

**Ecole des Hautes Etudes Commerciales of
Algiers**

EHEC

**Thesis submitted in partial fulfillment of the requirements for
Master's Degree in Commercial Sciences**

Major: Distribution and Supply Chain Management

**The impact of green supply chain management on
operational efficiency**

Case study: Unilever

Submitted by:

Miss. Ines ZENNIR

Supervised by:

Dr. Farah RAHAL

Senior lecturer at EHEC

6th Promotion

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Dedication

To my parents, making you feel proud is all I could ever ask, you are my support system, my
first and greatest teachers to whom I'm forever grateful

To my dearest siblings, you are the greatest gift life has offered me

To my two nephews, you are the joy within my life

To my best friends for always being there for me

INES

Acknowledgements

I would like to start by extending my sincere gratitude to my mentor Dr. Farah RAHAL whose support, wise guidance, time, and constructive criticism enabled me to fulfill this work.

I'm also indebted to my mentor at Unilever Algeria Mr. Youcef ALI (Demand planner and S&OP lead) for whom I'm utterly grateful for his time, advice, encouragement, and shared experience.

Moreover, I would like to thank the whole team at Unilever Algeria; each one of them has been able to spare a moment of their time to make my experience there as beneficial as possible.

My deepest appreciation and gratitude also goes to Oussama A. Benhamou, his moral support and relentless efforts have helped me overcome countless difficulties throughout this work.

It goes without saying that I'm profoundly grateful to all my teachers that contributed significantly into enriching our knowledge, all the administrative staff as well as the entire faculty of EHEC for accompanying us throughout this journey, and providing us with the best means possible in order to launch us into the professional world with the necessary knowledge.

Abstract

Sustainable development is becoming more relevant for all companies, across all industries, especially to managers of the Supply Chain function, as a result of its importance and the role it plays in order to create value on the long term.

Incorporating environmental thinking within the supply chain is the most efficient manner to respond to this century's challenges of depletion of resources and waste problems. This practice doesn't only work as a solution for environmental obstacles but it also creates value throughout the chain and opens a door towards creativity, innovation and brand image optimization.

Unilever with its Sustainable Living Plan, that aims to halve the company's environmental footprint, while maintaining its growth, represents a perfect example for a company which is adapting to this century's requirements.

Through this work, supply chain managers at Unilever Algeria, will be able to see firsthand the impact of adopting Green Supply Chain Management related practices on the operational efficiency of the company, and this work is concluded with recommendations we've seen fit as solutions for the gaps observed throughout the research.

Key words: Environmental thinking, Green Supply Chain Management, Operational efficiency.

Résumé

Le développement durable devient de plus en plus important pour toutes les entreprises, dans tous les secteurs, en particulier pour les responsables de la fonction Supply Chain, de part pour son importance et d'une autre part pour le rôle qu'il joue dans le processus de création de la valeur à long terme.

Prendre l'aspect environnemental en considération dans la chaîne logistique est le moyen le plus efficace pour surmonter les défis de ce siècle que ce soit l'épuisement des ressources ou bien la gestion des déchets. Cette pratique ne constitue pas seulement une solution contre les obstacles environnementaux, mais elle crée également de la valeur tout au long de la chaîne et ouvre la voie à la créativité, à l'innovation et à l'optimisation de l'image de marque.

Unilever avec son plan de développement durable, qui vise à réduire de moitié l'empreinte environnementale de l'entreprise, tout en maintenant sa croissance, représente un exemple parfait d'une entreprise qui s'adapte aux exigences de ce siècle.

Grâce à cette recherche, les responsables de la chaîne logistique d'Unilever Algérie pourront constater l'impact de l'adoption de pratiques liées à GSCM sur l'efficacité opérationnelle de l'entreprise. Cette recherche se termine par des recommandations que nous avons jugées appropriées comme solutions pour les problèmes observée au cours de la recherche.

Mots clés: Engagement environnemental, Gestion de la chaîne logistique verte, Efficacité opérationnelle.

ملخص

أصبحت التنمية المستدامة أكثر أهمية لجميع الشركات ، في جميع القطاعات ، وخاصة لمديري وظيفة سلسلة التوريد ، نتيجة لأهميتها والدور الذي تلعبه من أجل خلق قيمة على المدى الطويل. إن دمج التفكير البيئي في سلسلة التوريد هو الطريقة الأكثر فعالية للاستجابة لتحديات هذا القرن المتمثلة في نضوب الموارد ومشاكل النفايات. هذه الممارسة لا تعمل كحل للعقبات البيئية فحسب، ولكنها أيضًا تخلق قيمة في جميع مراحل السلسلة وتفتح الباب نحو الإبداع والابتكار وتحسين صورة العلامة التجارية. مع خطة المعيشة المستدامة ، والتي تهدف إلى خفض البصمة البيئية للشركة إلى النصف ، مع الحفاظ على نموها Unilever ، تعتبر مثالاً للشركة التي تتكيف مع متطلبات هذا القرن. من خلال هذا العمل ، سيكون بمقدور مديري سلسلة التوريد بالشركة ، أن يروا بشكل مباشر تأثير تبنّي ممارسات الإدارة الخضراء لسلسلة التوريد على الكفاءة التشغيلية للشركة ، وقد ختمنا هذا العمل بتوصيات رأيناها مناسبة كحل للفتوات التي لوحظت خلال البحث.

الكلمات المفتاحية: التفكير البيئي ، إدارة سلسلة التوريد الخضراء ، الكفاءة التشغيلية.

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List of Abbreviations

Abbreviation	Full expression
CD ops	Customer development operations
CDD	Consumer direct development
DPMO	Defects per million Oppurtunities
ELV	End-of-life vehicles
EMS	Environmental Management System
EPA	Environment Protection Agency
EUP	Energy using products
FMCG	Fast Moving Consumer Goods
GSCM	Green Supply Chain Management
GTM	Go to market
HDSS	High density storage system
HSE	Hygiene, Security and Environment
ISO	International Organization For Standardization
JIT	Just in time
KPI	Key Performance Indicators
MENA	Middle east and North Africa
NGO	Nongovernmental Organization
REACH	Registration, Evaluation, Authorization, and Restriction of Chemical Substances
RM	Raw Material
RoHS	Restriction of Hazardous Substances
ROI	Return on investment
SCM	Supply Chain Management
SKU	Stock Keeping Unit
SRM	Supplier Relationship Management
TPS	Toyota Production System
TQM	Total Quality Management
USLP	Unilever Sustainable Living Plan
WCM	World Class Manufacturing

Summary

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General introductio

The problems of depletion of natural resources, global warming, the major emissions of toxic gases and environmental pollution are the real issues of this century and finding a solution is becoming essential not only for the survival of generations to come but also for all leaders, especially industrialists and managers of supply chain function considering the importance of this function and its impact on the environment.

Thus the concept of a green supply chain was born; this idea has gained the attention of many practitioners in many countries all through the decades, it's considered as a new challenge, and a rather worthy one in a world that continues to evolve beyond its abilities and its resources.

The pressure coming of external sources (consumers, NGO) and surrounding companies has also increased because such sources have decided that it's time to reunite and to push the companies into a more sustainable solution towards the society that they represent an important part of, and to take actions towards the problem of environment preservation.

Until now the only concern and goal of supply chain management is to gain a competitive edge and to minimize costs, all by maintaining the same level of service provided to the customer and by effectively allocating its activities (production, distribution, transport).

Today comes the necessity of considering the environmental aspect, i.e. implementing a green supply chain management practices and evaluating its impact on the company's operational efficiency.

Being considered a leader in supply chain management, and being classed within the top 5 of companies committed in sustainability plans. Unilever aims to halve its environmental footprints all while continuing to gain market share and profit, therefore the supply chain giant has implemented the Sustainable Living Plan «Unilever Sustainable Living Plan».

This plan has two major objectives:

Doubling the company's activity all while reducing its environmental impact and increasing its positive social impact, these goals are the beating core of Unilever's structure and especially its supply chain function.

As a result, the overall question study this thesis poses is: **What is the impact of implementing green supply chain management on operational efficiency?**

In order to reach a compelling answer for this question it was required to pass by several sub-questions, we mention:

1. Is implementing GSCM important in order to gain a competitive advantage?
2. Does implementing GSCM actually improve the company's environmental impact?
3. What value did GSCM add to the company's operational efficiency?

These sub-questions has led us into formulating initial research hypotheses, depending on prior personal perception and initial research, we have been able to conceive two main assumptions:

H1: GSCM is an efficient tool to enhance environmental impact and sustainability.

H2: Implementing GSCM can increase resource efficiency and lower production costs.

Keeping in mind the nature of the study, it seemed convenient to adopt a both descriptive and analytical approach through a qualitative study chosen according to this research's objectives, and that had as a purpose to collect maximum data through interviews held with managers at Unilever Algeria.

This work can be divided into two parts. First, the theoretical framework marked by two chapters.

The first chapter was to draw general attention to supply chain management through the first section and then to narrow the circle into the more evolved aspect known as Green Supply Chain Management accentuating in the process the differences laying between the two within the second section, this chapter has as a purpose to highlight the fundamentals of GSCM in order to further understand the concept, its drivers, benefits and practices through the last section of the chapter.

The second chapter within the theoretical framework deals with key factors of operational efficiency. The first section is about understanding the general concept of operational efficiency, and highlighting the main processes used in order to achieve and optimize it. As for the second section, we have been able to outline Key performance indicators, and recite the most important models used in order to measure supply chain performance.

The last section within this chapter highlighted the relationship between GSCM and operational efficiency setting path in the process for the second part containing the case study. Finally, the last chapter or the empirical framework is meant to present the company and analyze the results obtained from the collected data.

The first section of the chapter contains a general idea concerning the company Unilever Algeria in which the interviewees operate. The second section contains a detailed explanation

of the research methodology followed, in order to analyze and present the collected data within the interviews, this chapter has as a purpose to answer the ultimate research question and present its results.

This research has allowed us to refine our understanding of the phenomenon and its evolution, and to further understand the GSCM related practices, the methods actually chosen, and the impact of such practices on the company's operational efficiency.

**Chapter 01: Fundamental
*concepts of Green Supply
Chain Management***

Introduction of the chapter

Supply chains have come to evolve in a constantly changing manner, as a result different businesses are in need of help in order to not only adapt but also to catch up with these changes in a way where it is possible to measure the impact of the decisions they make.

One of the results of these decisions is the integration of environmental thinking, giving birth in the process to green supply chain management which has gained increasing attention over recent decades.

Depletion of natural resources, climate change and raising consumer concerns have been key reasons for greening the supply chains, which represents an approach that can significantly help improve processes and products performance all while incorporating an environmental thinking.

In this first chapter, we will discuss the basic concepts related to green supply chain management through three sections: the first section is intended to define what the traditional supply chain management is. In the second section we will discuss green supply chain management, its extent and the differences that lie between this discipline and the traditional one. Finally, in the last section we will focus on green supply chain management through studying the motivations for such a study to be born and analyzing its benefits, practices and drivers.

Section 01: Fundamentals of Supply Chain Management

Multiple and complex interactions between companies or different parties in order to deliver a product or a service to its final consumer is what defines a supply chain, as a result, it is considered that the manufacturer's ability to offer the right product with the right price at the right place, to the right customer within the right conditions and at the right time all while respecting the right quantity is determined by his ability to overcome uncertainties and inefficiencies anywhere within the chain in order to improve the overall performance and reach higher customer satisfaction.

In this first section, we will be discussing the definition of supply chain management and then analyzing its drivers.

1. Definition of Supply Chain Management

We always find different definitions of Supply Chain Management as a result of its revolutionary and multidisciplinary nature, and the fact that the term “supply chain Management” arose in the 1980s and came into widespread use in the 1990s, prior to that time the terms mostly used were “logistics” and “operations management”.¹

«Supply chain management is the active management of supply chain activities and relationships in order to maximize customer value and achieve sustainable competitive advantage. It represents a conscious effort by a firm or group of firms to develop and run supply chains in the most effective and efficient ways possible.»²

«...the systematic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole.»³

¹KOT (Sebastian): *Supply Chain Management: Fundamental and Support Elements*, 1st edition, 2013, p: 01.

²BOZARTH (C.Cecil) and HANDFIELD (B.Robert): *Introduction to Operations and Supply Chain Management*, Edition Pearson education, 2008, p8.

³ MARTIN (Christopher): *Logistics and Supply Chain Management*, Edition Pearson Education Limited, Essex, England, 1992, P.32

«A supply chain consists of all stages involved, directly or indirectly, in fulfilling a customer request. The supply chain not only includes the manufacturer and suppliers, but also transporters, warehouses, retailers, and customers themselves. »⁴

«Supply chain management is the coordination of production, inventory, location, and transportation among the participants in a supply chain to achieve the best mix of responsiveness and efficiency for the market being served. »⁵

Based on the multiple definitions, we can conclude that Supply Chain Management concerns all the activities necessary in order to plan and supervise a product's flow.

This operation ranges from the process of acquiring raw materials, production through distribution until the final customer all while passing by the necessary intermediates in the purpose of maintaining the most cost effective and efficient way possible

2. Supply Chain Drivers

Supply chain efficiency is obtained depending on the decisions each company makes regarding its supply chain drivers, it's about the tradeoff between efficiency and responsiveness.

