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LOGISTICS AND SUSTAINABILITY
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INTRODUCTION

What is corporate sustainability? What is the relation between environment and company? What is environment organization? How a company affects to environment? Internal and external environment.

What is logistics? Is it important for a company? What is supply chain? And supply chain management? Which policies and principles must follow the managers to improve their supply chain management? How they can benefit from it?

What is green supply chain? Is it important for the society? And for the company? What the company win?

All these questions are answered in this report. Follow by an example of a company and its Green Supply Chain.
CORPORATE SUSTAINABILITY

Corporate sustainability is imperative for business today, essential to long-term corporate success and for ensuring that markets deliver value across society. To be sustainable, companies must operate responsibly in alignment with universal principles and take actions that support the society around them. Then, to push sustainability deep into the corporate DNA, companies must commit at the highest level, report annually on their efforts, and engage locally where they have a presence. (United Nations Global Compact, 2015)

Evolution of Corporate sustainability

The origin of the Corporate Sustainability concept is linked to the Brundtland’s report, World Commission for environmental and development, the first document that introduced the “sustainable development” concept. According to it, businesses are said to have a crucial role in managing impacts of population in ecosystems, ecosystem resources, food security, and sustainable economies to decrease the pressure society places on the environment. (Brundtland, 1987) (Delgado-Ceballos, 2014)

While corporate sustainability recognizes that corporate growth and profitability are important, it also requires the corporation to pursue societal goals, specifically those relating to sustainable development, environmental protection, social justice and equity, and economic development. (Wilson, 2003) (Delgado-Ceballos, 2014)

Throughout the years several definitions of corporate sustainable development have been used:

- Corporate sustainable development: based on three principles: economic prosperity; social equity; and environmental integrity. Bansal (2005) (Delgado-Ceballos, 2014)

- Corporate sustainability: refers to the 1987 Brundtland’s definition: the development that meets the needs of the present without compromising the ability for future generations to meet their own needs. Sharma and Henriques (2005) (Delgado-Ceballos, 2014)

- Sustainability: building a society in which a proper balance is created between economic, social, and ecological aims. For businesses, this involves sustaining and expanding economic growth, shareholder value, prestige, corporate reputation, customer relationships, and the quality of products and services. It also means adopting and pursuing ethical business practices, creating sustainable jobs, building value for all the company’s stakeholders, and attending to the needs of the underserved. Szekely and Knirsch (2005) (Delgado-Ceballos, 2014)
• Corporate sustainability: the ability of a firm to nurture and support growth over time by effectively meeting the expectations of diverse stakeholders. Neubaum and Zahra (2006) (Delgado-Ceballos, 2014)

• Sustainable organization: one whose characteristics and actions are designed to lead a “desirable future state” for all stakeholders. Funk (2003) (Delgado-Ceballos, 2014)

• Sustainable enterprise: contributes to sustainable development by delivering simultaneously economic, social, and environmental benefits. Sustainable development is the process of achieving human development in an inclusive, connected, equitable, prudent and secure manner. Hart and Milstein (2003) (Delgado-Ceballos, 2014)

According to Hart and Dowell (2011), sustainable development strategy “does not merely seek to do less environmental damage but to actually produce in a way that can be maintained indefinitely into the future”. (Delgado-Ceballos, 2014)

Sustainable development is not restricted to environmental concerns but also involves focusing on economic and social concerns. Since economic activity in developed countries is intimately connected with issues of poverty and degradation in less-developed countries, a strategy that considers sustainable development must recognize this link and act to reduce the environmental burden and increase the economic benefits for the lesser developed markets affected by the firm’s activities. (Hart & Dowell) (Delgado-Ceballos, 2014)

“Sustain centric” orientation of the firm, is described as a step toward a proactive orientation to sustainability. Firms need to find ways to interconnect social, economic, and ecological systems using “coordinated approaches that harness the collective cognitive and operational capabilities of multiple local and global social, ecological, and economic stakeholders operating as unified network or system”. (Delgado-Ceballos, 2014)

Another definition identifies six different perspectives encompassing CS: regulatory compliance, incremental mitigation, value alignment, whole system design, business model innovation, and mission transformation (Markevich, 2009). The integration of insights from these six perspectives will help firms progressing toward sustainability. (Delgado-Ceballos, 2014)

The sustainable development components are:

(a) inclusiveness: environmental and human systems, near and far, present and future
(b) connectivity: world’s problems interconnected and interdependent
(c) equity: fair distribution of resources and property rights
(d) prudence: duties of care and prevention
(e) security: safety from chronic threats
(Delgado-Ceballos, 2014)

Furthermore, Shrivastava (1995) described that the way to achieve sustainability was through the integration of four mechanisms:

(a) total quality environmental management
(b) ecological sustainable competitive strategies
(c) technology for nature swaps
(d) corporate population impact control.
(Delgado-Ceballos, 2014)

In another attempt to adapt sustainable development into the business world, Bansal (2005) introduced “corporate sustainable development” as a tridimensional construct composed of:

(a) economic prosperity achieved through value creation
(b) social equity through corporate social responsibility
(c) environmental integrity through corporate environmental management.
(Delgado-Ceballos, 2014)

The united nations global compact is a voluntary initiative based on CEO commitments to implement universal sustainability principles and to take steps to support UN goals. (United Nations Global compact, s.f.)

Also, it is a call to companies to align strategies and operations with universal principles on human rights, labor, environment and anti-corruption, and take actions that advance societal goals.

It had published a document called “guide to corporate sustainability”. A primer on the five defining features of corporate sustainability and ten principles on human rights, labor, environment and anti-corruption. (United Nations Global Compact, 2015)

This guide lays out five defining features of corporate sustainability, which the Global Compact asks businesses to strive towards – looking at why each element is essential, how business can move forward and what the Global Compact is doing to help. (United Nations Global Compact, 2015)

1. Principled business. For any company seeking to be sustainable, it begins with operating with integrity – respecting fundamental responsibilities in the areas of human rights, labor, environment and anti-corruption. The Global Compact’s Ten Principles provide a universal language for corporate responsibility – understood and interpreted in 160 countries around the world by over 8,000 companies – and a framework to guide all businesses regardless of size, complexity or location. (United Nations Global Compact, 2015)
Respecting principles in business. Operations and supply chains is a baseline for corporate sustainability. Yet, principles are about far more than compliance. They provide common ground for partners, a moral code for employees, an accountability measure for critics. A growing number of companies are seeing beyond risk, finding real value in actively addressing social, environmental and governance issues. (United Nations Global Compact, 2015)

2. Strengthening society. Sustainable companies look beyond their own walls and take actions to support the societies around them. Poverty, conflict, an uneducated work-force, and resource scarcity, for example, are also strategic issues for business success and viability. With business activity, investments and supply chains reaching all corners of the earth, companies are choosing to be active stakeholders in societies for the long run, knowing that they cannot thrive when the world around them is deteriorating. (United Nations Global Compact, 2015)

Companies are aligning core business activities, philanthropy and advocacy campaigns with UN goals and issues. Collaboration is essential. Companies and stakeholders are coming together to provide a collective voice and share risks in tackling major challenges that no single player can overcome, such as corruption, climate change and discrimination. (United Nations Global Compact, 2015)

3. Leadership Commitment. Effecting change begins with the company’s leadership. A public commitment by the chief executive, with support from the Board of Directors, is required to participate in the Global Compact. Leadership must send a strong signal throughout the organization that sustainability counts, and all responsibilities are important. (United Nations Global Compact, 2015)

