the early days of independence and began to develop this sector.

The construction industry contributed to the development of other industries because of its role as a major component of the country's socio-economic development. Educational institutions, government agencies, some tourist attractions, transport infrastructure (airports, seaports, roads), housing and commercial real estate are all important elements of a healthy, well-functioning economy that must be built and supported by the construction industry. In addition, to promote socio-economic development, construction has created tremendous opportunities for secondary effects. It serves as a professional tool and as a major user of finished products (building materials, iron, steel, etc.) in the heavy engineering and financial services sectors and contributes to the development of other industries.

Few studies have examined the causal link between economic growth and construction investment in developing countries, and provided mixed empirical results for determining causality. In particular, some studies have shown that the construction industry is influencing economic growth, as it maintains close links with other sectors of the economy. That is, housing growth is often linked to the increase in the employment and income sectors, as well as the provision of goods and housing services. according to (Personal & Archive. (2015); Lean, C. S. (2002.); Khan, (2008)). (Personal & Archive, 2015) Using data from 1968 to 2004, a causal relationship between growth in the construction industry and macroeconomic growth in Ghana, and growth in the construction industry.

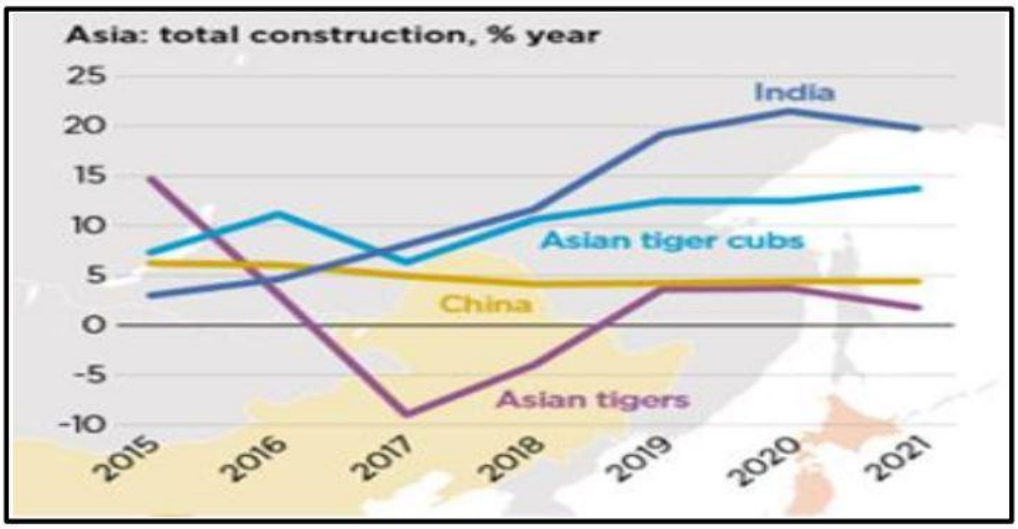

Figure 3 Expectation of Construction Growth Across the Word Until 2021
(Nesshöver *et al*., 2017).

7. SUSTAINABLE DEVELOPMENT

In business, sustainability refers to the momentum that arises when a company develops the value of permanent shareholders and stakeholders. A key aspect of sustainable value is that companies serving society and the environment serve clients and shareholders better, not without them (Hassan et al., 2016). Sustainable development helps to extend the life of the company, to strengthen the planet's content, to update the biosphere, to feed living beings protect and improve society (França., 2017). The ability to preserve the present and the future, solve problems, preserve the stability of well-being, human participation and personal freedom.

Sustainability requires companies to consider the social and environmental impact of their activities and daily activities (Dyllick et al., 2016). The central theme of sustainability is the confrontation between the growing needs of the population and the degradation of resources and the environment on Earth (Gómez & Naredo., 2015). Sustainability requires companies to consider the social and environmental impact of their activities and daily activities.

The Algerian government is investing heavily in sustainable development and research, as well as new laws for sustainable housing., reducing CO2 emissions (Bouznit & Pablo et al.,

2016). Shows the interest of the Algerian state to promote sustainable development other the legislative side, the national scientific research encourages researchers to engage in research that is the case of PNR projects and achieving the pilot projects, the organization of international meeting to develop new concepts (Trirat *et al* ,. 2017).

7.1 Principles of Sustainable Construction

Sustainable development is a dynamic concept. This implies that decision makers are flexible and ready to change their approach. In order to achieve sustainable development, the basic principles of sustainability must be balanced, namely environmental, economic and social aspects. (Hassan et al ,, 2016).

a) ***Environment Aspect***

In environmental dimension the sustainable approaches are as follow:

Increase material efficiency by reducing the material demand of non-renewable goods, reduce the material intensity via substitution technologies, enhance material recyclability, reduce and control the use and dispersion of toxic materials, reduce the energy required for transforming goods and supplying services, support the instruments of international conventions and agreements, maximize the sustainable use of biological and renewable resources and Consider the impact of planned projects on air, soil, water, flora, and fauna.

b) ***Economic Aspect***

as in economic dimension the sustainable approaches are follow:

Consider life-cycle costs, internalize external costs, consider alternative financing mechanisms, develop appropriate economic instruments to promote sustainable consumption and consider the economic impact on local structures.

c) ***Social Aspect***

In social dimension the sustainable approaches are as follow:

Enhance a participatory approach by involving stakeholders, promote public participation, promote the development of appropriate institutional frameworks, consider the influence on the existing social framework and assess the impact on health and the quality of life.