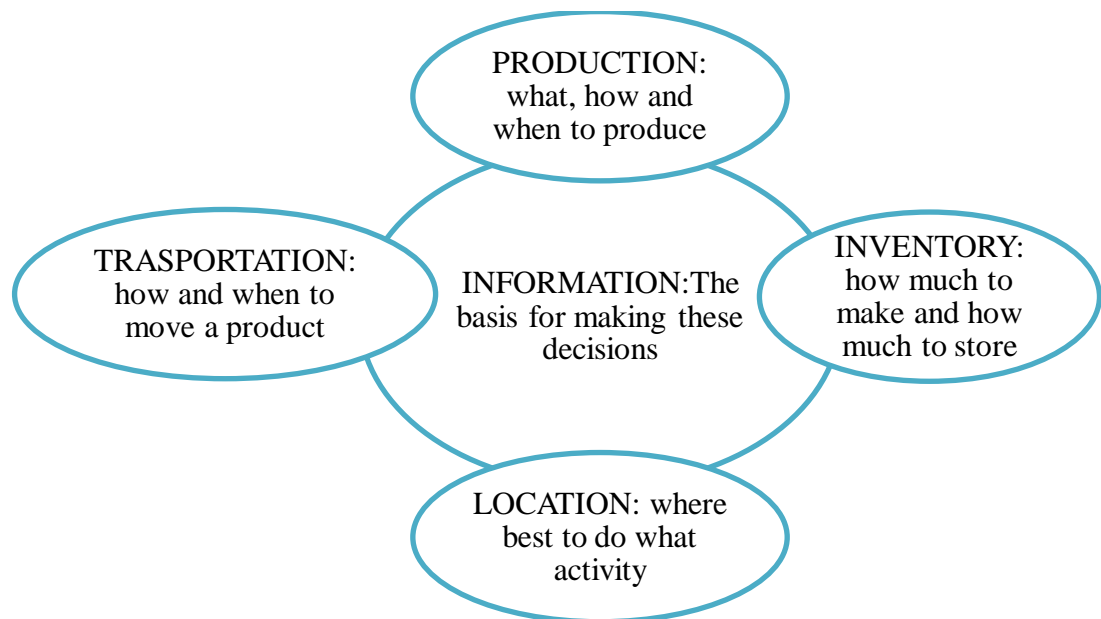
Therefore, the major drivers of supply chain performance are⁶:

⁴CHOPRA (Sunil) and MEINDL (Peter), *Supply chain management : strategy, planning, and operation*, Upper Saddle River, NJ, Prentice-Hall Inc, 2003, 2nd Edition, Chapter 1.

⁵HUGOS (H.Michael): *Essentials of supply chain management*, John Wiley and sons, 2011, p04.

⁶Ibid, pp 10, 17.

Figure n°1.1: SC drivers



Source: HUGOS (H.Michael): *Essentials of supply chain management*, John Wiley and sons, 2011

The figure is a simplified model of SC drivers that represent the basis on which decision making is done.

2.1. Production

Production in supply chain concerns its capacity to produce and store products while balancing between responsiveness and efficiency in order to make fundamental production decisions, using specialized facilities such as factories and warehouses where the capacity is being arbitrated depending on the level of responsiveness wanted, so an excess in capacity guarantees a certain adaptability to product demand, and flexibility to fluctuations.

However, it can also represent a hold back on efficiency because it won't generate any revenue and would cost money instead.

Factories are adapted to two main approaches in their manufacturing process:

- **Product Focus:** this requires performing different range of operations in order to make a product line, undergoing different transformations from manufacturing various

parts to the assembly of these parts. This approach helps developing expertise about a giving set of products at the expense of other sets of products.

- **Functional Focus**: this approach concentrates on performing some operations such as the assembly of parts, and it results the accumulation of expertise regarding a particular functions instead of a set of products.

Companies need to decide which approach or what mix of these two approaches will provide them with the possibility and expertise in order to best respond to customer's needs.

As for warehouses, they also can be built to accommodate different approaches. There are three main approaches to use in ware-housing:

- **Stock Keeping Unit (SKU)**: This represents a traditional but nevertheless an efficient and a simple way to store products of a given type together.
- **Job Lot Storage**: consists of storing different products related to the needs of a certain type of customers or the needs of a particular job together, which evidently allows a more efficient picking and packing operation however it can be space consuming and requires more storage space than the traditional SKU approach.
- **Cross-docking**: An approach that was pioneered by Wal-Mart in its drive to increase efficiency in its supply chain. In this approach, product is not actually warehoused in the facility. Instead the facility is used to house a process where trucks from suppliers arrive and unload large quantities of different products. These large lots are then broken down into smaller lots. Smaller lots of different products are recombined according to the needs of the day and quickly loaded onto outbound trucks that deliver the products to their final destinations.

This type of warehouses is only used for dispatching products coming from a point A in a truck (or any other necessary means of transportation), where a part of the merchandise is immediately transferred to a different truck (or another mean of transportation) in order to be transported to the point B, avoiding in the process any operation related to the storage of products. It is manly used in order to reduce transportation costs, with optimized routing, fewer miles are wasted, reducing fuel and associated vehicle service costs.

2.2.Inventory

Inventory is spread throughout the supply chain which means it includes everything from raw material to work in process to finished goods that are held one way or another by the manufacturers, distributors or retailers in a supply chain.

At this point, managers need to decide where they want to position themselves in the continuant trade-off between responsiveness and efficiency, because possessing large amounts of inventory increases the company's (or the entire supply chain's) responsiveness to fluctuations in customer demand.

However, the creation and storage of inventory is a cost and to achieve high levels of efficiency, this cost of inventory should be kept as low as possible.

There are three basic decisions to make regarding the creation and holding of inventory:

- **Cycle Inventory**: represents the amount of inventory needed in order to satisfy demand on a product, Companies prefer to purchase and sell in great quantities in order to reach the advantages that economies of scale can provide. However, large lots can present a holdback as a result of increasing carrying costs.

Carrying costs does not only involve storage cost but also the cost required in order to handle, and insure the inventory, that's why managers once again find themselves facing the tradeoff between the reduced cost of ordering in small quantities or the better prices offered by purchasing products in large lots despite the increased carrying cost of the cycle inventory.

- **Safety Inventory**: As a result of the inaccuracy of demand forecast, safety inventory is a must against uncertainty, it is held as a buffer in order to help face any unexpected events.

Since any forecast has a certain degree of miscalculations, additional inventory is held in order to cover that uncertainty to a greater or lesser degree in case demand has suddenly increased greater than anticipated so the tradeoff over here would be between carrying the cost of additional inventory or those of losing sales due to insufficient inventory.

- **Seasonal Inventory**: it's an inventory that is held in order to help anticipate and satisfy the predicted rising demand during a certain period of the year.

Once again managers would be facing a tradeoff between holding a seasonal inventory and the cost that this option carries or providing flexible manufacturing facilities that can adapt quickly and change the production rate according to demand rate in order to respond perfectly to demand fluctuations

The alternative solution to holding up a seasonal inventory would be investing in flexible manufacturing which can provide a quick and flexible rate when changing their production levels responding to increases in demand, in this case the tradeoff is between the cost of carrying seasonal inventory and the cost of having a more flexible production capability.

2.3.Location:

This aspect refers to the geographical whereabouts of supply chain; it also indicates the decisions concerning the activities performed in each facility, as the previous drivers, location too offers a tradeoff concerning the decision whether to centralize activities in order to gain efficiency and economies of scale, or to decentralize activities in order to be more responsive as a result of the reduces distance from customers or suppliers.

When making these sorts of decisions, many factors are taken under consideration such as the cost of facilities and workforce, taxes, and proximity of suppliers and customers, location decisions are strategic ones as a result of the large amount of money they require to long term plans, and the impact they have on the cost and performance of a supply chain.

2.4.Transportation:

Transportation in a supply chain represents the movement of everything from raw materials to finished goods between different facilities.

When it comes to this aspect, the tradeoff between efficiency and responsiveness manifests in the choice of transportation mode, faster modes (airplanes) are very responsive but cost more in comparison with slower but cost efficient modes (rail and ship).

2.5.Information

This fifth aspect is considered the basis upon which managers take decisions concerning the other supply chain drivers; it represents the connection between all activities of a supply chain in order to make strategic and profitable decisions based on complete, accurate and time efficient data which can enable managers to make operating decisions. However, the cost of building and installing systems to deliver this information can be very high.

Information in supply chain is used for:

- **Coordination:**

Coordinating frequent activities related to the other drivers: production, inventory, location and transportation.

The data acquired is used in order plan production schedules, stocking locations, inventory levels and transportation modes.

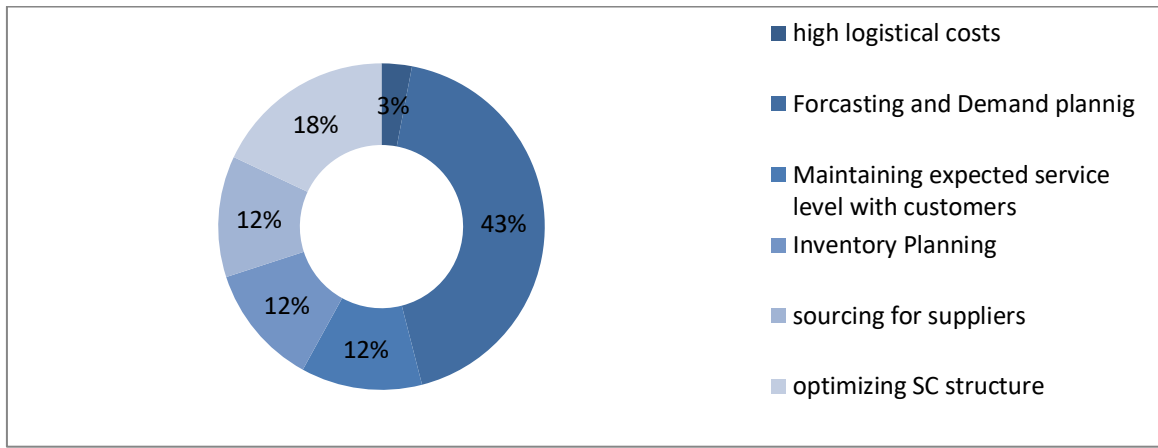
- **Forecasting and planning:**

In order to anticipate and meet future demand, strategic forecasts are made to guide monthly or quarterly production timetables based on available data.

The responsiveness versus efficiency tradeoff over here is related to making a decision regarding whether to share information with other companies or not to, and if so what amount of information to be shared and what amount to be kept private.

In a supply chain the tradeoff between responsiveness and efficiency is not the only challenge that can be faced; there are other equally important challenges with a great effect on the chain, amongst which we have:

Figure n°1.2: Supply chain challenges



Source: made by me based on, McKinsey Global Survey results: the challenges ahead for supply chains, November 2010.

This figure represents the challenges facing the supply chain, starting from the difficulty of planning and forecasting demand –that’s considered the biggest obstacle- to the costs resulting from such activities.

Section 02: From SCM to GSCM

Supply chain has been known to have the outmost environmental impact within a firm as a result of its importance and implication, in order to minimize this impact, actions are made regarding the SC as a whole, starting from raw material sourcing until the delivery of finished goods to the final consumer and going further to reach the point of handling post use product components in order to limit and minimize the ecological impact.

Facing the consequences related to the degradation of the environment, Supply Chain managers became more aware of the importance of integrating environmental thinking into their SC, this awareness was a direct result of internal motivations (the desire to cut costs, enhance the quality of the product ...) and external ones (regulation, consumer pressure, gaining competitive advantage, enhance the brand image...).

1. Definition of Green Supply Chain Management

Green Supply Chain Management is a supply chain that aims to reduce its activities' impact on the environment in every step of the product's life cycle: conception, purchasing, production, packaging, logistics, distribution and recycling.⁷

«GSCM is a managerial approach that seeks to minimize a product or Service's environmental and social impacts or footprint.»⁸

«GSCM is the set of SCM policies held, actions taken and relationships formed in response to concerns related to the natural environment with regard to the design, acquisition, production, distribution, use, re-use and disposal of the firm's goods and services.»⁹

«green supply chain management can be defined as the integration of environmental thinking into supply chain management, including product design, supplier selection and material sourcing, manufacturing processes, product packaging, delivery of the product to consumers, and end-of-life management of the product after its use.»¹⁰

It's mainly about adding green components into the SC as a result of environmental concerns following steps such as:

- Reduce energy consumption.
- Reduce natural resources consumption.
- Reduce waste and pollution.
- Recycling waste.

⁷ HERVANI AREF (A), HELMS (M), SARKIS (J), *Performance measurement for green supply chain management, in Benchmarking: An International Journal*, N° 12, 2005, pp.330 – 353, translated by me.

⁸ RETTAB (Belaid) and BEN BRIK (Anis), *Green Supply Chain in Dubai*, Dubai Chamber Centre for Responsible Business, Dubai, UAE, 2008.

⁹ ZSIDISIN (George) and SIFERD (Sue), *Environmental Purchasing: A Framework for Theory Development*, European Journal of Purchasing & Supply Management, 2001.

¹⁰ SUNDARAKANI (Balan), DE SOUZA (Robert), GOH (Mark) and VAN OVER (David), *A Sustainable Green Supply Chain for Globally Integrated Networks*, 2010, p43.

GSCM extends beyond environmental regulation, for Porter and Van Der Linde “investing in a Green supply chain helps eliminate waste and enhance productivity”¹¹, and for Wilkerson implementing a GSC can reduce logistics costs and enhance efficiency and flexibility.

2. The extent of GSC

SC aims to manage in an optimal manner the integrity of informational flow, physical flow, financial flow and all the parties (producers, suppliers...) involved in the process of providing a product or a service. It is in fact an activity that touches all functions within a company.

GSC covers all the phases of a product’s life cycle: from obtaining raw material, to the products’ treatment post use (reuse, recycling...), passing by its conception, production, distribution and its use by the consumer.

When it comes to GSC, the products’ life cycle must be comprehended and handled as a set of equally important steps, because each one can represent a source of negative impact on the environment

The initial linear model of the traditional SC has been changed into a cyclic model, where SC approach concerns all parties contributing to the economical life: suppliers, third parties, distributors, clients and consumers.

3. The differences between SCM and GSCM

Supply chain management is a cross-functional approach. The management of activities that procure materials and services then transform them into intermediate goods and final goods or products and deliver them through a distribution system to point of production consumption.¹²

Business activity has reached the point where it can become a source of substantial negative effect on the environment, which represents one of the reasons for which GSCM

¹¹ PORTER (E. Michael) and VAN DER LINDE(Class), *The Journal of Economic Perspectives: toward a New Conception of the Environment-Competitiveness Relationship*, Vol. 9, No. 4, 1995, translated by me.