This means instigating action in key areas: Board ownership of the agenda; adjustments to policies and practices; alignment of government affairs; training and motivating employees; pushing sustainability into the supply chain; and disclosing efforts and outcomes. Leaders also recognize they cannot shift systems alone, working with others to shatter barriers and increase the odds of success. Sustainability requires a long-term vision and commitment to ongoing efforts, both to ensure progress and keep pace with a rapidly changing world. (United Nations Global Compact, 2015)

4. Reporting progress. Non-financial reporting expectations have evolved from a feel-good supplement to a strategic report showing measurable gains and losses. As a chief accountability measure, signatories to the Global Compact are required to produce an annual Communication on Progress (COP), typically included as part of their sustainability or annual report, providing the company’s stakeholders with an account of their efforts to operate responsibly and support society. (United Nations Global Compact, 2015)

A number of stakeholders are driving businesses to be more transparent – from investors and consumers, to citizens and civil society groups. A top priority is to find ways to better measure sustainability impacts, which will help to direct effective corporate strategies, inform community and stakeholder dialogues, and guide investor decision-making. (United Nations Global Compact, 2015)
5. Local action. While the Global Compact principles are universal, companies exist and act within nations and communities with highly varying expectations of what responsible business means. Additionally, the types of issues a company faces and how it can actively support local and national priorities ranges greatly. (United Nations Global Compact, 2015)

Corporate sustainability starts with a company’s value system and a principled approach to doing business. This means operating in ways that, at a minimum, meet fundamental responsibilities in the areas of human rights, labor, environment and anti-corruption. Responsible businesses enact the same values and principles wherever they have a presence, and know that good practices in one area do not offset harm in another. By incorporating the Global Compact principles into strategies, policies and procedures, and establishing a culture of integrity, companies are not only upholding their basic responsibilities to people and planet, but also setting the stage for long-term success. (United Nations Global Compact, 2015)

- The ten principles of the united nations global compact

  ➢ Human Rights

  1. Businesses should support and respect the protection of internationally proclaimed human rights; and
  2. Make sure that they are not complicit in human rights abuses.

  ➢ Labor

  3. Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
  4. The elimination of all forms of forced and compulsory labor;
  5. The effective abolition of child labor; and
  6. The elimination of discrimination in respect of employment and occupation.

  ➢ Environment

  7. Businesses should support a precautionary approach to environmental challenges;
  8. Undertake initiatives to promote greater environmental responsibility; and

➢ Anti-Corruption

10. Businesses should work against corruption in all its forms, including extortion and bribery.
ENVIRONMENT AND COMPANY

Environment is defined as the sum of all surroundings of a living organism, including natural forces and other living things, which provide conditions for development and growth as well as of danger and damage. (BusinessDictionary, s.f.)

Natural environment involves climate, weather, and natural resources that affect human survival and economic activity. (BusinessDictionary, s.f.)

What is an organizational environment?
The organization needs to properly understand the environment for effective management. (SlideShare, s.f.)

In discussing environmental issues, the natural environment is the topic that frames the debate. And the interaction between these two elements—natural environment and organizational environment—as well as between each of them and various constituencies makes research complex. (Etzion, 2007)

The environment with which a firm interacts is an organizational environment, in which their constituent positions reflect their attitudes to the natural environment. (Goldman & Schurman, 2000). (Etzion, 2007)

The factors controlling organizational environment are classified into external and internal factors. (SlideShare, s.f.)

Internal environment is composed of the elements within the organization, including current employees, management, and especially corporate culture, which defines employee behavior; trade unions, management, shareholders, etc. (SlideShare, s.f.)

The external environment of an organization refers to the forces and institutions outside the organization that potentially affect its performance. It has two points: general environment and task environment. (SlideShare, s.f.)

General environment: The general environment refers to the non-specific elements of an organization’s surrounding that might affect the organization indirectly. These external forces are: (SlideShare, s.f.)

• Political or legal environment. It refers to the government laws, regulations, policies and activities which are designed to influence organizations indirectly and set boundaries on what they can or cannot do. (SlideShare, s.f.)

• Economic environment. It includes the impact of economic factors like interest rates, inflation, monetary & fiscal policy, taxes, wage rates, GDP, etc. These forces are most likely to affect an organization’s production of goods and services. (SlideShare, s.f.)

• Technological environment. It refers to the changes in technology that affect the way that organizations operate and the services they provide. (SlideShare, s.f.)
• Socio-cultural environment: There are some important socio-cultural factors that organizations must analyze. These factors play a significant role because they determine the kind of goods, services and standards that society values. The socio-cultural force includes the demographics and values of the customer base. The demographics and values considered are: Age, Population density, Education levels, Geographical distribution, Culture, Lifestyle. (SlideShare, s.f.)

Task environment: The task environment is inclusive of those outside sectors that have a direct working relationship with an organization. The main variables in the task environment are: (SlideShare, s.f.)

• Owners. Owners expect managers to watch over their interests and provide a return on investments. (SlideShare, s.f.)

• Customers. Customers are the final purchasers of a good or service, or absorbs the organizational output. Studies or analyses of the expectations of the targeted customer base helps organizations deliver. (SlideShare, s.f.)

• Suppliers. Suppliers are the people or organizations who provide the raw material that an organization use to produce their output. A supplier’s pricing strategy affects the revenue the organization earns. (SlideShare, s.f.)

• Labor. Labor market includes the people available for hire. Qualities, skills and knowledge possessed by the employees affect the performance of an organization. (SlideShare, s.f.)

• Competition. Competitors present challenges as they offer customers in a marketplace equivalent products or services. The management of an organization should be prepared to respond to the competitor policies. (SlideShare, s.f.)

The norms, beliefs, and actions in the organizational environment are heavily influenced by the way actors—both within the organization and external to it—perceive and understand the natural environment and their relation to it (Starkey & Crane, 2003). (Etzion, 2007)

The experts often perceive and evaluate the same facts differently because their relevant knowledge, perceptions, and “social environments” are different (Vastag, Kerekes, & Rondinelli, 1996). (Etzion, 2007)

Moreover, external audiences are influenced to a great degree by “task visibility,” that is by the sensory impact resulting from a firm’s action on the natural environment (Jiang & Bansal, 2003). (Etzion, 2007)

Task visibility is in turn moderated by “impact opacity,” or the difficulty for outsiders to understand and measure the extent of the impact (Jiang & Bansal, 2003). (Etzion, 2007)

Similarly, many communities and stakeholders are becoming increasingly well organized (Hoffman & Ventresca, 2002) and influential. Many organizations find it difficult to accurately measure the importance of the competing claimants,
their level of influence, and the interrelation between the various actors (Banerjee, 2001). (Etzion, 2007)

The result is that a firm's environmental performance can generate a very wide array of responses ranging from admiration, through apathy, to condemnation, depending on the specific activities it is engaged in and the level and source of attention that it attracts. (Etzion, 2007)

More important, businesses tend to view environmental issues through a different lens than many stakeholders. This can lead to great difficulty in establishing viable channels of communication and developing mutual understanding between firms and external constituencies. (Etzion, 2007)

In sum, on the issue of the natural environment, organizations face a very diverse set of stakeholders, with a broad and often conflicting set of knowledge, demands, and worldviews, some of which are far removed from financial and economic issues. (Etzion, 2007)