8. SUPPLY CHAIN MANAGEMENT

The term supply chain or logistics network is defined as a system of organization, personnel, technology, activities, information and resources, and these products or services include suppliers from customers. Other definitions of the supply chain are defined as a network of organizations involved in various processes and activities that create value in the form of products and services in the hands of end users through up and down (Mohd Nawi & Lee, 2016).

Procurement plays a key role in the beginning of the value chain and entry activities to determine the degree of high degree of adoption of environmental impact and environmental procurement among enterprises. In this study, environmental procurement was selected as one of the sustainable supply chain management practices. Choose sustainable packaging as the next sustainable supply chain management practices (Ojo, Mbohwa, & Akinlabi, 2015).

The level of success is the most often missing piece of sustainable development. This level is the other level and level of the system (in this case, non-sustainable building practices that affect the biosphere), as well as strategic guidelines and levels of action (the construction industry takes a step-by-step approach to sustainable practices) need to provide information in (development). The current strategies employed by the industry are usually the result of problems occurring at the system level. However, other levels are not taken into account so you need to come up with a different problem to fix it. Therefore, the principle of success rate sustainability helps to identify the underlying problem (Zhu et al., 2017). Chin et al. (2015) provides detailed information on supply chain management by explaining the operational model of the supply chain. The model consists of four parts: planning, purchasing, manufacturing and shipping. The model shown in Figure 4 highlights the characteristics and actions of each category.

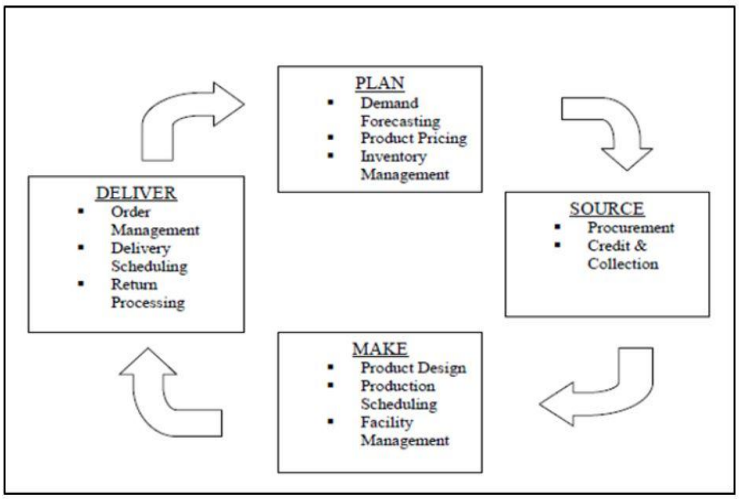

Figure 4 Supply chain operations model. Source: (Chin *et al* ,.2015).

A. Plan

product and producer availability, delivery times that can be produced, demand conditions that indicate the direction of demand for a product, whether it is decreasing or increasing. Study product characteristics by examining product characteristics. The competitive environment that describes the products that affect their demand and, ultimately, the competition for the company's job and market share.(Chin et al., 2015).

B. Source

A study by (Luthra *et al*,. 2014) stated that the source part involve procurement and credit and collection services. The main goal of the procurement business is to purchase and purchase products or materials at the lowest price possible. The purchasing function consists of five major activities. Purchasing, customer management, supplier selection, contract negotiation and contract management. Procurement activities include the procurement of direct or strategic materials needed to manufacture the final product, or Maintenance, Repair and Operation (MRO) products that are usually used as part of daily operations. (Seuring & Müller, 2008).

Consumer management is an activity that manages the consumption of enterprise products and monitors the expected level of consumption. When consumption is significantly higher or lower than expected, relevant parties should be notified to identify possible causes and take corrective action (Luthra *et al*,. 2014). Supplier selection activity is to reduce the number of suppliers to an acceptable number so that companies can pass a few Reliable suppliers use their purchasing power to obtain better prices in exchange for higher products (Ruiz-Benitez *et al* ,. 2018).Contract negotiations are based on specific projects, prices and service levels negotiate contracts, and with each supplier last, once the contract formal Agreed and signed, the supplier's performance will be monitored and measured according to their individual contract. This is the necessity of contract management activities. All these contracts need to be managed and monitored, and any shortcomings and corrective actions are required (Luthra *et al*,. 2014).