¹² BOWERSOX (Donald), CLOSS (David) and COOPER (M.Bixby), *Supply Chain Logistics Management*, McGraw-Hill Education, New York, 2007.

emerged, making it possible to integrate environmental thinking into supply chain management.

The green supply chain focuses on changes in the following five aspects compared to traditional types of supply chain:

Table n°1.1: Differences between the Green Supply Chain Management and traditional Supply Chain Management

	GSCM	TSCM
The goal	seek to maximize economic benefits, to decrease the consumption of resources and energy and to reduce the emissions of pollutants, all in an effort to create a socially responsible enterprise, and to balance the economic benefits, social effects and environmental effects	lower the cost and improve the efficiency of supply chain enterprise so as to maximize the economic benefits
Management structure	environmental performance is included in the company's internal and external management	environmental performance is not included in the company's internal and external management
Business model	A more complete business model through the whole life cycle as it includes low carbon and environmental Protection	The business model through the traditional supply chain management is less complete as compared to the green one

<p style="text-align: center;">Business process</p>	<p>The green supply chain changes the traditional management mode and hopefully realizes “Cradle-to-Reincarnation”, In green supply chain thinking, product flow is circular and reversible and all products must be managed throughout the entire life cycle, and beyond.</p> <p>As a result “waste” finds a second life or becomes raw material available for new production or other purposes.</p>	<p>Starts with suppliers and ends with users, and the products flow is one-way and irreversible, known as “Cradle-to-Grave”.</p>
<p style="text-align: center;">Consumption pattern</p>	<p>Green supply chains can be promoted through green government procurement, corporate social responsibility, and sustainable consumption education and practices</p>	<p>is a voluntary initiative governed by consumer interests and business activities</p>

Source: CCICED Annual General Meeting 2011

The table highlights the most significant differences between GSCM and the traditional SCM in terms of goal, structure, process, model and finally pattern. Where as they have a common goal of reducing cost and improving efficiency, the HOW and effect are completely different.

Section 03: GSC: Motivation, benefits and practices

Environmental issues are becoming more and more relevant and substantially significant especially in industries with great environmental impact, in addition to the customers becoming more environmentally conscious and aware of the importance of reducing the negative effect on the environment and that of greening the supply chain.

1. Motivations and benefits of Green Supply Chain management

1.1. Motivations for implanting Green Supply Chain

Strategically elaborated motivations push today's managers into adopting a GSC, in addition to the clients becoming more and more environmentally conscious and interested in their consumption's impact on the environment.

We find that these are the main reasons for which GSC is becoming more and more relevant.

- Regulations: the majority of firms want for their procedures to be conform to legislations and regulations in order to meet and anticipate future requirements.
- Enhancing brand image: the brand image is an important factor that pushes firms to satisfy continually new and fluctuating demands of consumers.
- Reducing costs: this factor is mainly about reducing energy consumption, raw material use, waste evaluation and other procedures in order to cut costs and reduce the SC's costs.
- Innovation: implementing a GSC drives firms to innovate on a continuant basis regarding their process and organization in order to gain a competitive advantage.
- Environmental concerns: this represents a genuine approach resulting from real precautions, concerns, and desire to minimize the negative impact on the environment.

Keeping in mind that the ultimate purpose of a firm is to create value, and not to protect the environment, it is however essential to understand that the decisions made by the company have a direct and a somehow strong impact on the well being of the environment.

For a more eco-responsible approach, any company can be incited into adopting a more environmental-friendly approach based on the following reasons¹³:

1- Meeting the challenge of global, environmental and socio-economic issues, contributing to the general interest:

In light of current data, we can see that our planet is deteriorating; climate change has become an issue, depletion of natural resources...

Businesses, as well as communities, have a key role to play in meeting this environmental preservation challenge, as noted. Through their own activities, they have a significant effect on the environment and natural resources. Through its purchasing policy, its methods of production, its consumption of water, energy, the production of waste, the modes of transport, any company impacts directly or indirectly the environment and certain social aspects. . By committing to an environmental approach, it fully assumes its triple responsibility: economic, social and environmental.

2- Contribute to the continuous improvement of the quality of the public service and to the economic efficiency of its structure:

By choosing to become eco-responsible while maintaining and seeking to improve the quality of the service provided, the administrations and the communities participate fully in their public service mission: respect for the environment, taking into account the interest of future generations as well as the environment, and interests of the company itself.

3- Create a transversal dynamic between departments through meetings held by main parties of the company around a common project:

To join in an approach of eco-responsibility is to engage a transversal project within the teams and the structure. Internally, sustainable development is a source of innovation and value creation, and therefore a source of efficiency.

4- To be credible and consistent compared to its partners, being exemplary in its internal practices:

¹³ <http://redd.ddrhonealpesraee.org/node/45> consulted on March, 15th ,2019, at 02:29 pm.

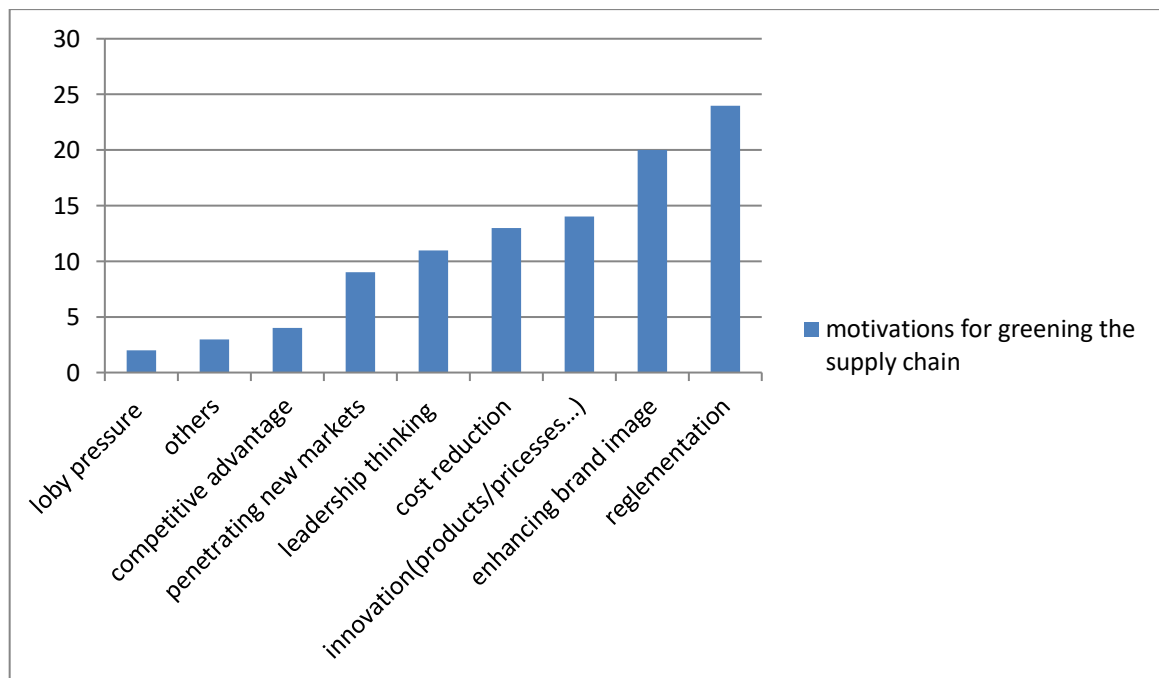
To be credible, the momentum committed by the National Strategy for Sustainable Development requires the company to set an example in terms of sustainable development. By integrating environmental and social concerns into its internal activities, the company sets a good example and has an exemplary role.

5- **Meet the expectations of citizens and different stakeholders, create a dynamic on the territory:**

Citizens (who represent the customers, suppliers or partners) are themselves increasingly aware of the challenges of sustainable development and, in particular, the need to change their daily actions and behaviors to help address global issues.

They expect the company today to be also committed to this path in their operation and management of their resources.

Figure n°1.3: Motivations for greening the SC



Source: Observatoire de la Supply Chain 2008 Supply Chain verte : enjeux et maturité des entreprises, p20

As the figure shows, motivations for implementing a GSC exceed just the need to gain competitive advantage even if that represents an important motive.

It is more about following and respecting laws and enhancing brand image which represent the highest percentage, in addition to the role that adapting to today's technologies and the need to reduce costs play as a motive.

1.2. Benefits of implementing Green Supply Chain

The common misconception that greening the supply chain costs additional expenses still exists despite facts proving otherwise, due to the lack of a systematic approach and willingness to engage in environmental thinking.

Key benefits of GSCM would include not only the positive long term effect on the company's financial performance but also a significant decrease in costs, new opportunities for competition and innovation, in addition to benefits regarding all concerned parties including consumers, workforce, society and government ...

We will summarize here the three main benefits of engaging in a sustainable development approach:

1- Ensure the survival of the company through the creation of value and continuing to do so

The main purpose of any company is to create value, but this goal can't be fulfilled properly on a planet that continues to suffer from negative consequences due to many fluctuations including climate change.

Even though this ongoing crisis can be a source of income for many companies and consequently can feed on it, if the temperature of the Earth continues to increase at the current rate the most pessimistic forecasts are already outdated, at the moment. By the end of this century, our human societies will be in serious difficulties.

Evidently, we come to understand that the continuity and survival of any company in related to its sense of responsibility and therefore must actively participate in local, national and even international contexts, admittedly, depending on whether the company's activity is a source of pollution or not and if so, the degree of that pollution.¹⁴

2- Improve the economic and financial efficiency of the company

¹⁴ WIDLÖEGER (Patrick), QUERNE (Isabelle), *Le guide du développement durable en entreprise*, les échos éditions, Paris, 2009, p. 27. Translated by me

As it was already mentioned, sustainable development's impact on the economic and financial performance regarding a company is related to that company's activity, so basically it changes according to the company's direct or indirect involvement in the sustainable development, or whether the company sees it as key element in organizational efficiency and the nature of the company's activity (whether it's polluting or not).

That being said, the sustainable development is being considered as a major part of the economic and financial efficiency due to many reasons, among which we have:

- Sustainable development is a cost reducing procedure that promotes minimizing the use of natural resources, optimizing production which leads to reduced costs all while keeping a sustainable and consistent growth.
- Sustainable development can also be a source of revenue, through the 4R's (reduce, reuse, recycle and recover) for example: instead of paying a company to get rid of your paper, cartons and other wooden pallets, you offer it to a company specializing in waste recovery to buy them at the market price. This represents new revenue.

Also, sustainable development actions will make it possible to anticipate risks, whether environmental, financial or legal. Of course, depending on the nature of the company's activity that represents a major factor in the appearance of these risks.

3- Adapting the company to today's actual context of sustainable development

The continual and rapid evolution of the context that the company exists and operates within is another reason for which it is essential for it to engage in sustainable development, depending on the degree of the fluctuations concerning consumer behavior, the evolution of laws and regulations, the media, politicians, local authorities and the emergence of NGOs¹⁵. To sum it up, greening the supply chain is becoming more and more a competitive advantage for companies as it represents a key factor of sustainability and offers multiple advantages regarding cost reductions, generating new revenues and innovative sources of income, risk management and risk reduction factor, key element for staff motivation and an efficient method to adapt to the requirements of the current environmental context.

¹⁵ Ibid, p29.

It is also an effective way for the company to show a good level of social responsibility and making it know for the public in a strategic manner which would ultimately make it easier to attract investors, to promote the loyalty of old customers and attract new ones.

That being said, GSC can become a real performance driver. It makes it possible to achieve faster and in better conditions the objectives set in the general strategy of the company, and, certainly, to improve the operational efficiency.

Green supply chain's benefits regarding cost and quality can be resumed into:

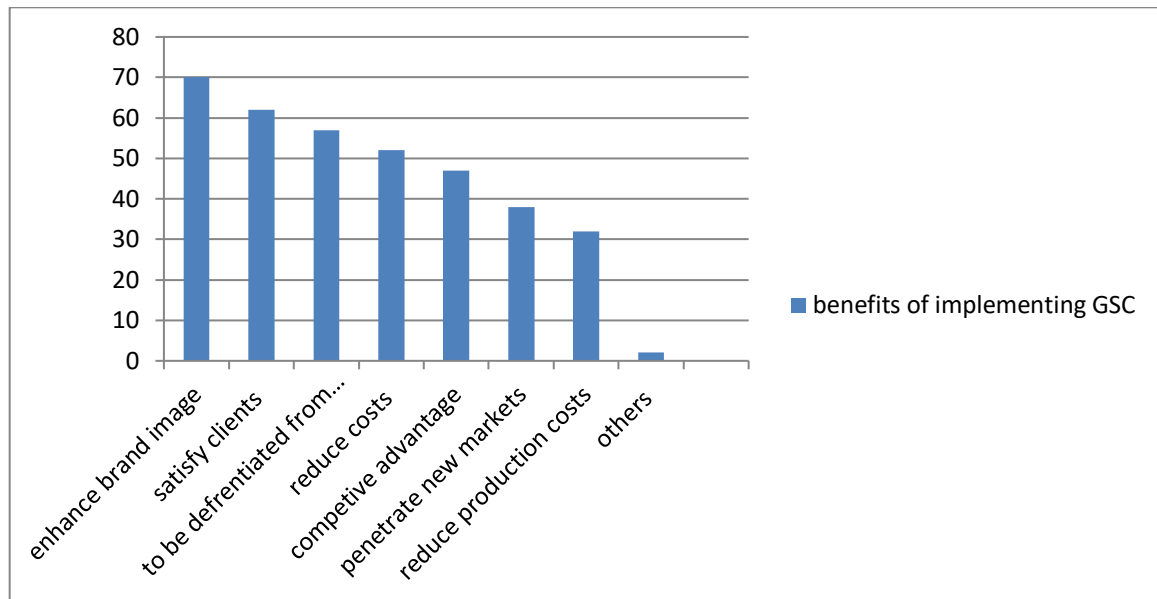
1- Cost:

- Reducing energy consumption
- Reducing waste
- Reducing packaging
- Reducing logistics costs
- Reducing manufacturing costs
- Gaining competitive advantage
- Optimize logistics and manufacturing process
- Penetrate new markets
- Enhance profits
- Optimize distribution process
- Optimize warehousing costs
- Avoid paying penalties for non conformity

2- Quality:

- Enhance brand image
- Satisfy consumer needs
- Meeting the consumer's expectations
- To be differentiated from competitors

Figure n°1.4: Benefits of implementing GSC



Source: Observatoire de la Supply Chain 2008 Supply Chain verte : enjeux et maturité des entreprises, p26.