As discussed previously, the organizational environment, as it pertains to the natural environment, is composed of quite a few key actors: regulators, customers, the media, investors, activists, boards of directors, and of course the public at large. The degree of influence each type of actor wields varies according to the issue, the industry, and the setting. (Etzion, 2007)

the organizational environment itself is not constant, and firms play a role in constructing it. Firms may take a proactive approach not just toward improving environmental performance but also to influencing the institutional setting in which they operate. (United Nations Global Compact, 2015)

However, in the long term, it seems that only firms that demonstrate respect for fellow citizens and real commitment to the community obtain a legitimate decision-making role through civic engagement. (Etzion, 2007)

To ensure long-term viability, a corporation must proactively seek out those places where it can make a substantive commitment to the community and engage its stakeholders in authentic discourse, consequently committing itself and accepting the possibility of being transformed through such exposure (Saiia & Cyphert, 2003). (Etzion, 2007)

In the field of organizations and environment (O&E) research, there are two different important points: organizations and the natural environment. (BANSAL, 2006)

With the first, researchers see the natural environment as a crucial factor in determining organizational outcomes. With the second, researchers assume that the environment is an important outcome and are interested in how organizations interact with the natural environment. An assumption common to both approaches is that the natural environment and organizations are related to each other. However, there is also a deep-rooted difference. (BANSAL, 2006)

On the natural environment side, the natural environment is an important end. Due to it the purpose of industrial development is to improve human health, and its success depends on a healthy planet. Business and the natural environment are indistinguishably linked. Therefore, researchers direct their energy into
investigating environmental performance, either at the organizational level of analysis or at a more macro level. Their research findings are often targeted to government policy makers or even society, rather than primarily at business managers. (BANSAL, 2006)
LOGISTICS AND SUPPLY CHAIN MANAGEMENT

What is logistics?
There are different definitions by different authors trying to explain in what logistics consist:

The council of logistics management defined it as “the process that began with the production of a product since being deliver to its final consumer, and all the processes between that”. (Tseng, 2005)

Another definition by Johnson and Wood’s uses ‘five important key terms’:

- Logistics. Logistics describes the entire process of materials and products moving into, through, and out of a firm.
- Inbound logistics. Inbound logistics covers the movement of material received from suppliers.
- Materials management. Materials management describes the movement of materials and components within a firm.
- Physical distribution. Physical distribution refers to the movement of goods outward from the end of the assembly line to the customer.
- Supply-chain management. Supply-chain management is somewhat larger than logistics, and it links logistics more directly with the user’s total communications network and with the firm’s engineering staff. (Tseng, 2005)

One thing in common in the different definitions of logistics is that it is a process of moving and handling goods and materials, from the beginning to the end of the production, sale process and waste disposal, to satisfy customers and add business competitiveness. (Tseng, 2005)

There are three components of the logistics system: logistics information systems, logistics services and logistics infrastructure and resources. (Tseng, 2005)

Logistics services support the movement of materials and products from inputs through production to consumers, as well as associated waste disposal and reverse flows. They include activities undertaken in-house by the users of the services (e.g. storage or inventory control at a manufacturer’s plant) and the operations of external service providers. Logistics services comprise physical activities (e.g. transport, storage) as well as non-physical activities (e.g. supply chain design, selection of contractors, freighage negotiations). Most activities of logistics services are bi-direction. (Tseng, 2005)

Information systems include modelling and management of decision making, and more principal issues are tracking and tracing. It provides essential data and consultation in each step of the interaction among logistics services and the target stations. (Tseng, 2005)
Infrastructure comprises human resources, financial resources, packaging materials, warehouses, transport and communications. Most fixed capital is for building those infrastructures. They are concrete foundations and basements within logistics systems. (Tseng, 2005)

Logistics Evolution

The main background of logistics development is the recession of America in the 1950s that caused the industrial to place importance on goods circulations. The term, logistics, was initially developed in the context of military activities in the late 18th and early 19th centuries and it launched from the military logistics of World War II. (Tseng, 2005)

The probable origin of the term is the Greek logistikos, meaning ‘skilled in calculating’. (BTRE, 2001) Military definitions typically incorporate the supply, movement and quartering of troops in a set. And then, several researches were taken and made logistics applications from military activities to business activities. (Tseng, 2005)

Before the 1950s, logistics was under an undeveloped condition. Production was the main part of the managers concerned. During the 1950s and 1960s, applying innovative ideas of administration on business was a tendency. Business logistics was not an academic subject until the 1960s. (Tseng, 2005)

Lewis’s study (cited in Chang, 1998) in 1956 on the role of air transportation in physical distribution was the application of “total cost concept” and it pointed out the notions of trade-off between inventory and transportation. And one of the key element of logistics, the trade-off between transport and inventory costs, was not formally recognized in economics until the mid-1880s. (Tseng, 2005)

From the 1970s onwards, more and more applications and researches of logistics appeared. Due to petroleum price rise in 1973, the effects of logistics activities on enterprises grew. Slow growth of market, pressure of high stagflation, release of transportation control, and competitions of the third world on products and materials all increased the significance of logistics system on planning and business at that time. (Tseng, 2005)

The further tendency of logistics in the early 21st century is logistics alliance, Third Party Logistics (TPL) and globalized logistics. Logistics circulation is an essential of business activities and sustaining competitiveness, however, to conduct and manage a large company is cost consuming and not economic.
Therefore, alliance of international industries could save working costs and cooperation with TPL could specialize in logistics area. (Tseng, 2005)

**SUPPLY CHAIN MANAGEMENT**

Interest in logistics and supply chain management, both in industry and in academia, has grown rapidly over the past several years. A number of forces have contributed to this trend. First, it has become clear that many companies have reduced manufacturing costs as much as practically possible. Many of these companies are discovering the magnitude of savings that can be achieved by planning and managing their supply chain more effectively. (David Simchi-Levi, 2005)

**Table 1**
Definitions of supply chain management

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<tr>
<td>Monczka, Trent, and Handfield (1998)</td>
<td>SCM requires, traditionally separate materials functions to report to an executive responsible for coordinating the entire materials process, and requires joint relationships with suppliers across multiple tiers. SCM is a concept, “whose primary objective is to integrate and manage the sourcing, flow, and control of materials using a total systems perspective across multiple functions and multiple tiers of suppliers.”</td>
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<td>La Londe and Masters (1994)</td>
<td>Supply chain strategy includes: “... two or more firms in a supply chain entering into a long-term agreement; ... the development of trust and commitment to the relationship; ... the integration of logistics activities involving the sharing of demand and sales data; ... the potential for a shift in the locus of control of the logistics process.”</td>
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<td>Stevens (1989)</td>
<td>“The objective of managing the supply chain is to synchronize the requirements of the customer with the flow of materials from suppliers in order to effect a balance between what are often seen as conflicting goals of high customer service, low inventory management, and low unit cost.”</td>
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<td>Houlihan (1988)</td>
<td>Differences between supply chain management and classical materials and manufacturing control: “1) The supply chain is viewed as a single process. Responsibility for the various segments in the chain is not fragmented and relegated to functional areas.”</td>
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such as manufacturing, purchasing, distribution, and sales.

2) Supply chain management calls for, and in the end, depends on, strategic decision making. “Supply” is a shared objective of practically every function in the chain and is of strategic significance because of its impact on overall costs and market share.

3) Supply chain management calls for a different perspective on inventories which are used as a balancing mechanism of last, not first, resort.

4) A new approach to systems is required—integration rather than interfacing.”