C. Make

Components include product design, production planning and equipment management. Supply chain concept products are products designed with fewer parts, simpler design and modular structure, using common sub-components. Technical availability and product performance requirements are factors to consider when designing components (specifications) and selection. Product design defines the shape of the supply chain that has a significant impact on product costs and availability. All decisions regarding object management are limited by decisions regarding the position of the object. Therefore, current site administrators will monitor the location and focus on how best to use the available capacity. This includes the role each property plays, how it is allocated, and a definition of the supplier and market share for each property (Luthra et al., 2014).

D. Delivery

The delivery part consists of three operations, two of which are considered to be key links between trading partners in the supply chain. Order management includes receiving orders and delivery plans from customers, and delivering products to customers. Order management involves communicating order information to suppliers in the supply chain. These include order processing, forwarding delivery time, product exchange, and delivery of orders to

customers in the supply chain. Order processing includes order processing, invoicing and invoicing (Lorber et al., 2015).

Delivery schedules are usually limited to delivery methods, and two delivery methods are applicable: direct delivery and operational delivery. Delivery from an originating location to a receiving location is called direct delivery. The main concern when scheduling in this way is to obtain te shortest path between two locations (Luthra *et al*,. 2014).

8.1 Sustainable Supply Chain Management (SSCM)

Sustainable supply chain management refers to the integration of sustainable development and supply chain management. Sustainable development usually encompasses three dimensions: the combination of environmental, social and economic dimensions with human development, which also affects business strategy and behavior. While the scope of SSCM is considered new, interest in SSCM has grown rapidly in recent years (Zailani et al., 2012). (Laari et al., 2017) Through the systematic coordination of key inter-organizational business processes to improve long-term economic performance, SSCM is recognized as a transparent integration and achievement of social, environmental and economic goals.

8.2 Importance of Green Supply Chain Management in Construction Industry

Afforestation in the supply chain can bring important social and economic benefits that go far beyond construction and help to achieve broader development goals (Ojo et al., 2015). The SBCI of the United Nations Environment Program previously reported that the construction industry usually provides 5–10% of jobs at the national level, usually within a country, as a rule 5-15% of GDP (UNEP-SBCI, 2009). The construction, use and refurbishment of buildings brings many social and economic benefits by 2025. Global construction is projected to reach $ 15 trillion annually (Global Construction, 2013).

There are many reasons why companies go green in the supply chain. Some research shows that some companies are going green because they think this is the right thing to do for the environment (Wu *et al*, 2012). Raising profitability and reducing costs are some of the motives behind green development (Laari et al., 2017). Considering that reverse logistics is mainly driven by economic factors rather than protecting ecosystems**.** The construction supply chain management adopts a new method to reduce construction costs and improve application reliability and speed design (Zhu *et al*,. 2012).

The applying green supply chain management in Algerian construction industry will result at three dimensions which are, environmentally by improving the practice of the environment internally while using the identification of regulating and legal requirements necessary of the ISO14001 norm and improve companies to minimize and reduce pollution, cost of wastes and cost of reduction. According to Tabit et al (2017) four types of environmental approaches that will be distinguished by using the environment management practices are ritual, reactive, dynamic and proactive.

Economically, In contrast, recent studies have examined the positive relationship between GSCM practices and economic performance (Kuei et al., 2013; Lai et al., 2012). The GSCM concepts can be integrated throughout the project life cycle from the initiation phase to the operation and maintenance phase and reducing waste, energy used (Naniek et al., 2018)**.** The

high contribution of the construction industry has unquestionably influenced the gross domestic product economically (Shah *et al* ,. 2017)**.**

GSCM will benefited the construction industry in social by improve equal employment opportunities, improve contribution to community capacity building, and reduce impact on heritage (Campagna *et al*,. 2015)**.**

9. GREEN SUPPLY CHAIN MANAGEMENT IN ALGERIAN CONSTRUCTION INDUSTRY

According to a study conducted by Mostafa B and Omar B in 2012, managing a green supply chain at each stage of the planning process requires managers to make the best decision from a wide range of choices. However, this is done to properly manage logistics, including all types of materials, both internal and external, inside or outside the company

GSCM activities can be attributed to top management support, organizational environmental policy, investment recovery and green ecological design, while the letter is more adapted to green procurement, reverse logistics and customer relationships to meet green needs, conduct research and development cooperation with stakeholders and evaluate and select suppliers. Basically, in order to achieve better environmental sustainability and performance, the three major GSCM basic practices must be implemented (Hassan *et al*. 2016).

10. CONCLUSION

Green supply chain is seen as a necessary condition for expanding the supply of green buildings, which are being realized on a commercial and broad basis. In the broader socio-economic context, the green building supply chain may provide many environmental, social and economic opportunities that go far beyond the green building itself. A more resource-efficient approach, a shift in materials and technology can bring competitive advantage and bring new economies of scale and economies of scale to the company and the region (European Commission). Necessary new skills and organizational change (UNEP, 2008) can create new jobs, promote economic growth and promote a green, low carbon economy. The introduction of sustainable supply chain management in the construction sector allows not only to reduce the consumption of natural resources in construction works, but also effectively reduce the environmental damage caused by the entire construction process.

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