The figure represents the degree of impact that each advantage -resulting from implementing GSC- has on the operational efficiency of the company in question, where we can notice at first hand that the biggest effect would be in terms of enhancing the brand image where the company gains a reputation for being environmentally conscious.

GSC's advantages goes beyond brand image as the figure shows, where we can notice its contribution in reducing costs and penetrating new targeted markets.

2. Green Supply Chain Management's practices

Green supply chain practices can be summarized into:

2.1.Green design:

This represents incorporating environmental thinking into the design of products or services provided, which can show by not using hazardous or restricted materials during manufacturing, a process that can be related to product safety and environmental risk management.

As a result, minimizing the amount of waste during the process of production and creating a strong base for remanufacturing or recycling.

It's about taking in consideration matters related to the environment's protection and the product's quality during its life cycle, with the possibility of being reused or recycled.

Techniques such as life cycle assessment are used to assist in the determination of how to design a product to minimize its environmental impact over its useable life and afterwards¹⁶

2.1.1. Field of application:

Green design approach applies in the majority of cases to the product itself or to the different components, packaging, etc.

It applies to other elements such as manufacturing processes (which allow for example to reduce the energy consumption or decrease production of waste).¹⁷

We distinguish different types of green design approaches:

- Partial green design: that aims to improve existing products and / or processes.
- Total green design: This is about transforming products radically, giving place to new products. Green design is, in this case, an interesting source of innovation.

According to the German Environment Agency, 80% of the environmental impacts associated with a product are determined during its design phase.¹⁸

Green design includes the following steps:

- Designing products with minimum material and energy consumption during the production and during its use
- Designing products with the possibility of being reused, recycled and the possibility of recovering certain components.

Nearly 70% of companies that have adopted an eco-design approach claim to have facilitated the recycling of their products.¹⁹

¹⁶ LINTON (Jonathan), KLASSEN (Robert) and JAYARAMAN (Vaidyanathan): *Sustainable supply chains: an introduction*, Journal of Operations Management, USA, 2007, p. 1076.

¹⁷ Observatoire de la Supply Chain, *Supply Chain verte : enjeux et maturité des entreprises*, Avril 2008, p29, translated by me.

¹⁸ Ibid, translated by me.

¹⁹ Ibid, translated by me.

- Designing products that help avoid or reduce the use of dangerous or polluting materials.
- The use of clean technologies. In this case, companies find it profitable to invest in clean technology rather than in equipment intended to treat production waste (waste treatment centers).

2.2.Green packaging:

It's important to understand that the product and the material used to produce it are not the only factors responsible for leaving an environmental footprint, but also its packaging, this is why green packaging is an essential practice within the GSC.

Moreover, the benefits harvested out of the use of sustainable packaging ranges from benefits to the company, the consumers and the society as a whole as a result of efficient use of energy and materials, which leads to reducing costs.

When it comes to the supply chain and logistics, an appropriate packaging helps reduce delivery time, storage and transportation costs, which evidently leads towards higher levels of efficiency, in addition to the increased safety levels for consumers' health resulting from the use of sustainable packaging, simplifying the recycling process and minimizing package waste.

Green packaging generally goes hand in hand with green design, due to the important benefits of designing a product while having clear ideas on the efficient packaging to be used, which can lead to reducing the negative environmental impact and develop greener solutions.

2.3.Green procurement:

«The notion green procurement includes all operations done between the concerned party and suppliers or third parties who are environmentally conscious and committed in integrating eco-thinking into their business.»²⁰

when purchasing a product , a service or raw materials it is important to understand the effects that the nature of these elements has all through the supply chain, therefore many

²⁰ Ibid, p34, translated by me

companies that are environmentally conscious have specific requirements that needs to be fulfilled by their contractors or suppliers in order to go through a business deal.

The upstream company needs to respect and uphold the requirements and conditions set by the downstream company if they wanted to provide them with their services or goods.

«Green procurement ensures that supply chain managers are supervising the process of purchasing goods or services that minimize environmental impact, in addition to the traditional procurement standards such as price, quality and delivery date, even though purchasing green material represent additional costs, it can create economical value as a result of the limited resource consumption, enhancing brand image, reducing waste and environmental costs. »²¹

Green procurement within environmentally conscious companies includes certain steps, starting with:

- Green outsourcing: the term green outsourcing includes all purchasing operations realized with suppliers or third parties that integrate environmental thinking into their operations, as a result suppliers that are certified according to ISO 14000 are privileged in compared to others.
- Cooperation with suppliers in order to reach environmental objectives.
- 4R'S: (reduce, reuse, recycle, and recover) during the procurement process, for example: using concentrated components in order to reduce packaging.

Green procurement goes beyond environmental thinking and impact, it's about comparing prices, technology and quality in order to come out with the best trade of balancing these factors.

2.3.1. Obstacles of green procurement:

- The purchase of a green product requires to consider the cost of acquisition, but also all the costs generated throughout the life cycle of the product, including the cost of use, the cost of maintenance and treatment costs at the end of product life (recovery, recycling, etc.). The Total Cost of Ownership therefore includes all the costs of a product generated over its entire life cycle.

²¹ MIN (Hokey), GALLE (William): *Green Purchasing Strategies: Trends and Implications*, International Journal of Purchasing and Materials Management, Volume4, USA, 2011, p. 10.

- The second obstacle to the implementation of a green procurement approach is the difficulty of setting up, this approach requires adopting a green policy that demands a revision of the internal procurement procedures.

2.4.Green manufacturing:

It represents a combined production procedures that helps minimize waste, limit pollution and reduce raw material and energy consumption, in addition to promoting positive ecological business operation practices such as recycling and reusing.

Green manufacturing has reached the point where it is no longer an option but a necessity in order to preserve the consumers' well being and the survival of the company in the competitive world of today, where companies compete in order to gain production efficiency and reduce the ecological burden by using the appropriate material and technology.

It includes:

- 4R's of green manufacturing in order to reduce waste production and pollution.
- The use of new and appropriate technology.

Justification to invest and implement green manufacturing techniques stems from three main aspects.

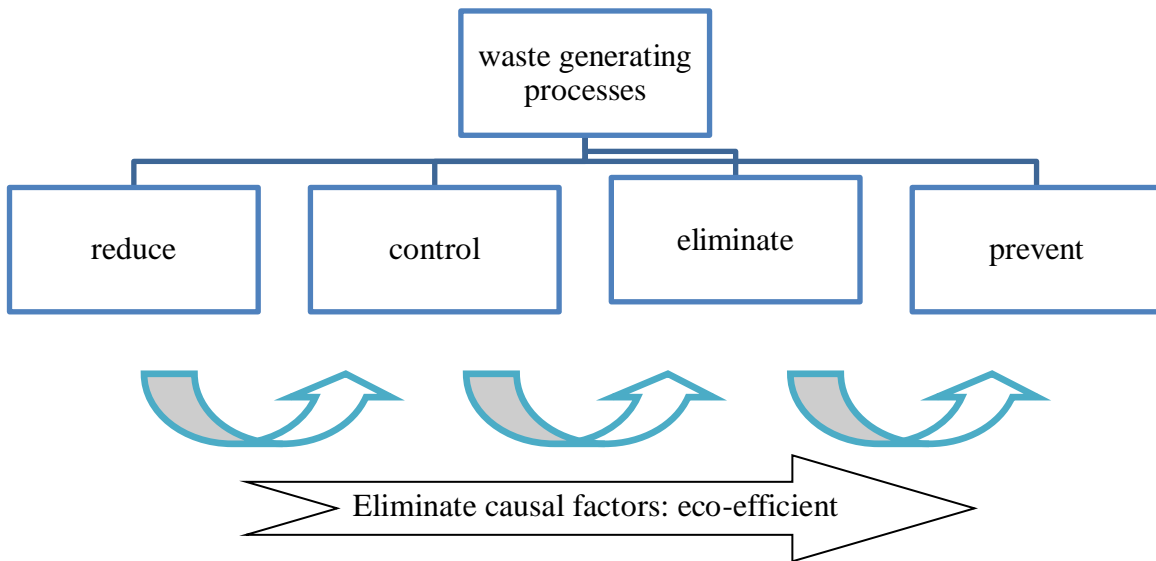
These aspects are briefly discussed as follows²²:

2.4.1. Green manufacturing and efficiency

Minimize waste through strategies that enable the company to make the same product or better with fewer resources and less energy consumption in order to reach efficiency.

²² DEIF (Ahmed): *A system model for green manufacturing*, Journal of Cleaner Production, USA, 2011, p. 1553.

Figure n°1.5: Green manufacturing and waste



Source: A system model for green manufacturing, Journal of Cleaner Production, 2011

The figure is a simplified model of managing green manufacturing with the goal of reducing to preventing waste by eliminating all its causes and sources in order to adopt a more eco-efficient approach.

2.4.2. Green manufacturing and market share

With new customer demands and higher awareness, together with tougher global competitiveness pressure, manufacturing enterprises need to review their manufacturing strategies.

Green manufacturing should be viewed as an opportunity to expand the local and global market share in this dynamic environment.

A deeper understanding of green manufacturing strategies and techniques will enable manufacturers to realize that unlike other competing manufacturing strategies (like cost and time), being green positively impact all other manufacturing competitive edges. For example: going green in manufacturing will improve the quality of the production process which will in turn impact product quality and also will be more appealing to the growing number of customers looking for green manufacturers and products.

2.4.3. Green manufacturing and government support and regulations

Pressure from governments to evolve into green manufacturing is increasing. Based on the previous aspects, the transformation of current manufacturers into becoming greener can be economically justified.

2.5. Green logistics:

« Green logistics is defined as the study of the environmental effects of all the activities involved in the transport, storage and handling of physical products as they move through supply chains in both forward and reverse directions. It assesses the nature and scale of these effects and examines the various ways in which they can be reduced. »²³

It represents the integration of environmental aspects in different logistical activities concerning storage, packaging and transportation of products.

It includes certain steps:

1. Green packaging: the use of ecological, sustainable or recycled material and enhancing packaging design in order to reduce waste and costs.
2. Green transportation: coordinating commands and optimizing distribution paths reduce the frequency of distribution, energy consumption, the number of warehouses throughout the supply chain and therefore costs and carbon emissions.

Another viable solution would be to use shared databases managed by specialized companies to support reloading in order to reduce traffic (number of trips, distances traveled, etc.) and reduce delivery time, In addition to the use of more environment-friendly transportation modes in order to reduce energy consumption and reach efficiency.

3. Warehousing: designing facilities in accordance with the standards of green-construction in order to limit the leak of pollutant emissions into the environment and thus reduce the ecological footprint with the help of clean technologies.

2.6. Reverse logistics:

²³MCKINNON (Alan), BROWNE (Michael), PIECYK (Maja) and WHITEING (Anthony), Green Logistics Improving the environmental sustainability of logistics, Kogan Page; Third edition, 2016, p04.

«Reverse logistics is the process of planning, implementing and controlling the efficient, effective inbound flow and storage of secondary goods and related information opposite to the traditional supply chain direction for the purpose of recovering value or proper disposal. »²⁴

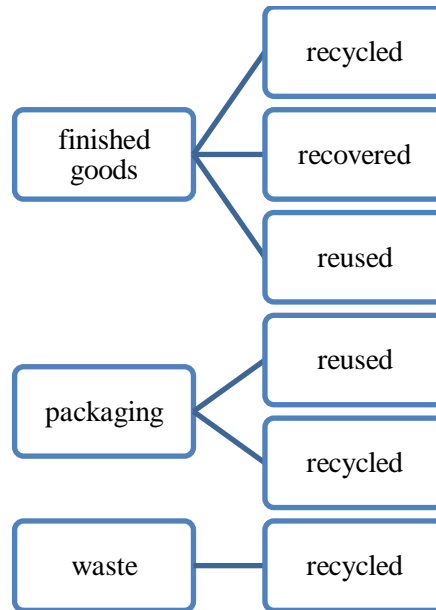
contrary to the common course of logistics process going from the manufacturer to the distributor, when it comes to reverse logistics the process goes in the other direction i.e. from customers to distributors or manufacturers, or in the case where products stay at the possession of consumers beyond the end of its life date, where firms should establish a process to recollect these items from the customers so it can be properly handled. This represents an important challenge to operation management to recollect the defective or unused products, to be sorted then inspected, recycled, reused, remanufactured or destroyed for the purpose of maximizing the value of unused or defected products, minimize cost and protect the environment

GSCM includes factors beyond environmental thinking; it also focuses on the economic aspects, the reverse logistics process is designed to achieve efficiency and economic benefits for the firm in question.

Reverse logistics aims to maximize the value of products or materials, however, when products can't be repaired or reused as they are, they are destroyed and recycled.

²⁴ FLEISCHMANN (Moritz), *Quantitative Models For Reverse Logistics*, Springer, 2001, p06

Figure n°1.6: Product or material reassessment



Source: made by me based on GRANT (David), WONG (Chee Yew) and TRAUTRIMS (Alexander), *Sustainable Logistics and Supply Chain Management*, 2017.

The figure represents a simplified process of reassessing products or materials from packaging to waste, resulting from the production process, where the objects in hand are either recycled reused or recovered depending on its degree of utility, the degree of damage and its nature.

Table n°1.2: Summary table of green practices in supply chain management and their benefits

	Practices	Advantages
Green design	<ul style="list-style-type: none"> - reducing raw material and energy consumption during production and use. -designing products easy to be reused/recycled/recovered. -minimizing the use of hazardous material. -Use of clean technologies. 	<ul style="list-style-type: none"> -Enhance the chances of reusing and recycling the products. -Reach efficiency.