<table>
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<th>Jones and Riley (1985)</th>
<th>“Supply chain management deals with the total flow of materials from suppliers through end users...”</th>
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<td>Cooper et al. (1997)</td>
<td>Supply chain management is “... an integrative philosophy to manage the total flow of a distribution channel from supplier to the ultimate user.”</td>
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Supply Chain Management as a Management Philosophy

As a philosophy, supply chain management takes a systems approach to viewing the supply chain as a single entity, rather than as a set of fragmented parts, each performing its own function (Ellram and Cooper 1990; Houlihan 1988; Tyndall et al. 1998). (Management, s.f.)

In other words, the philosophy of supply chain management extends the concept of partnerships into a multi firm effort to manage the total flow of goods from the supplier to the ultimate customer (Ellram 1990; Jones and Riley 1985). (Management, s.f.)

Thus, supply chain management is a set of beliefs that each firm in the supply chain directly and indirectly affects the performance of all the other supply chain members, as well as ultimate, overall supply chain performance (Cooper et al. 1997). (Management, s.f.)

As a management philosophy supply chain management pursues synchronization and convergence of intrafirm and interfirm operational and strategic capabilities into a unified, compelling marketplace force (Ross 1998). (Management, s.f.)

As an integrative philosophy, it directs supply chain members to focus on developing innovative solutions to create unique, individualized sources of customer value. (Management, s.f.)

Langley and Holcomb (1992) suggest that the objective of supply chain management should be the synchronization of all supply chain activities to create customer value. Thus, its philosophy suggests the boundaries of supply
chain management include not only logistics but also all other functions within a firm and within a supply chain to create customer value and satisfaction. In this context, understanding customers’ values and requirements is essential (Ellram and Cooper 1990; Tyndall et al. 1998). (Management, s.f.)

In other words, SCM philosophy drives supply chain members to have a customer orientation. (Management, s.f.)

Based upon the literature review, it is proposed that supply chain as a management philosophy has the following characteristics:

1. A systems approach to viewing the supply chain as a whole, and to managing the total flow of goods inventory from the supplier to the ultimate customer;
2. A strategic orientation toward cooperative efforts to synchronize and converge intrafirm and interfirm operational and strategic capabilities into a unified whole; and
3. A customer focus to create unique and individualized sources of customer value, leading to customer satisfaction.

(Management, s.f.)

Following the same idea previously discussed one of the most important article in the history of Supply Chain Management literature Review, appeared in 1997 and written by experts from the respected Logistics practice of Andersen Consulting (now Accenture), “The Seven Principles of Supply Chain Management,” laid out a clear and compelling case for excellence in supply chain management. The following insights provided remain remarkably valid years later. (David L. Anderson)

In the article, it is described how many managers have discovered that they can achieve profitable growth by treating supply chain management as a strategic variable. They recognize two important things. First, they think about the supply chain as a whole—all the links involved in managing the flow of products, services, and information from their suppliers’ suppliers to their customers’ customers (that is, channel customers, such as distributors and retailers). Second, they pursue tangible outcomes—focused on revenue growth, asset utilization, and cost. (David L. Anderson)

They realize that the real measure of success is how well activities coordinate across the supply chain to create value for customers, while increasing the profitability of every link in the chain. They also reflect a holistic approach, viewing the supply chain from end to end and orchestrating efforts so that the whole improvement achieved—in revenue, costs, and asset utilization—is greater than the sum of its parts. (David L. Anderson)

Then in the article it is defined the seven fundamental principles of supply chain.

- **Principle 1**: Segment customers based on the service needs of distinct groups and adapt the supply chain to serve these segments profitably. (David L. Anderson)
Segmentation has traditionally grouped customers by industry, product, or trade channel and then taken a one-size fits-all approach to serving them, averaging costs and profitability within and across segments. But segmenting customers by their needs equips a company to develop a portfolio of services tailored to various segments. Surveys, interviews, and industry research have been the traditional tools for defining key segmentation criteria. (David L. Anderson)

Research also can establish the services valued by all customers versus those valued only by certain segments. Then the company should apply a disciplined, cross-functional process to develop a menu of supply chain programs and create segment-specific service packages that combine basic services for everyone with the services from the menu that will have the greatest appeal to particular segments. (David L. Anderson)

The goal is to find the degree of segmentation and variation needed to maximize profitability. Most companies have a significant untapped opportunity to better align their investment in a particular customer relationship with the return that customer generates. To do so, companies must analyze the profitability of segments, plus the costs and benefits of alternate service packages, to ensure a reasonable return on their investment and the most profitable allocation of resources. To strike and sustain the appropriate balance between service and profitability, most companies will need to set priorities—sequencing the rollout of tailored programs to capitalize on existing capabilities and maximize customer impact. (David L. Anderson)

- **Principle 2:** Customize the logistics network to the service requirements and profitability of customer segments. (David L. Anderson)

Companies have traditionally taken a monolithic approach to logistics network design in organizing their inventory, warehouse, and transportation activities to meet a single standard. For some, the logistics network has been designed to meet the average service requirements of all customers; for others, to satisfy the toughest requirements of a single customer segment. Neither approach can achieve superior asset utilization or accommodate the segment-specific logistics necessary for excellent supply chain management. (David L. Anderson)

Fundamentals changes in the mission, number, location, and ownership structure of warehouses are typically necessary. The network will require more robust logistics planning enabled by “real-time” decision support tools that can handle flow-through distribution and more time-sensitive approaches to managing transportation. (David L. Anderson)

- **Principle 3:** Listen to market signals and align demand planning accordingly across the supply chain, ensuring consistent forecasts and optimal resource allocation. (David L. Anderson)

Excellent supply chain management, in fact, calls for sales and operations S&OP that transcends company boundaries to involve every link of the supply chain (from the supplier’s supplier to the customer’s customer) in developing forecasts collaboratively and then maintaining
the required capacity across the operations. Channel-wide S&OP can detect early warning signals of demand lurking in customer promotions, ordering patterns, and restocking algorithms and considers vendor and carrier capabilities, capacity, and constraints. (David L. Anderson)

- **Principle 4:** Differentiate product closer to the customer and speed conversion across the supply chain. (David L. Anderson)

Manufacturers have traditionally based production goals on projections of the demand for finished goods and have stockpiled inventory to offset forecasting errors. These manufacturers tend to view lead times in the system as fixed, with only a finite window of time in which to convert materials into products that meet customer requirements. (David L. Anderson)

While even such traditionalists can make progress in cutting costs through set-up reduction, cellular manufacturing, and just-in-time techniques, great potential remains in less traditional strategies such as mass customization. For example, manufacturers striving to meet individual customer needs efficiently through strategies such as mass customization are discovering the value of postponement. They are delaying product differentiation to the last possible moment. (David L. Anderson)

Realizing that time really is money, many manufacturers are questioning the conventional wisdom that lead times in the supply chain are fixed. They are strengthening their ability to react to market signals by compressing lead times along the supply chain, speeding the conversion from raw materials to finished products tailored to customer requirements. This approach enhances their flexibility to make product configuration decisions much closer to the moment demand occurs. (David L. Anderson)

The key to just-in-time product differentiation is to locate the leverage point in the manufacturing process where the product is unalterably configured to meet a single requirement and to assess options, such as postponement, modularized design, or modification of manufacturing processes, that can increase flexibility. (David L. Anderson)

- **Principle 5:** Manage sources of supply strategically to reduce the total cost of owning materials and services. (David L. Anderson)