<p>Green packaging</p>	<p>-the use of sustainable packaging with appropriate design.</p>	<p>-Efficient use of energy and materials, which leads to reducing costs. -Reduce delivery time, storage and transportation costs. -simplifying the recycling process and minimizing package waste -reducing the negative environmental impact and develop greener and healthier solutions.</p>
<p>Green procurement</p>	<p>-4R’S: (reduce, reuse, recycle, and recover). -Cooperation with suppliers. -Green outsourcing.</p>	<p>-Reduce environmental impact -Enhance the company’s “green” image.</p>
<p>Green manufacturing</p>	<p>-using the appropriate material and technology. -promoting positive ecological business operation practices such as recycling and reusing. -The use of new and appropriate technology. - setting an Environmental Management System (EMS) to monitor and steer the different actions and thus have a better visibility of the level of effectiveness.</p>	<p>-gain production efficiency and reduce the ecological burden. -helps minimize waste, limit pollution and reduce raw material and energy consumption.</p>
<p>Green logistics</p>	<p>-using sustainable or recycled material. -enhancing packaging design in order</p>	<p>-Reducing additional cost of construction. -the return on investment is</p>

	<p>to reduce waste and costs.</p> <ul style="list-style-type: none"> -Green transportation. -using shared databases. -using less polluting transportation modes. -Warehousing. 	<p>growing faster.</p> <ul style="list-style-type: none"> - reducing waste. -reducing delivery time. -reduce energy consumption and reach efficiency.
Reverse logistics	<ul style="list-style-type: none"> -recollect the defective or unused products, to be sorted then inspected, recycled, reused or remanufactured. 	<ul style="list-style-type: none"> -Maximize the value of unused or defected products. -Minimize cost and protect the environment. -Achieve efficiency and economic benefits.

Source: Fulfilled by me based on sub-section 02

The table represents a summary of all the GSCM’s practices and the actions taken in order to maximize the advantages of each one of these steps.

The practices are connected and have a common advantage of achieving efficiency as they are all based on the 4R’s approach which will allow any company to maximize its value with minimum consumption of resources.

3. Drivers of GSCM:

In order to further understand the reasons for which GSCM has emerged, it is essential to determine the GSCM drivers²⁵

As a result, this subsection below highlights the main drivers that push businesses into adopting green and environment-friendly practices.

There are five primary categories of environmental stakeholder groups that drive green supply chain initiatives within an organization:

²⁵ AKKUCUK (Ulas), *Ethics and Sustainability in Global Supply Chain Management*, IGI Global, USA, 2016,pp 239-240

3.1.Regulatory stakeholders:

«Who either set regulations or have the ability to convince governments to set standards. »²⁶

Regulatory stakeholders include governments and trade associations that are able to force companies to adopt environmental practices or technologies. Several government agencies control environmental regulations and laws; they prepare necessary plans for environmental protections, and grant environmental relations between the concerned parties and national and international associates. Furthermore, there are a number of environmental regulations (e.g. in Europe, ELV 2000, RoHS 2003, EUP 2005, REACH 2007) and ISO certifications (9001, 14001) that force companies to reduce their use of natural resources, to reduce the amount of waste they create, and to transport their products for recycling .

ISO 14001 is the international standard that specifies requirements for an effective environmental management system (EMS). It provides a framework that an organization can follow for organizing their environmental management system in a spirit of continuous improvement, rather than establishing environmental performance requirements.

All this regulations and agencies have a vast impact on a company's decision to adopt GSCM and assist companies to run GSCM operations more efficiently.

3.2.Consumers:

Who in many cases express needs, which reinforce cost and convenience factors and demands special products and treatment.

Customers are one of the main driving forces for companies to engage in GSCM, because green practices in supply chain does matter to consumers when making decisions on intention to buy the product as well as their willingness to pay for that product.

Companies need to manage supply chains more effectively and work on greening their supply chains to meet their customer's expectations and to satisfy them.

²⁶ <https://globalscgroup.com/drivers-of-green-supply-chain/>, consulted on March, 20th, 2019, at 03:51 pm.

3.3.Organizational (or internal) stakeholders:

Who are directly related to an organization and can have a direct financial impact on it. Internal stakeholders such as top management, employees and shareholders significantly influence the implementation of GSCM initiatives by companies.

Top management's control over management system enables companies to provide appropriate technologies and resources, motivate employees, and guide shareholders to implement GSCM activities towards environmental excellence. Highly qualified and talented professional employees are able to help adopt new technologies easily and successfully.

3.4.National and international environmental NGOs :

Non-governmental organizations commonly referred to as NGOs, are a non-profit national or international organizations independent of governments and international governmental organizations -Which are rapidly growing all over the world- have a significant influence on companies' motivation to fulfill the environmental regulations and to adopt GSCM.

Regarding the environmental practices of a company, NGOs may influence consumers, companies, and governments' attitudes and behaviors in many different ways, they may provide both negative information to criticize companies' insufficiently green processes or unlawful operations and positive information to develop positive attitudes toward companies' products and services. In some cases without NGOs, substantial change is not likely to occur. (For example, a report presented by a group of Chinese NGOs describing pollution created by Apple's China-based suppliers' illegal operations raised national and global awareness and thus damaged companies and their customer's reputations and caused economic crisis).²⁷

NGOs act for the benefit of companies and contribute to the well being of society at large. Companies need to find ways to collaborate with NGOs in order to find more green solutions to ensure a positive corporate image.

²⁷ CCICED Annual General Meeting, 2011

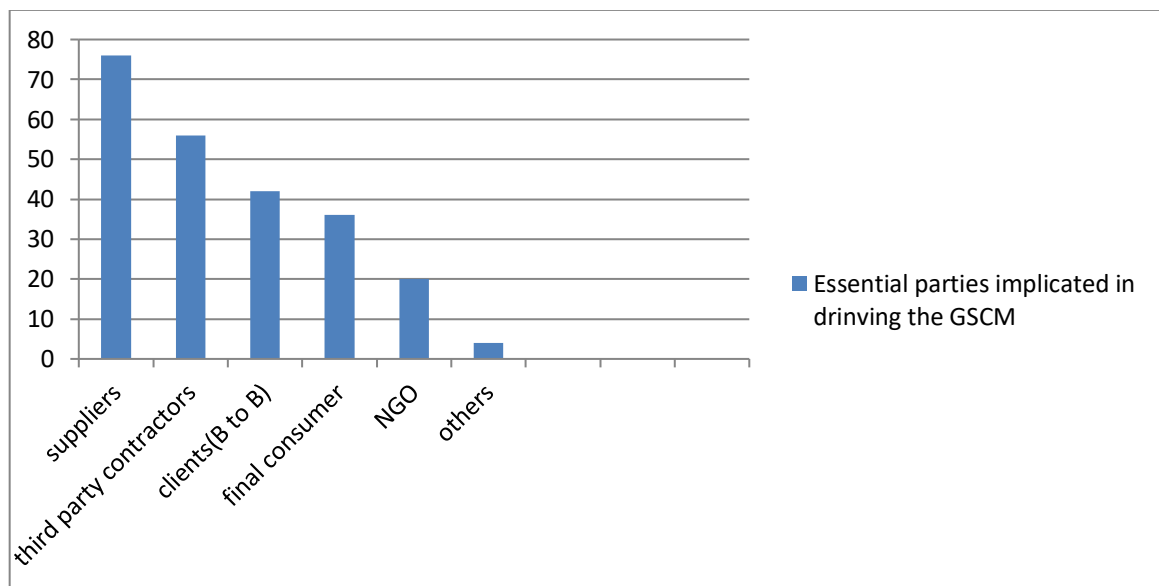
3.5. Competitors:

Today, the business environment has become more competitive than ever before, and this highly competitive global business environment encourages companies to compete through their supply chains.

Consequently, companies place greater emphasis on their environmental practices and upgrade their supply chain management to a more strategic level to comply with environmental regulations and maintain a long-term competitive advantage.

Therefore, competitors can be identified as a driver for GSCM as they are able to influence their industry's dynamics, innovation, performance and competitive advantage.

Figure n°1.7: Essential parties implicated in driving the GSC



Source: Observatoire de la Supply Chain 2008 Supply Chain verte : enjeux et maturité des entreprises, p23

The figure represents all parties with significant roles in implementing and developing the Green Supply Chain, and the degree of their impact on its course of action.

It's obvious that Third party contractors and suppliers have a higher degree of contribution as a result of their important role in the supply chain and their implication in the whole process of production, as opposed to the final consumers and the NGOs as their role is more about expressing a need and support the process of implementing greener solutions.

Conclusion of the chapter

In conclusion, at the end of this chapter, we recall that companies today tend to be more considerate to the environmental dimension in its organization and its daily management. They are becoming more environmentally conscious and aware of the impact their activities have on the environment especially their Supply chain considering it has been known to have the outmost environmental impact within a firm as a result of its importance and implication.

Integrating environmental thinking into a company's SC is a direct result of many motivations (the desire to cut costs, enhance the quality of the product, regulation, consumer pressure, gaining competitive advantage, and enhance the brand image...) and has been a source of many advantages. All these developments have significantly changed the company and starting from these rather positive adaptations, we can say that the company is becoming more and more involved in the protection of the environment that surrounds it and by doing so they're taking charge of the responsibility they have towards it. This measures adopted by the company certainly have a significant impact on the overall performance of the latter in general, but especially (what interests us) on the operational efficiency.

**Chapter 02: Key factors of
*operational efficiency***

Introduction of the chapter

All firms have come to value and aspire to reach operational efficiency but very few have come to understand how it can be designed, communicated and more importantly maintained, starting from underlining the company's most basic and strategic objectives, reaching customer satisfaction and increasing profits which all depend on operational efficiency.

As a result, it is a priority for companies to reach it and improve it, and that requires the implications of all parties concerned in order to satisfy consumer's need and reaching higher quality with minimum cost.

And therefore, in this first chapter, we will discuss the basic concepts related to operational efficiency through three sections: the first section is intended to define operational efficiency and the methods necessary in order to increase it. In the second section we will discuss the key performance indicators and their benefits. Finally, in the last section we will focus on the relationship between supply chain and operational efficiency and the more evolved concept of green supply chain's contribution towards it.

Section 01: Understanding operational efficiency

Efficiency is always referred to as the ability to produce a targeted result or reach a certain objective with minimum wastage of resources, minimum energy consumption and with fewer efforts making sure in the process that the gap between the result acquired and the result expected using the same resources is as small as possible, as a result the term operational efficiency within a firm represents its ability to achieve the best outputs using minimum inputs.

Therefore, in this first section we'll be defining operational efficiency and discussing how to achieve it and measure it

1. Definition of operational efficiency

Operational efficiency is the capability of a firm to satisfy a demand over a product or a service and be able to ensure a high quality in the process all while making sure to deliver it in the most cost- effective manner

Operational efficiency can be achieved by minimizing waste and redundancy and searching for the best ways to leverage on the resources in hand whether it's the work force, the technology ...

It is mainly attained by adapting a firm's core processes to the requirements and the continually changing market forces in the most cost effective way, resulting in reduced internal costs enabling the company to gain higher profit margins and a competitive advantage

Efficiency is largely associated with how well a relevant action is performed, i.e. "doing things right", and effectiveness with selecting the best action, i.e. "doing the right thing". Thus²⁸,

This chapter focuses on *operational efficiency*, i.e. the ability to deliver products and services cost effectively without sacrificing quality.

« **Operational Efficiency** is defined as the ratio of input utilized in carrying out a business operation to the output produced with those inputs. Inputs may be raw materials, labor,

²⁸ CHIA-YEN (Lee) and JOHNSON (L. Andrew), *Operational Efficiency*, 2012, p1.

capital...Whereas; outputs may be goods, return on investment (ROI), customer loyalty... Operational Efficiency ensures the company's capability to process, produce, and deliver goods to customers with ensured quality and support»²⁹

Efficiency is achieved by following certain steps that can be summarized in:

- Decreasing redundancy
- Avoiding wastage
- Streamlining the production process

This will not only reduce the company's expenses but make it more competitive in the market.

2. Processes to achieve operational efficiency in a supply chain:

2.1. Just in time (JIT)

2.1.1. Definition of JIT approach

That is largely known as the Toyota Production System (TPS) is an approach which aims to reduce both response and production time from suppliers and to customers, maintaining in the process low level of stock.

« Just-in-time (JIT) is a major operations management philosophy, developed in Japan in the 1980s, that is designed to achieve high-volume production using minimal amounts of inventory. This is achieved through coordination of the flow of materials so that the right parts arrive at the right place in the right quantity; hence the term just-in-time. However, JIT is much more than the coordinated movement of goods. It is an all-inclusive organizational philosophy that employs teams of workers to achieve continuous improvement in processes and organizational efficiency by eliminating all organizational waste.

Although JIT was first used in manufacturing, it has been implemented in the service sector, for example, in the food service industry. JIT has had a profound impact on the way

²⁹<https://www.mbaskool.com/business-concepts/operations-logistics-supply-chain-terms/7395-operational-efficiency.html>, consulted on April, 14th, 2019, 11:32 am.

*companies manage their operations. It is credited with helping turn many companies around and is used by companies such as Honda, Toyota, and General Motor».*³⁰

Therefore JIT can lead to the development of a production system that doesn't only meet the customer's quality and delivery time but also ensures less manufacturing costs.

*« The production system motto is to obtain or produce something only when it's needed –simply put- JIT is having WHAT is needed, just WHEN it is needed».*³¹

2.1.2. Benefits of JIT approach:

JIT has always been mistaken as just an inventory control system, whereas it is more than that, although it is capable of controlling inventory, that doesn't represent its principal function.

JIT approach has many advantages in regards of firms, among which we have:³²

- Increased use of machines and equipment.
- Reduced investment in inventory
- Improvement in the quality of product or service.
- Reduction in space requirements of the firm.
- Reduction in production cycle time
- Zero inventory storage and maintenance costs
- Closer relationship with suppliers
- Reduction in formal paper work, and higher involvement of employees as they are responsible for producing good quality goods.