While manufacturers should place high demands on suppliers, they should also realize that partners must share the goal of reducing costs across the supply chain in order to lower prices in the marketplace and enhance margins. The logical extension of this thinking is gain-sharing arrangements to reward everyone who contributes to the greater profitability. (David L. Anderson)

With their marketplace position and industry structure in mind, manufacturers can then consider how to approach suppliers—soliciting short term competitive bids, entering into long-term contracts and strategic supplier relationships, outsourcing, or integrating vertically.
Excellent supply chain management calls for creativity and flexibility. (David L. Anderson)

- **Principle 6:** Develop a supply chain-wide technology strategy that supports multiple levels of decision making and gives a clear view of the flow of products, services, and information. (David L. Anderson)

  For the short term, the system must be able to handle day-to-day transactions and electronic commerce across the supply chain and thus help align supply and demand by sharing information on orders and daily scheduling. From a mid-term perspective, the system must facilitate planning and decision making, supporting the demand and shipment planning and master production scheduling needed to allocate resources efficiently. To add long-term value, the system must enable strategic analysis by providing tools, such as an integrated network model, that synthesize data for use in high-level “what-if” scenario planning to help managers evaluate plants, distribution centers, suppliers, and third-party service alternatives. (David L. Anderson)

  Electronic connectivity creates opportunities to change the supply chain fundamentally—from slashing transaction costs through electronic handling of orders, invoices, and payments to shrinking inventories through vendor-managed inventory programs. (David L. Anderson)

- **Principle 7:** Adopt channel-spanning performance measures to measure collective success in reaching the end-user effectively and efficiently. (David L. Anderson)

  To answer the question, “How are we doing?” most companies look inward and apply any number of functionally oriented measures. But excellent supply chain managers take a broader view, adopting measures that apply to every link in the supply chain and include both service and financial metrics. (David L. Anderson)

  First, they measure service in terms of the perfect order—the order that arrives when promised, complete, priced and billed correctly, and undamaged. The perfect order not only spans the supply chain, as a progressive performance measurement should, but also view performance from the proper perspective, that of the customer. (David L. Anderson)

  Second, excellent supply chain managers determine their true profitability of service by identifying the actual costs and revenues of the activities required to serve an account, especially a key account.
Traditional accounting tends to mask the actual costs of the supply chain—focusing on cost type rather than the cost of activities and ignoring the degree of control anyone has over the cost drivers. (David L. Anderson)

Information and communication systems have been widely implemented, and provide access to comprehensive data from all components of the supply chain. (David Simchi-Levi, 2005)

In particular, the influence of the Internet and E-commerce on the economy in general, and business practice in particular, has been tremendous. Changes are happening extremely fast. For instance, the Direct-Business-Model employed by industry giants such as Dell Computers and Amazon.com, enables customers to order products over the Internet and thus allows companies to sell their products without relying on third party distributors or conventional stores. (David Simchi-Levi, 2005)

Deregulation of the transportation industry has led to the development of a variety of transportation modes and reduced transportation costs, while significantly increasing the complexity of logistics systems. (David Simchi-Levi, 2005)
GREEN SUPPLY CHAIN

The early literature of Green Supply Chain Management focuses on its necessity and importance. It defines the meaning and scope of various terms and suggests approaches to explore the area further. (Srivastava, 2007)

Fundamentals of greening as a competitive initiative are explained by Porter and van der Linde (1995a, b). Their basic reasoning is that investments in greening can be resource saving, waste eliminating and productivity improving. (Srivastava, 2007)

Three approaches in Green Supply Chain are suggested: reactive, proactive and value-seeking. (Kopicki et al. 1993; van Hoek 1999). (Srivastava, 2007)

In the reactive approach, companies commit minimal resources to environmental management, start labelling products that are recyclable and use ‘end of pipeline’ initiatives to lower the environmental impact of production. (Srivastava, 2007)

In the proactive approach, they started to pre-empt new environmental laws by realizing a modest resource commitment to initiate the recycling of products and designing green products. In the value-seeking approach, companies integrate environmental activities such as green purchasing and ISO implementation as strategic initiatives into their business strategy. (Srivastava, 2007)

Environmental issues have been increasingly integrated into international trade, and markets and consumers worldwide are increasingly demanding environmentally friendly products (Anbumozhi & Kanda, 2005). (Khidir Eltayeb, 2009)

The irresponsible environmental pollution resulting from the entire product life cycle—raw material acquisition, manufacturing, use and disposal—are the main reasons this global environmental carrying capacity is being exceeded (Matos & Hall, 2007). (Khidir Eltayeb, 2009)

These realities require immediate action by business, organizations, governments, and society to achieve a balanced growth that tries to achieve economic and social objectives without scarifying the environment. In this regard, businesses need to place equal footing both on the environment and on their business objectives. (Khidir Eltayeb, 2009)

Knowing that sustainable development is defined as “meeting the needs of the present generation without compromising the ability of future generations to meet their own needs” (WCED, 1987). (Khidir Eltayeb, 2009)

So, in addition to alleviating negative effect on the environment, integration of environmental aspects into business operations can generate significant economic benefits to business organizations. There is an increasing evidence that environmental improvement is good business (Porter & van der Linde, 1995). Industry or individual corporations are the single most important source of environmental problems. This is because human society depends heavily on industrial products to sustain its living standard. (Khidir Eltayeb, 2009)
Studies show that despite the existing efforts to alleviate environmental problems, they have not been mitigated; rather, they tend to have been aggravated (MGCC, 2006). In recent years, more effective approaches for environmental management have been proposed. These approaches shifted environmental management (EM) from just the end-of-pipe control and treatment of waste (Handfield et al., 2005; Sinding, 2000). (Khidir Eltayeb, 2009)

Firms should accept responsibility for environmental impacts which were once regarded as incidental externalities. Therefore, they must move from an environmental management paradigm that focuses on clean up and control to one that embraces avoidance of environmental harm through the entire product life cycle (Handfield et al., 2005). (Khidir Eltayeb, 2009)

Companies must know that treading this path requires more comprehensive means to reduce pollution through attacking the source of pollution at every stage of the product life cycle, that include raw material extraction, transportation, manufacturing, product use, recycling, and disposal (Matos & Hall, 2007) Corporate environmental strategies range from simple environmental impact assessment and waste minimization to more sophisticated eco-efficiency and green supply chain. (Khidir Eltayeb, 2009)

The steps taken by business organizations towards sustainability can be summarized as follows:

1. **Defensive compliance:** Firms can be reactive in environmental management and simply comply with existing regulations. Environmental issues were generally seen as a regulatory annoyance to be met only because noncompliance would result in severe financial penalties (Handfield et al., 1997). (Khidir Eltayeb, 2009)

2. **Waste minimization or cleaner production:** There are two central waste strategies that companies can adopt in their pursuit of waste minimization (Sinding 2000). (Khidir Eltayeb, 2009)

3. **Eco-efficiency:** World Business Council for Sustainable Development (WBCSD, 2006) define eco-efficiency in terms of delivery of competitively priced goods and services designed to satisfy human need and enhance quality of life, while progressively reducing environmental impacts and resource intensity throughout the life cycle to a level at least in line with the earth’s estimated carrying capacity. (Khidir Eltayeb, 2009)

4. **Design for environment:** DFE incorporates considerations of material’s recyclability and reusability, the materials’ long-term impact on the environment, the amount of energy required for the product’s manufacture and use, the capability for easy disassembly for remanufacturing, and considerations of the product’s durability and disposal characteristics (Sarkis, 1998). (Khidir Eltayeb, 2009)

5. **Green supply chain:** Green supply chain involves evaluating total environmental effects of products through its entire life cycle of products and services (Handfield et al., 2005). Extending green activities throughout the supply chain represents an evolution over environmental assessments focused
Literature Review on Green Supply Chain

The concept of green supply chain is a multidisciplinary issue that emerges mainly from performing environmental management practices in the context of supply chains (Sarkis, 2006; Walton, Handfield & Melnyk, 1998). (Khidir Eltayeb, 2009)

The environmental management represents specification of how organizations care about the natural environment and minimize the negative environmental effects of their entire operations (Klassen & McLaughlin, 1996; Welford, 2000). (Khidir Eltayeb, 2009)

They specify policies, procedures, and audit protocols for controlling operations that create waste materials or emissions (Matthews, 2003). (Khidir Eltayeb, 2009)

These principles usually take the form of standardized Environmental Management Systems (EMS) such as British Standard for EMS BS7750 (1994), the EU eco-management and audit scheme (1993), and the international standard ISO 14000 (Bansal & Clelland, 2004). These standards have been developed to provide organizations with a framework to implement EMS (Netherwood, 1996). (Khidir Eltayeb, 2009)

While environmental management principles and standards provide powerful tools that have a potential to generate significant improvements to environmental performance of organizations, their focus restricted only on creating and documenting environmental policies and procedures (Curkovic et al., 2005). (Khidir Eltayeb, 2009)

Such policies and procedures may represent efforts to improve environmental performance only within the organization’s operational boundaries rather than being extended throughout the supply chain (Bansal & Clelland, 2004; Handfield, et al., 2005). (Khidir Eltayeb, 2009)

Firms can market themselves as being environmentally proactive (by virtue of having an EMS) without undertaking the effort of “greening” their supply chains (Darnall, Jolley & Handfield, 2006). (Khidir Eltayeb, 2009)

Unlike the traditional environmental management, the concept of green supply chain assumes full responsibility of a firm towards its products from the extraction or acquisition of raw materials up to final use and disposal of products (Hart, 1997). (Khidir Eltayeb, 2009)

It represents the application of environmental management principles to the whole set of activities spanning the entire customer order cycle, including design, procurement, manufacturing and assembly, packaging, logistics, and distribution (Handfield et al 1997; Zsidisin & Siferd, 2001). (Khidir Eltayeb, 2009)

The green supply chain initiatives can be generally classified into the following categories: (1) Eco-design or design for the environment (2) Green purchasing (3) Reverse logistics (Khidir Eltayeb, 2009)
1. Eco-Design. Also called design for the environment and green design, refers to actions taken during product development aim at minimizing a product’s environmental impact during its whole life cycle - from acquiring materials, to manufacturing, use, and ultimately to its final disposal - without compromising other essential product criteria such as performance and cost (Johansson, 2002). (Khidir Eltayeb, 2009)

Eco-design is considered one of the green supply chain initiatives because it integrates environmental aspects into product design process, taking into consideration the entire flow of the product in its supply chain. (Khidir Eltayeb, 2009)

At the design stage, the function of the product, process or service is defined, and raw materials, supplies and process chemicals are selected. These in turn determine the energy which will be consumed to create them and the waste which will be generated. (WBCSD), 2007). (Khidir Eltayeb, 2009)

The basic eco-design activities include the following:

- Design for reduction or elimination of environmentally-hazardous materials such as lead, mercury, chromium and cadmium (Zsidisin & Siferd, 2001). (Khidir Eltayeb, 2009)

- Design for reuse, is a design that facilitates reuse of a product or part of it with no or minimal treatment of the used product (Sarkis, 1998). (Etzion, 2007) (Khidir Eltayeb, 2009)

- Design for recycling, is a design that facilitates disassembly of the waste product, separation of parts according to material, and reprocessing of the material (Lin, Jones & Hsieh, 2001). (Khidir Eltayeb, 2009)

- Design for remanufacturing, is a design that facilitates repair, rework, and refurbishment activities aiming at returning the product to the new or better than new condition (Beamon, 1999). (Khidir Eltayeb, 2009)

- Design for resource efficiency, including reduction of materials and energy consumption of a product during use, in addition to promoting the use of renewable resources and energy (APO, 2004). (Khidir Eltayeb, 2009)

2. Green Purchasing. It is an environmentally-conscious purchasing initiative that tries to ensure that the purchased products or materials meets environmental objectives set by the purchasing firm, such as reducing sources of waste, promoting recycling, reuse, resource reduction, and substitution of materials (Carter, Ellram & Ready, 1998; Min & Galle, 2001; Zsidisin & Siferd, 2001). (Khidir Eltayeb, 2009)
Green purchasing means that supply chain managers consider the issue of sustainability in their purchasing of inputs in addition to the traditional purchasing criteria of cost, quality, and delivery (Lambert & Cooper, 2000). (Khidir Eltayeb, 2009)

Hamner (2006) summarized the basic green purchasing activities in seven points as follows:

➢ Buyers specify that purchased products must have desirable green attributes such as recycled or reusable items.
➢ Buyers specify that purchased products must not contain environmentally undesirable attributes such as lead, CFCs, plastic foam in packaging materials.
➢ Buyers require disclosure of the environmental or safety attributes of purchased product content. Such disclosure can be done using green seals and indicators of relative environmental impact such as scientific certification system offered by various commercial organizations.
➢ Buyers send questionnaires to suppliers asking them to provide information about their environmental aspects, activities and/or management systems.
➢ Buyers require suppliers to develop and maintain an environmental management system (EMS).
➢ Buyers require suppliers to have an EMS that is certified as fully compliant with one of the recognized international standards such as the British Standard 7750 (BS 7750), ISO 14001 from the International Organization for Standardization (ISO), and the European Union Eco Management and Audit Scheme (EMAS).
➢ Buyers audit suppliers to determine their level of compliance with environmental requirements.

(Khidir Eltayeb, 2009)

3. Reverse Logistics. It focuses primarily on the return or take-back of products and materials from the point of consumption to the forward supply chain for recycling, reuse, remanufacture, repair, refurbishing, or safe disposal of the products and materials (Carter & Ellram, 1998; Stock 1998). (Khidir Eltayeb, 2009)

Reverse logistics enclose the traditional logistics activities of transportation and inventory management, but its focus is to get product back from customers rather than moving product to customers (Goldsby & Stank, 2000; Mollenkopf & Closs, 2005). (Khidir Eltayeb, 2009)

Used or end-of-life products returned into the forward supply chain for three main purposes (Beamon, 1999; Wells & Seitz, 2005) (Khidir Eltayeb, 2009):

1. Reuse, is the process of collecting used products from the field, and distributing or selling them used. Thus, although the ultimate value of the
product is reduced from its original value, no additional processing is required. (Khidir Eltayeb, 2009)

2. **Remanufacturing**, is the process of collecting a used product or component from the field, assessing its condition, and replacing worn, broken, or obsolete parts with new or refurbished parts. In this case, the identity and functionality of the original product is retained. (Khidir Eltayeb, 2009)

3. **Recycling**, is the process of collecting used products, disassembling them (when necessary), separating them into categories of like materials (e.g. specific plastic types, glass, etc.), and processing them into recycled products, components, and/or materials. In this case, the identity and functionality of the original materials is lost. (Khidir Eltayeb, 2009)