Moreover, the advantages of JIT Systems are not limited to the firm in question; it represents an opportunity for suppliers also.

This approach offers a long-term guaranteed contract for supply of materials, steady and continuous demand for their materials, less expenditure on promotional activities, and timely payment of materials supplied.

³⁰ REID (R. Dan) and SANDERS (R.Nada), *Operations Management: an integrated approach*, 6th edition, John Wiley and sons.Inc, USA, 2016, p14.

³¹ HALEVI (Gideon), *Handbook of Production Management Methods*, Reed Educational and Professional Publishing Ltd, 2001, p07

³² SANDEEP (K. Seeram), *just in time manufacturing system*, 2012, p05.

2.2. Six sigma

2.2.1. Definition of six sigma:

The idea that resides behind the approach Six Sigma is that, by measuring and identifying the flaws present in a process, we can know how to systematically eliminate, correct them and go as close to perfection as possible.

It is therefore a question here of reducing the variability of a process through units of measurement.

In general, many experts have looked at the Six Sigma approach and tried to define it as accurately as possible. That's why we can, indeed, find many definitions, among which we have

« Six Sigma is a powerful method, the first to address the strategic and managerial aspects by handling the company as a whole to create a permanent chance of progress for the company» and »³³

« Six Sigma is a global approach to improve customer satisfaction»³⁴

« Six Sigma is a management discipline based on statistically verifiable facts that aims to improve business process in order to achieve sustainable profit by optimal customer satisfaction»³⁵

According to these few definitions which give a more precise vision of the approach, we can conclude the following definition: Six Sigma is a customer satisfaction focused approach that represents a method of improving quality and profitability relying on statistical control of processes; it is considered as a performance indicator that shows where the company is in terms of quality.

2.2.2. Key concepts of Six Sigma:

The principle of Six Sigma can be resumed in the elements below³⁶:

- All the processes are variable
- All variability have a cause

³³ ECKES (Georges), *Objectif Six Sigma: Révolution dans la qualité*, Pearson Edition, 2001, translated by me.

³⁴ PILLET (Maurice), *Six Sigma comment l'appliquer*, Editions d'Organisation, 2004, translated by me.

³⁵ PASCART(Emmanuel), *Six Sigma: La force du changement en période de crise !*, AFNOR, 2009, p45, translated by me.

³⁶ PASCART (Emmanuel), *Op.cit.* p47, Translated by me.

- Generally the causes are few (20% of causes = 80% of effects)
- If we know these causes, we should be able to control them

In other words, any production process, manufacturing or administrative, is unable to maintain the same level of production over time.

One of the basic principles of Six Sigma is the reduction of variability. In fact, a customer's dissatisfaction always results from a gap between an expected situation and a real situation. This difference is due in a large part to the variability of processes, which originated, in particular, from:

- Variability in materials.
- Variability in the procedures.
- Variability in the conditions in which the process evolves ...

The goal of Six Sigma is to focus the characteristics of the product sold or the service delivered around the target expected by the customer to try to deliver the best expected version.

The table below shows that at level 6 Sigma equals 3.4 defects per million opportunities (DPMO).

The weaker the sigma, the more the defects per million opportunities are important.

Table n°2.1 : Six Sigma levels

Sigma	DPMO	Efficiency (%)
6	3.4	99.9996
5.9	5.4	99.9994
5.8	8.5	9.9991
5	233	99.977
4	6200	99.38
3	67000	93.3
2	310000	69
1	690000	31

Source: PASCART(Emmanuel), Six Sigma: La force du changement en période de crise !, AFNOR, 2009

This table represents the different levels of sigma as opposed to the number of defects per million opportunity and the percentage of efficiency obtained at each sigma level.

Table n°2.2: Example of Six Sigma levels

	3.8 Sigma	6 Sigma
DPMO	10000	3.4
High quality product	99%	99.99966%
Water wastage	15minutes of water wastage per day	1 minute of water wastage per 7 months
Errors	5000 medical error per week	1.7 error per week
Missed landings	1 landing per day	1 missed landing per 5 years
Power blackouts	3 hours of power blackout per month	1 hour of power blackout per 34 years

Source: René Séon, IUT Qualité Logistique Industrielle Organisation d’Orléans, 2005

This table is an example illustrating the equivalences of Sigma based on events that may affect the daily activities and consumption of the company.

2.2.3. DMAIC : A key approach in the Six Sigma Method

DMAIC: refers to Define, Measure, Analyze, Improve, and Control.

Table n°2.3: Fundamentals of DMAIC approach

Phase	Objective	Key steps
Define	Costumer’s requirements	Collect costumers’ expressed requirements
Measure	Detect the malfunctions and problems	-quantify the costumers’ requirements -set objectives -validate the collected data
Analyze	quantify the problem	-set objectives in terms of

		operational efficiency -identify any source of variation
Improve	Develop a statistical solution	-testing potential cause for problems -Qualify causes and effects -establish solution
Control	Establish a practical solution	-validate the new data -set a process for control

Source: fulfilled by me based on BRULEBOIS (Caroline), PERRENOT (Gilbert) and SAINTVOIRIN (Bruno), 6 sigma: Le guide, AFNOR, 2009, pp35, 37

As this table shows, the DMAIC approach is a set of chronological phases for the implementation of a 6 Sigma process and the future development or improvement of this same process in the company, starting with defining customers’ requirements and needs, extracting the potential problems and quantifying them in order to find statistical solution that represents a step into finding a more practical solution.

2.3.Total Quality Management (TOM)

Due to customer’s continuant demand on higher quality regarding their products and services, the need and obligation for different companies to continually improve the quality has been raising for the purpose of gaining and upholding a competitive advantage.

There have been many definitions of quality stated by professionals among which we have:

« Quality indicates the capability of all components of an entity to satisfy the stated and implied needs, which a quality item will perform satisfactorily in service, and is suitable for its intended purpose. Quality is referred to as “fitness for use”, “fitness for purpose”, “customer satisfaction” and “conformance to the requirements.” »³⁷

And therefore quality doesn’t imply the search for perfection; it refers to the satisfaction of customers’ needs and requirements as stated.

³⁷ Dr KIRAN, *Total Quality Management: Key Concepts and Case Studies*, BS Publications, 2016, p1.

TQM aims to improve the quality of products by eliminating all sorts of cause for products defects and malfunctions and establishing quality thinking as an organizational philosophy that requires the involvement of every member in the company:

« Total quality management (TQM) consists of organization-wide efforts and an integrated system of principles, methods, and best practices to install and make a permanent climate in which an organization continuously improves its ability to deliver high-quality products and services to customers. »³⁸

TQM has become a philosophy that allows companies to stay ahead and always maintain their competitive advantage by continually searching for progress and improvement:

Practiced by some companies in the 1980s, TQM became pervasive in the 1990s and is an area of operations management that no competitive company has been able to ignore. Its importance is demonstrated by the number of companies achieving ISO 9000³⁹ certification.⁴⁰

2.3.1. Effects of applying TQM

TQM means organized change management effort with the following results⁴¹:

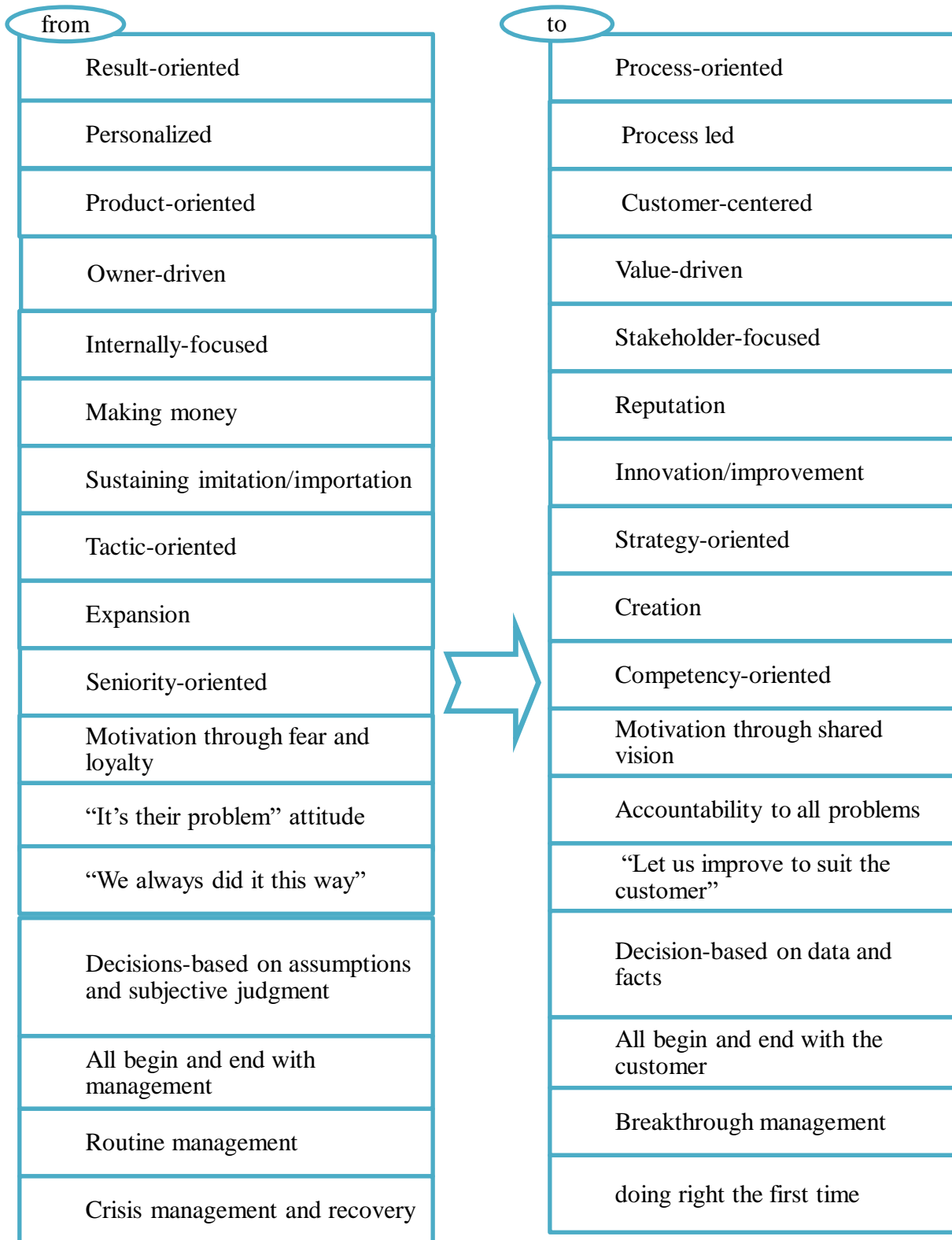
³⁸ Dr KIRAN, Op.cit. p02.

³⁹ ISO 9000 is a global set of standards developed for global manufacturers by the International Organization for Standardization (ISO), with many companies requiring their suppliers to meet the standards as a condition for obtaining contracts.

⁴⁰ Reid (R. Dan) and Sanders (R.Nada), Op.cit.

⁴¹ Dr KIRAN, Op.cit. p07.

Figure n°2.1: Effects of TQM



Source: Dr KIRAN, Total quality management: Key concepts and case studies, 2016.

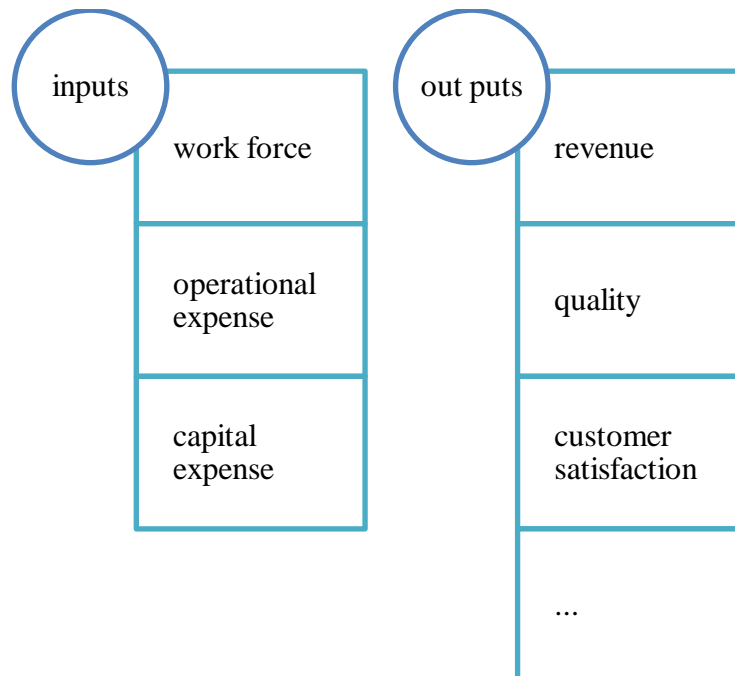
The figure represents the changes any company undergoes after implementing a TQM system whether regarding the company's management approach, decision making or the overall shared vision, which we can notice as the general approach becomes more about innovation, motivation and doing it right the first time. Moreover it became more value-driven rather than owner-driven.

3. Measuring operational efficiency

Measuring operational efficiency is the first step towards improving it, and as we've identified it earlier to be the ratio of output to input, it is a must to measure it on both sides for more precise and credible results

As a result, when measuring operational efficiency, the concerned company has to identify, measure and follow a number of performance indicators on both inputs and outputs where their definitions changes from industry to another but is largely associated with :

Figure n°2.2: Performance indicators categories



Source: fulfilled by me based on KAYDOS (Wilfred), *Operational Performance Measurement: Increasing Total Productivity*, CRC Press, 1998

4. Benchmarking and Evaluation methods:

It is well known and these examples represent the best proof that logistic benchmarking, like all benchmarking, requires known standards to make comparisons possible.

In recent years, various methods have been developed to analyze the state of logistics in a company by comparing it to others.

These models represent the most well known and used models⁴²:

- The ASLOG questionnaire
- The EVALOG reference system
- The WCL model
- The SCOR model
- The GREENSCOR model

4.1. The ASLOG questionnaire:

ASLOG (Association Française Pour La Logistique) has built a logistic benchmarking model in 1997; this model has been improved and has become responsible of determining the relevance of a logistics system and is considered a standard reference for achieving logistical excellence. The purpose of the ASLOG Logistics model is to help companies improve their logistical performance.

It is a reference of progress for companies and it is a transversal tool promoted by ASLOG, the first version of the model was product life cycle oriented with little interest in the problems occurring within the downstream flow, it has been enriched in its latest version where the concept of Supply chain has been referred to.

«It allows a company to identify its state "as is" to be able to evaluate its logistical performance, these performances are measured thanks to a rating scale ranging from 0 to 3 (0: in the absence of the minimum necessary to obtain level 1; 1, 2 and 3; 3 being the best level).

⁴² FENDER (Michel) and PIMOR (Yves): *logistique Supply Chain*, Dunod edition, Paris, 7th edition, pp109:117, translated by me.

On the basis of these characterization elements, the ASLOG auditors analyze the situation company within its supply chain and formulate a number of recommendations for future improvement "To be" »⁴³

The chapters of the ASLOG logistic reference that contains 140 questions -supply chain oriented- are as follows:

- Management, Strategy and Planning
- Design and Projects
- Procurement
- Production
- Movement
- Storage
- Sales
- Customer after sales service
- Management indicators
- Permanent Progress

4.2.The EVALOG reference system

EVALOG is a global standard tool validated by Odette and the Automotive Industry Action Group (AIAG), it is destined for automobile industry and bases is analyze on six(06) major elements among which we have:

- Client relationship
- Supplier relationship
- Production
- Product development

GLOBAL EVALOG is the result of a merger between the Odette EVALOG model and the AIAG's (Automotive Industry Action Group) Materials Management Operations Guide (MMOG) model.

⁴³ASLOG (Association française pour la Logistique) : *Le référentiel logistique de l'ASLOG : Guide de l'excellence logistique*, 2006.

It represents the binary evaluation (0 not setting up, 1 setting up) of about sixty practices and it allows the self-evaluation or the logistics audit of affiliated sites (factories, suppliers) in the form of a questionnaire.

4.3. The WCL model:

This model developed by Michigan State University⁴⁴ aims to evaluate a company's logistics based on a questionnaire of 68 questions whose responses allow to build indicators arranged according to a reference model permitting comparisons between companies

The model includes four skill areas each divided into "*abilities*":⁴⁵

- Strategic positioning: choice of strategic and structural orientations to optimize logistical operations:
 - Strategy: setting financial and commercial objectives and the choice of implantation and the means to achieve them.
 - Supply Chain: synchronization of resources through partnerships along the supply chain.
 - Infrastructure/Network: structure and distribution of physical resources.
 - Labor: structuring and involvement of workforce.

- Integration: all the means used in order to synchronize the Supply Chain :
 - Unification of the supply chain: ability to develop cooperative relations with other companies through the supply chain.
 - Information systems: investment in hardware, software and networks as well as their implementation to facilitate the processes and the exchange of information through the Supply Chain.
 - Sharing data: willingness to exchange essential data of a technical, financial, operational and strategic nature.
 - Compatibility: the ability of the company to exchange data in an appropriate, responsive and easily used format through the supply chain.

⁴⁴ ESTAMPE (Dominique), *Performance de la Supply Chain et modèles d'évaluation*, ISTE Editions, 2015, pp70:71.

⁴⁵ FENDER (Michel) and PIMOR (Yves): *logistique Supply Chain*, Dunod edition, Paris, 7th edition, p111, translated by me.

- Standardization: establishment of common and unified policies and procedures to facilitate and improve logistics operations.
 - Simplification: reengineering procedures to improve efficiency.
 - Involvement: acceptance of operational policies and procedures.
- Responsiveness: ability to maintain a balance between business performance and customer responsiveness:
- Adaptability: the ability to remain responsive to changing customer needs and reduced response times to exceptional requests from clients.
 - Flexibility: ability to adapt to the unexpected circumstances.
- Performance measurement: assessment of supply chain performance:
- Choosing internal indicators: asset management, costs, customer service, productivity and quality.
 - Evaluation of the supply chain process: implementation of indicators along the supply chain.
 - Benchmarking: comparison of measures and processes with more advanced ones.

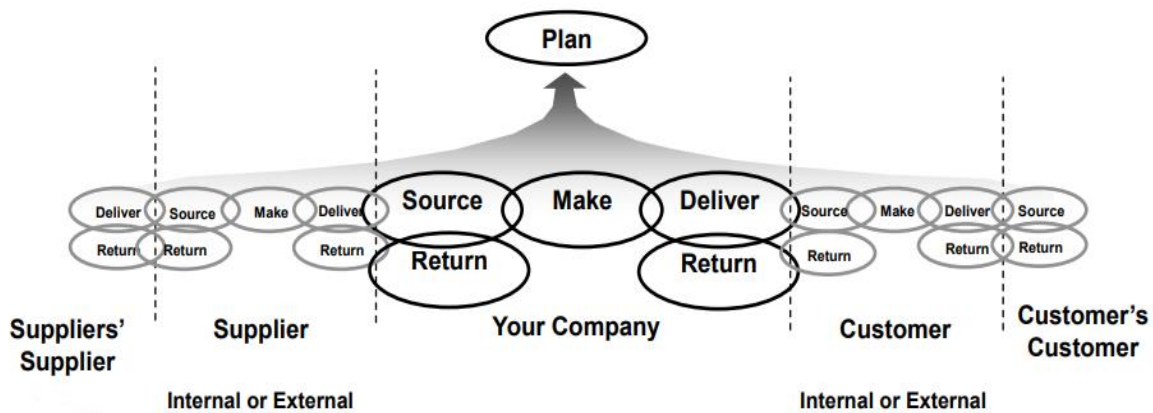
4.4.The SCOR Model:

The SCOR model ⁴⁶(Supply chain Operations Reference) is an approach that measures the level of maturity of the supply chain within the company, sets objectives and identifies differences between the current and future situation and therefore the projects that will be the main activity of the company.

The SCOR model assumes that any supply chain can be subdivided into five processes (planning, procurement, manufacturing, delivery and management of returns), based on which the five management processes that represent the core of SCOR model has been concluded (plan, source, make, deliver, return).

⁴⁶ Supply Chain Council: Supply chain operations reference (SCOR) model, Version 10.0, 2010.

Figure n°2.3: The SCOR model



Source: Supply Chain Council: Supply chain operations reference (SCOR) model, Version 10.0, 2010.

The model SCOR contains three important steps:

- Analyzing: that aims to describe the supply chain.
- Evaluation: that proposes standard performance indicators for the supply chain so it can be compared to other companies' chains.
- Improvement: that exploits good practices advocated by the SCOR model.

4.5. The GREENSCOR Model

In addition, the latest version of SCOR (SCC 2008) introduces the GREENSCOR Model⁴⁷.

This additional reference system highlights a number of good practices (set up an Environmental Management System, develop partnerships with suppliers, identify recyclable materials, and maximize loads ...). Linked with social responsibility and associated with the five processes of the SCOR model as well as environmental indicators: greenhouse gas emissions, air pollution, generated liquid waste, generated solid waste and the percentage of waste recycled.

⁴⁷Ibid.

Section 02: Key performance indicators (KPI)

Determining to what extent and in what degree the company is achieving its objectives is an important step in order to know where that company stands now and where it can go, as a result using efficient key performance indicators to determine the level of progress is essential to measure the level of success of a company or a certain activity. Therefore, in this section we'll be discussing important performance indicators and their contribution to the supply chain.

1. Concepts related to Key Performance indicator:

Traditionally, measuring performance was intended to be a tool to reduce costs, but today performance is measured based on the degree of customer satisfaction, the fulfillment of the organization's objectives and the quality of the service provided, and most importantly the based on service cost/service rate⁴⁸.

Service cost: represents all aspects and operations that contribute to obtaining the desired service rate:

- Costs related to holding inventory :
 - Product insurance, deterioration risks coverage, theft...
 - Rent and warehouse maintenance in addition to insurance.
- Costs related to the transportation and handling of the goods:
 - Proper transport and insurance of the equipment during transport.
 - Activities related to international transport, customs.
- Costs of administration and management of distribution and goods movements:
 - Inventory tracking.
 - Planning and programming of logistics operations.

Service rate: all elements that allow the delivery of the right quantity of merchandise at the right time in the required condition and with the right price.

So it involves the same elements that the service cost consists of, plus an important element which the follow-up and evaluation.

⁴⁸LAURENTIE (Jean),BERTHELEMY (François) and GREGOIRE (Laurent), *processus et méthodes logistique*, 2nd edition, AFNOR 2013, pp. 234-235

2. Supply chain performance:

In order to measure the SC performance, it is necessary to set a primary objective from which it would be possible to set secondary objectives that are adaptable to the changes necessary to today's market.

These secondary objectives are evaluated based on the value they add to the global performance of a supply chain, consequently they must conform to the ultimate objective of reaching the required quality or higher, in addition, the implementation of a performance follow-up system that will not only facilitate the search of defects but also promotes malfunctions prevention, so the three pillars of a total quality management system are upheld « *I evaluate, I correct, I prevent.* »⁴⁹

2.1. Supply chain performance indicators:

Performance indicators have many known definitions, the most used definition is « *performance indicators are a quantifiable data that measures the efficiency of part and/or a whole process of a system compared to a norm, a plan or an objective determined within the company's strategy.* »⁵⁰

Any company has multiple objectives classified within its strategy depending on its managerial, tactical or operational dimensions; these objectives require a certain number of performance indicators, making in the process an indicator system that represents « *a set of indicators, necessary and sufficient to handle the targeted actions, set in accordance with the intended system objectives.* »⁵¹

These indicators are interrelated and must be simultaneously analyzed in order to evaluate a supply chain's performance and coherence.

The most common association in-between indicators is that of subordination as the performance measured with an indicator at a certain level could contribute in the process to another indicator at a higher level.

⁴⁹Idem, p236.

⁵⁰ CERUTTI (Olivier) and GATTINO (Bruno), *indicateurs et tableaux de bord*, AFNOR gestion, 1992, p114, translated by me.

⁵¹BERRAH (Lamia), *l'indicateur de performance, concepts et applications*, cépadués Edition, 2002, p171, translated by me.

The indicator existing on a lower lever is considered global, therefore the global performance of the company is basically measured by with indicators that reflect its financial situation and her position opposed to competitors, these said indicators are situated in the strategic level and are connected to the key factors of success identified by the company.

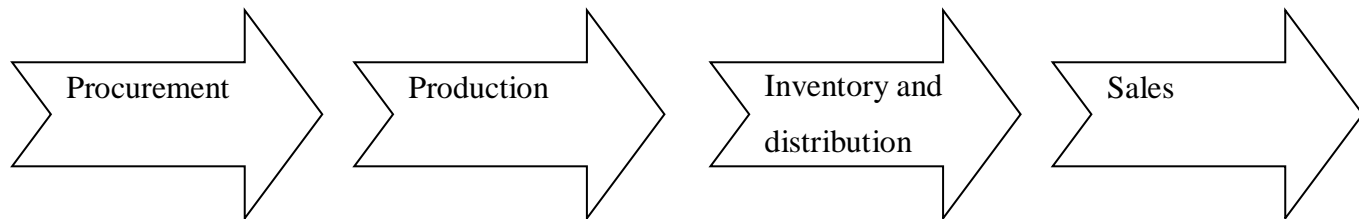
Internal performance is connected to factors measured with indicators existing on a tactical level and progress factors measured with indicators on an operational level.

Multiples types were proposed to determine a specific structure for models that have as function measuring performance, and to classify the indicators based on quality, flexibility, resource consumption and innovation, among which we can add reactivity and productivity.

These indicators allow the concerned company o manage its planning, procurement, production, delivery and sales based on which we classify these indicators to internal and external ones (client or suppliers oriented).

As a result we propose a diagram of mostly used indicators to measure Supply Chain performance:

Figure n°2.4: Mostly used SC performance indicators



Strategic	<ul style="list-style-type: none"> -Degree of Customer / Supplier relationship -Delay in product development -Cost of procurement 	<ul style="list-style-type: none"> -Profit -Total cost of production 	<ul style="list-style-type: none"> -Offer flexibility in order to adapt to the costumers' requirements. -Perceived product added value. -Deadline for order placement.
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Tactical	<ul style="list-style-type: none"> -Deadline for a purchase order. -Savings achieved thanks to Supplier Initiatives. -Suppliers' performance. -Suppliers' delivery time. 	<ul style="list-style-type: none"> -Production time -Production flexibility. -Production plans' performance 	<ul style="list-style-type: none"> -Delivery plans' precision -Percentage of finished products in transit. 	<ul style="list-style-type: none"> -sales forecast precision. -Suppliers' response time.
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Operational	<ul style="list-style-type: none"> -Efficiency of purchase -Order cycle time. 	<ul style="list-style-type: none"> -Resources consumption rate. -Inventory levels. 	<ul style="list-style-type: none"> -Quality of delivery. -Distribution errors' rate.
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Source: (F-A) GRUAT LA FORME_CHRETIEN : *référentiel d'évaluation de la performance d'une chaîne logistique*, thèse pour l'obtention de garde de docteur en génie informatique, l'institut national des sciences appliquées de Lyon 2007, p40.

This figure represents the most used performance indicators in a supply chain classified within three dimensions (operational, tactical and strategic), and in every stage of the chain, starting with procurement until sales.

It contains aligned and interconnected indicators with the purpose of analyzing and measuring the performance of every function within the supply chain

2.2.Characteristics of effective key performance indicators:

There are many characteristics linked to performance indicators, all too often authors use the SMART rule as means of identifying the characteristics⁵²:

- Specific: the indicator must be clear, précis, well defined and focused toward a performance target or business purpose.
- Measurable: the indicator must be quantifiable and measurable.
- Achievable: the indicator must be reasonable and shows if the targeted objectives can be attained.
- Relevant: the indicator must be directly pertinent to the work done on the project.
- Time-based: the indicator must set a specific time lapse for the objectives to be attained so it would be measurable on a specific time period.