The firms with a Green Supply Chain can reduce the ecological impact of industrial activity without sacrificing quality, cost, reliability, performance or energy utilization efficiency. (Srivastava, 2007)

It involves a paradigm shift, going from end-of-pipe control to meet environmental regulations to the situation of not only minimizing ecological damage, but also leading to overall economic profit. (Srivastava, 2007)

The literature review of Green Supply Chain Management shows and ongoing integration process in Green Supply Chain Management. It is observed that the depth of research in various categories has been different. Many specific empirical studies have been carried out, and categories such as remanufacturing have been studied to a great depth. (Srivastava, 2007)

Even, that remanufacturing disassembly has been studied to a very detailed level. Other categories such as Reverse Logistics have started getting more attention. (Srivastava, 2007)

Research to date may be considered compartmentalized into content areas drawn from operations strategy. The primary areas of emphasis have been quality, operations strategy, supply-chain management, product and process technologies, which are collectively beginning to contribute to a more systematic knowledge base. (Srivastava, 2007)

It is reasonable to expect that these research areas will continue to hold the greatest promise for advance in the short term. However, more integrative contributions are needed in the longer term, including intra- and inter-firm diffusion of best practices, green technology transfer and environmental performance measurement. (Srivastava, 2007)

Much research, management education and many practical applications have focused on buffering the operations function from external influences, including the natural environment, to improve efficiencies, reduce cost and increase quality. (Srivastava, 2007)

When the natural environment is considered, it is typically recognized or modelled as an external constraint, requiring operations to work within prescribed limits. (Srivastava, 2007)

The inherent complexity of environmental issues – their multiple stakeholders, uncertain implications for competitiveness and international importance –
present significant challenges to researchers. Much research is needed to support the evolution in business practice towards greening along the entire supply chain. (Srivastava, 2007)

Artificial intelligence techniques, including knowledge-based systems, fuzzy systems and neural networks, are expected to play a significant role in research and development. Although many empirical studies (case studies, survey-based empirical methods, etc.) have been carried out, they have not dealt with every aspect. (Srivastava, 2007)

Improved Public Image

The more robustly green the supply chain becomes, the more it can become a public relations and marketing boon. Organizations let customers know that they're saving the planet x-number of tons of packaging material and y-number barrels of oil every year through their green supply chain initiatives. (Murray, 2017)

That's a metric that easily resonates with the public. And the cost reductions that pass on to the bottom line easily resonate with their chief financial officer, their board of directors, and their shareholders. (Murray, 2017)

Designing and implementing a greener supply chain is truly a win-win-win scenario for the company, its shareholders and its planet. When a supply chain becomes greener, waste is driven from it. When waste is driven from supply chain (or any process), the cost of that process is reduced. (Murray, 2017)

Profiting from Being Green

Some companies have seen consumer interest in the environment as a plus, and have even been able to convert the public's interest in all things green into increased profits. (Murray, 2017)

A number of companies have shown that there is a proof of the link between improved environmental performance and financial gains. Companies have looked to their supply chain and seen areas where improvements in the way they operate can produce profits. (Murray, 2017)

General Motors, for example, reduced disposal costs by $12 million by establishing a reusable container program with their suppliers. Perhaps General Motors may have been less interested in green issues if they were making record profits, but in an attempt to reduce costs in their supply chain, GM found that the cost reductions they identified complemented the company's commitment to the environment. (Murray, 2017)

Many Companies Are Unaware of Potential Cost Benefits

Companies can find cost savings by reducing the environmental impact of their business processes. By re-evaluating the company's supply chain, from purchasing, planning, and managing the use of materials to shipping and distributing final products, savings are often identified as a benefit of implementing green policies. (Murray, 2017)

Despite the public's focus on the environment, benefits attributed to reducing a company's environmental impact are not in the forefront of supply chain
executive’s minds. It appears that many executives are still unaware that improved environmental performance means lower waste-disposal and training costs, fewer environmental-permitting fees, and, often, reduced materials costs. (Murray, 2017)
A practice example: DHL and its green supply chain

DHL is a delivery company. It defines itself in its web page as a logistics partner big enough to deliver freight of any kind, to any place via air, ocean, road or rail, but capable of giving its customers the personal attention they need. (dhl España, 2017)

Warehousing and Distribution

By understanding the issues and anticipating the business and logistics needs, DHL experts provide robust solutions that will drive value for business. (dhl España, 2017)

Whatever industry sector the company operate in, DHL provides dedicated and shared warehousing and distribution operations to ensure that they can deliver their service promise to their customers worldwide. (dhl España, 2017)

DHL has developed a stablish policies to have a green supply chain and help its customers to have a green supply chain too. DHL present its initiatives, policies and activities to green solutions.

DHL GoGreen Solutions

Optimized transport routes, alternative drive vehicles and energy-efficient warehouses: There are many ways to reduce climate-damaging CO2 emissions and other environmental impacts in the transportation and storage of goods.

Working with our customers, we want to leverage this potential. At DHL, we call this GOGREEN We believe that environmental protection and business success are not just compatible, they are closely interlinked. Sustainability has long been a competitive factor: Consumers increasingly consider environmental aspects in their purchasing decisions. The same applies to investors who consult sustainability rankings when looking for viable investment options.

With our expertise and global presence, we can offer our business customers a broad portfolio of green products and services. By providing detailed Carbon Reports, we show them where they stand in terms of greenhouse gas emissions. In our Green Optimization service, we work with customers to identify areas for improvement, and ways to achieve a reduction of greenhouse gas emissions and improve their overall environmental performance. And to compensate for unavoidable emissions, we offer Climate Neutral services.

(dhl España, 2017)
On DHL’s web page, it is available a PDF document about its Green solutions. Following there will be the important points of the document.

DHL GREEN SERVICES decrease emissions. increase efficiency.

Carbon emissions are increasing, and the corporate world is demonstrating its leadership in meeting one of the greatest environmental and economic challenges of our time. (DHL, 2017)

SUSTAINABILITY INCORPORATED INTO BUSINESS STRATEGIES. It has become a board level topic to reduce the environmental impact from core business. (DHL, 2017)

INCREASED CARBON TRANSPARENCY AND DISCLOSURE. More companies disclosing their carbon emissions in their annual report or to external bodies. (DHL, 2017)

INCREASED POLLUTION CONTROL AND REGULATIONS. New regional and local legislation affecting companies and their supply chains. (DHL, 2017)

COST SAVINGS PRESSURE. Increased carbon efficiency measures across the supply chain, leading to optimized transport flows and capacity utilization – and ultimately, cost savings. (DHL, 2017)

It is in this context that a global service provider with the ability to deliver carbon transparency and reduction solutions offers you a genuine competitive advantage. (DHL, 2017)

DHL provide carbon transparency solutions to enable you to visualize and optimize the carbon emissions of your supply chain flows and reduce overall costs. (DHL, 2017)

INDUSTRY EXPERIENCE. We’re the pioneers in the development of green logistics solutions:

• Deep understanding of environmental requirements across different industries and sectors.
• Relationship with environmental authorities and standardizing bodies on global and regional levels.
• Solid carbon accounting governance model, audited by external parties.

• Progressing towards DHL’s own carbon efficiency target with great results (including subcontractors’ fleet).

(DHL, 2017)

CUTTING EDGE TECHNOLOGY. We provide state-of-the-art carbon optimization tools to help you improve your carbon footprint:

• User-friendly interface to online Carbon Dashboard, enabling focus on carbon efficiency modeling.

• Ability to integrate 3rd party transport providers data into DHL’s Carbon Dashboard.

• Web-based operating system allows global carbon emission visibility across the supply chain, per trade lane and transport mode.

• Collaboration with the Green Transformation Lab and Singapore Management University ensures that our technology constantly improves.

(DHL, 2017)

BROAD PORTFOLIO. Our broad range of DHL GREEN SERVICES ensures a one-stop solution to make your supply chain carbon efficient:

• We offer a suite of carbon transparency services compliant to latest carbon calculation standards.

• We calculate carbon emissions on shipment level in real time via our innovative Track & Trace application.

• Carbon efficiency KPIs are monitored and benchmarked to find optimization potential, in both cost and emissions.

• Portfolio constantly developing to adhere to changing legislation/standards, and to meet your expectations.

(DHL, 2017)

DHL GREEN SERVICES portfolio offers various levels of carbon transparency and helps to find improvement areas to optimize the carbon emission of supply chain and reduce environmental impact. No matter how big or small the company is, DHL can offer the right carbon transparency solution.

(DHL, 2017)
QUESTIONS ANSWERED

➢ What is carbon emission?

Carbon dioxide (CO2) emissions are the common type of gas emitted from the burning of fossil fuels. The higher the carbon content in the fossil fuel, or the more inefficient the burning process, generally, the greater amount of CO2 is produced. (DHL, 2017)

➢ Why should the companies reduce carbon emissions?

There are many drivers why a company should reduce their environmental impact and their carbon emissions. Legislative, customer or consumer requirements could be the driver but also reducing emissions can be part of a company actioning their corporate social responsibility. Also, by improving the overall carbon efficiency of supply chain, cost reduction opportunities can be identified. (DHL, 2017)

➢ Shouldn’t DPDHL also reduce CO2?

Absolutely. In 2007, Deutsche Post DHL announced the GoGreen climate protection program with the aim of becoming 30% more carbon efficient by 2020, including our own and our sub-contracted carbon emissions. To date, we have made significant progress, and we’re on track to reach our 2020 target – you can find the latest status on www.dpdhl.com (DHL, 2017)

➢ How does the DHL GoGreen program benefit me as a customer?

Since our improvement activities are based on our own fuel and energy consumption as well as our sub-contracted fleet (airlines, haulers and shipping lines) you, as a customer, also benefit from these efforts, since the shipments that you transport with DPDHL are also more carbon efficient. Also, our emission factors are updated yearly to reflect the latest changes. (DHL, 2017)

➢ How can the reduction of CO2 lead to cost optimization?

Reviewing the CO2 emissions in comparison to benchmark KPIs can indicate whether the supply chain is operating carbon efficiently or not. If a supply chain is not carbon efficient, it may also mean that it’s not cost efficient. For example, underutilized containers or pallets represent cost optimization potential. (DHL, 2017)

➢ What standards is DHL using to calculate carbon emissions?

We use the standard EN 16258:2012 (Methodology for calculation and declaration of energy consumption GHG Protocol Product Lifecycle
Accounting and Reporting Standard), the most acceptable standard globally. (DHL, 2017)

➢ What sources of emission factors are you using?

Road emission factors based on HBEFA (Handbook Emission Factors for Road Transport), Ocean emission factors based on CCWG (Clean Cargo Working Group), Air emission factors based on NTM (Network for Transport Measures). This is the basis for our used Vehicle Operation System (VOS). (DHL, 2017)

➢ Are you updating the emission factors to reflect changes in the fleet (aircrafts, vessels)?

Yes, not only the changes in fleet but we also take the actual utilization rate and the routing (transported distance) into account. Are you audited by an external auditor? Yes, our carbon management system and Corporate Social Responsibly report are audited annually by a 3rd party. (DHL, 2017)

➢ Is DHL also calculating emissions from other greenhouse gases such as NOx, SOx, PM and HC?

Yes, besides CO2 we also report CO2e (incl. CH4, N2O, SF6, HFC, NF3 and PFC). Upon request, our advanced reporting additionally can include NOx, SOx, CO, HC and PM. (DHL, 2017)

➢ Are you helping companies in all sectors?

Yes, the topic of green logistics is an important and an increasingly strategic topic in all industry sectors. DHL GREEN SERVICES are helping the likes of large multi-national automotive corporations as well as smaller fashion companies all with the same aim, to make their supply chain as carbon and cost efficient as possible. (DHL, 2017)

➢ What credits are you offering within the Climate Neutral service?

We offer Gold Standard CERs (Certified Emission Reductions), Gold Standard VERs (Verified Emission Reductions) and Voluntary Carbon Units (VCUs) which get certified by the (Voluntary Carbon Standard). All carbon credits fulfill Kyoto Protocol criteria. Our carbon credits are part of the voluntary carbon market and are not part of a cap and trade system (where emission allowances can be traded). (DHL, 2017)

What is CDP?

CDP (formerly Carbon Disclosure Project) is an international, not-for-profit organization, providing the only global system for companies and cities to measure, disclose, manage and share vital environmental
information. This online platform enables companies to disclose their carbon emissions information for public usage, such as financial market analysts. (DHL, 2017)
CONCLUSIONS

After all the research, it shows how the concept of corporate sustainability has developed during the decades. It began as a concept that give importance to society and how the organizations affect it, and not only given only importance to the economic profits in company performance. It developed in another concept as corporate responsibility, organizations began to include in its performance defining features of corporate sustainability, as leadership commitment, strengthening society, improving labor market. One of the Corporate society definition that explain the goal of it is that the organizations perform their activities making sure they leave a better world for the future generations.

Other issue that have been discuss it is environment and the company, to make a better world and preserve it, company must to consider their environment. Performing their activities including policies that improve the internal and external environment, affecting the natural environment, suppliers, customers... Also affects to the economy, the politics and the social environment. More and more companies and stakeholders are aware of the influence in the environment that organizations have, although it is difficult to calculate precisely how much it affects, there is not denial that the organizations have a responsibility with the environment and the world, and must do their best to influence in a positive way.

One of the important parts of a company it is their logistics, that is all the methods and means to performance and deliver their product or service. Part of the logistics is the Supply Chain Management, that include all the activities perform by the firm since the beginning (raw materials) until the delivery of the product or service. The research shows that several times in the studies logistics and supply chain management are used as a synonym. Also, this concept has evolved from the 80’s where each part of the process was study apart until nowadays where Supply chain management is a huge and important part of a company. Supply managers view the supply chain as a whole and improving their performance and using it as strategic variable, to improve the company profits.

Finally, green supply chain management is discussed. Green supply chain combines two concepts supply chain management and corporate responsibility (environment and company), the companies integrates green policies to their supply chain. For firms, nowadays the are two approaches: one is the firms that integrate a green supply chain, they are aware of its benefits for the world and more important for the firms, the idea is to achieve a reduce in costs and improve in profits and the importance of the green activities and the care of environment in society is increasing its demand from customers, that make companies win more customers. They use their green supply chain to attract new customers. Other approach is the one where the managers view the green supply chain as a cost and does not want to invest in it.
It is important to continue studying the Green Supply Chain and developed more awareness in the world and in organizations. Make the organizations aware of all the benefits they can have if they make their supply chain green.

All the tools and means they have got to achieve it. Explaining to them what it is eco-design, green purchasing and reverse logistics. The more companies implement it, the easier will be for the rest, until a unite sector with green activities form the industry and this will make a better world for society.
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