Supply Chain Performance Indicators are extremely linked to this function's objectives and that of the company's, however there's also a certain number of descriptive indicators that are considered functional such the number of delivery points, level of inventory ...where some are considered useful to measure.

2.3.Performance indicators families

Based on the model SCOR, performance indicators are classified within two major categories⁵³: customer-oriented values and internal values:

- Customer-oriented values: this category contains multiple elements, from which we have:

⁵² KERZNER (Harold), *Project Management Metrics, KPIs, and Dashboards: A Guide to Measuring and monitoring project performance*, John Wiley & Sons, 2nd edition, 2013

⁵³ FENDER (Michel) and PIMOR (Yves), Op. cit, pp217, 218, translated by me.

- OTIF (On Time, In Full): State of transportation, quality of production, rate of machine malfunctions and the service provided by the supply base...;
 - Deliveries rate (picking and packing) and backorders rate
 - Efficiency and adaptability facing change in demand (safety stock levels);
 - Flexibility faced unexpected situations (the number of generic solutions offered to customers...);
 - Damaged products delivery rate.
- Internal values :

Is composed of other two major indicators categories: technical and financial

- Technical :
 - Reliability of stocks in the sense of quality of information in databases versus physical data
 - Number of references in stock shortage (quality of forecasts, quality of inventory location planning in the different distribution centers)
 - Quality of key data (information entered into systems)
 - Reliability of forecasts (level of collaboration between marketing, sales and logistics functions, level of integration and automation of information systems to trace sales data.
 - Unscheduled machine shutdown rate (maintenance)
 - Productivity of operations per person (motivation, training and skills of people, level of activity, quality of management ...)
 - Flexibility of the production (tool change time ... etc.)
 - Size of production and delivery supply batches (level of flexibility of equipment used, etc.)
- Financial :

It involves active indicators and cost indicators:

- Active indicators :
 - Inventory values (inventory levels)
 - Stock rotation
 - Return on investment of the concerned assets
- Cost indicators:

- Supply Chain cost (quality of service required, choice of solutions mobilized to manage the activity's fluctuation...)
- Cost of each primary operation (productivity and unit cost)
- Cost of sales

2.4. Performance indicators categories:

There are four major categories⁵⁴ based upon which performance indicators are classed:

- Activity indicators: that represent indicators measuring processed volumes, physical and information flow: production, stock level, volumes transported, number of receptions, number of shipments, number of inventory movements , number of references managed ...
- Productivity indicators: These are the indicators linked to machine use and resources consumption rate (manufacturing, transport, processing, and labor in general).
- Quality indicators: They allow the evaluation of services: level of customer service, percentage of late delivery, percentage of non-conformities in the deliveries, percentage of customer complaints ...
- Cost indicators: that represents costs associated with manufacturing, storage, distribution, transportation, treatment...

Section 03: SCM and operational efficiency

The principal performance standard of a supply chain within an organization is its efficiency, that is to say the comparison between the effort and resources allocated to a process and its result, to determine if that process is in fact using the most appropriate practices and exploiting in the best possible way the available resources.

The ultimate purpose of a supply chain would be to improve margins and productivity, reaching customer satisfaction, reducing operating costs and leading to expansion, and doing so by focusing on the best outcome and external standards.

Choosing the most appropriate and beneficial strategy in order to deliver a product or a service to the last customer requires the optimization of order processing, strategic planning and reverse logistics techniques with minimum costs.

⁵⁴ LAURENTIE (Jean), BERTHELEMY (François) and GREGOIRE (Laurent), Op.cit. P 336.

Supply chain efficiency is basically about harnessing in the most profitable way possible the resources (financial, human or technological) available in hand.

Supply chain managers are under pressure and facing multiple issues affecting operational efficiency, in addition to suppliers and stakeholders who can be seen as change agents and are in fact playing an extremely important role in enhancing operational efficiency

1. Improving supplier relationship management

SRM is a discipline that enables the organization to plan and manage strategically its interactions with its suppliers for the sole purpose of harnessing as much value as possible of these interactions. SRM helps the organization to create and develop a set of collaborative and beneficial relationships with key third party organization responsible of supplying the concerned company with goods and/or services to achieve higher goals with fewer risks.

A well-executed SRM approach can provide competitive advantage, fuel growth and brand development, reduce cost, improve efficiency and effectiveness and reduce supply side risk or at least help understand it so it can be mitigated. However, SRM is not something that can simply be 'bolted on'; it is an organization-wide philosophy that needs to be embraced by all if it is to deliver these benefits.⁵⁵

1.1.Three pillars of SRM

SRM has three interrelated components that must be joined together in order to establish an effective and operating SRM system that not only helps support sourcing but also promotes the need to satisfy costumers and strategic planning.

As for any structure, all the pillars are necessary to make it whole and functional. The pillars of SRM are what, with whom and how⁵⁶:

- What: determining what value or benefits the organization needs to realize from its supply base in order to realize strategic goals.
- With whom: determining which suppliers the organizations needs or wants a relationship or some sort of intervention with through detailed segmentation.

⁵⁵ O'BRIEN (Jonathan), *Supplier Relationship Management: Unlocking the hidden value in your supply base*, Kogan Page Limited, 2014, p38.

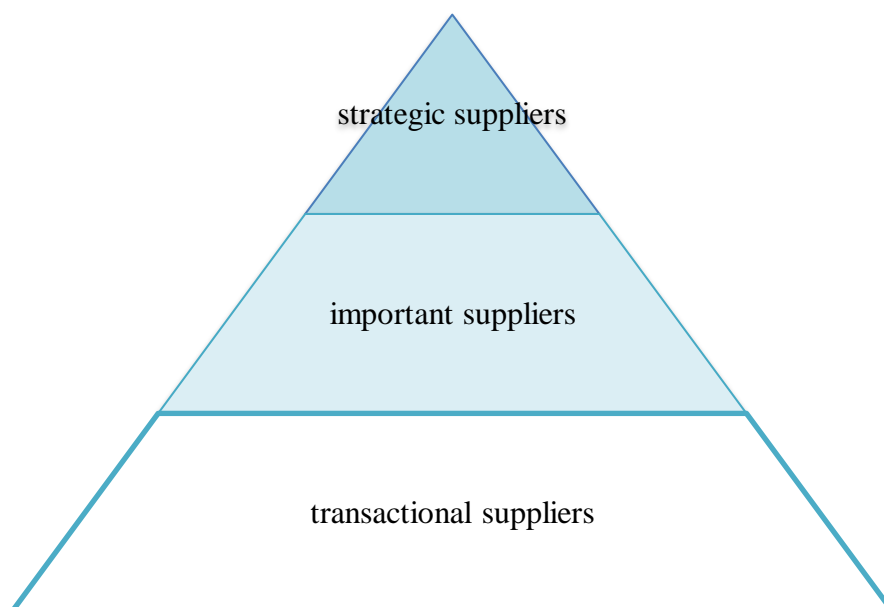
⁵⁶ Ibid, p48

Supplier segmentation is considered to be the division of the supply base in order to help the organization determine and set in action the type of relationship or intervention appropriate for each one and beneficial for the concerned parties.

There are three major classifications used in order to divide the supply base into segments, this simple supplier segmentation model provides a starting point to classify our different suppliers according to how important they are to us. There are three broad classifications. These are:

- Transactional suppliers: that represents the suppliers with whom there's no need for special intervention or additional follow-ups but merely the simple and immediate transaction would be enough.
- Important suppliers: that represents suppliers who require a certain degree of special intervention and management for more benefits and /or it is required to.
- Strategic suppliers: that represent suppliers who offer great amount of benefits therefore it is essential to establish a close relationship as a result of the great and critical strategic importance they represent and the opportunity they offer to further protect and develop the business, realize mutual organizational goals and achieve greater value together.

Figure n°2.5: The Suppliers Segmentation Pyramid



Source: fulfilled by me based on O'BRIEN (Jonathan), *Supplier Relationship Management: Unlocking the hidden value in your supply base*, 2014, p48.

- How: determining which specific interventions the organization is willing or needs to deploy with its supply base in order to achieve its strategic goals and how.

1.2.Values achieved with SRM

SRM can offer many benefits if implemented, some of which are associated with the degree of work and focus the company is willing to make, in order to expect the following results⁵⁷:

- *Increasing efficiency:*

As a result of the growing understanding the supply base has of their client's business ultimate goals due to beneficial and improved streams of communications, which allows them to identify, face and eliminate any possible problem or risk susceptible to arise in an efficient manner.

Due to the continuant flow of information, the supply base are more flexible and willing to adapt to the needs more quickly eliminating in the process all sorts of redundancy throughout the streamlined process .

- *Growth in revenue:*

Which represent an advantage for both suppliers and buyers that can be reached through mutual involvement in the improvement of their relationship, whether is through a joint venture or closed collaborations, the concerned parties can use their relationship to penetrate new markets and gain further Oppurtunities while sharing the potential risk and/or growth.

- *Saving costs:*

SRM helps establish ground to reduce future risks and by doing so avoiding unnecessary or additional expenses concerning quality and delivery, by concentrating on establishing and developing long term relationships. These improved relationships and increased interactions play a major role in decreasing the amount of incidents or poor performance which represents a key factor in saving costs.

- *Continual improvement:*

⁵⁷ <https://sipmm.edu.sg/key-strategies-build-effective-supplier-relationship-management/>, consulted on April, 17th, 2019, at 03:55 pm.

These long term relationships based on mutual benefits provide multiple opportunities for both parties to engage in a process of continual improvement of products and services provided through product development, enhancement of procedures and through the use and development of KPIs over the course of the transaction in hand.

Moreover, by adopting an approach that allows buyers to ensure that their demands are met by suppliers who continue to improve in order to ensure customer satisfaction, and ensure in the process the respect of contractual performance.

➤ *Preferred buyer status:*

The process of changing suppliers is both time and money consuming, as it will require intense search and involvement of internal resources to find suitable suppliers and then start the process of negotiations.

The relationship built with the long term supplier provides clearer visibility and understanding of costs and generates in fact more value.

1.3. The challenges of implementing SRM

Even with the benefits SRM offer many companies hesitate to implement it as a result of the following challenges⁵⁸:

- The complicated and hard change in management and the shift in perspective that managing suppliers requires from both sides in order for it to function properly.
- The amount of responsibility it contain as a result of the time it requires and the fact that many departments still believe in the traditional manner of managing suppliers.

Supplier relationship management is an effective approach that enables the concerned parties to collaborate, improve continually, eliminating SC risks and improving services by ensuring a beneficial and consistent manner of interacting and managing the supply base.

⁵⁸ <https://sipmm.edu.sg/key-strategies-build-effective-supplier-relationship-management/>, consulted at April, 17th, 2019, at 04:15 pm.

2. Monitoring procurement:

Effectively monitoring procurement in a highly important aspect within the management of an organization and therefore requires a high level of attention to ensure its integrity and compliance to the rules, laws and ethical standards.

Conducting effective and continuous process of control is the first step in order to achieve transparency and accountability, and by doing so we make sure that all resources are accounted for and used in the most effective way possible for the organization to continue its activity.

Procurement activities are monitored by keeping track of the necessary updates and the actual dates of completion for the various activities; a sound monitoring process for example will help in the procurement process and give planners the opportunity to take corrective measures to ease future procurement work.⁵⁹ In order to do so, it is required to develop a compliance checklist to determine if procurement procedures are being followed to the point. The checklist should be designed with collaboration from all parties involved in the supply chain. By participating in the development of the checklist, they are essentially being trained and have greater awareness of the process. A good compliance checklist reinforces existing procedures and translates the objectives of fairness, openness and competition.⁶⁰

3. Green supply chain and operational efficiency:

It is common thinking that greening the supply chain by starting with practices such as banning chemical substance usages, reducing or reusing waste could be enough but that is merely a start. When considering GSCM, it is essential to understand that it is applied to all departments and in all aspects of processes within a company so its benefits are not confined to just limiting the environmental impact.

When talking about operational efficiency, there are multiple studies that established the fact that GSCM offers many advantages, among which:

⁵⁹ RIBIERO (Joseph Martial), Procurement of Goods, Works and Services in Development Projects, Presses Internationales Polytechnique, 2011.

⁶⁰ <https://bizfluent.com/how-7501850-monitor-evaluate-procurement-procedures.html>, consulted on April, 16th, 2019, at 03:00 pm.

- Sustainability and efficient use of resources.
- As opposed to the common thinking that greening the supply chain costs more, it is in fact a way to reduce expenses and increase efficiency.
- Product differentiation and having a competitive advantage in comparison with other companies in the same industry
- Compliance to regulation and important reduction in risks
- Gaining in terms of brand image and reputation
- Increased and enhanced quality of products with minimum cost
- Increasing employee morals and ethical compliance
- Important and fast return on investment
- Minimizing wastage and decreasing the use of harmful materials reaching in the process a cleaner and more efficient production

Therefore greening the supply chain doesn't only guarantee minimum environmental impact that has become an extremely relevant issue considering the damage the traditional supply chain is reflecting to the environment, but also it improves the operational efficiency within an organization as well as its image and profitability.

Conclusion of the chapter

In conclusion, we have come to understand that putting factors such as the customer's satisfaction, search for higher quality, optimizing production, minimizing or reusing waste and limiting the use of resources and energy consumption along with other important factors are in fact a measurable way in order to achieve and maintain operational efficiency.

And we have come to understand that such factors are of significant importance in order to establish competitive advantage, that's why today's companies take more into account the environmental dimension by greening its supply chain.

All these developments represent a significant change and shows important differences between companies in the past and companies today.

Starting from these rather positive adaptations, we can then say that firms are becoming more and more involved in the protection of the environment that surrounds them.

Implementing a Green supply chain by adopting a more environmental approach certainly have an impact on the overall performance of the latter in general, but especially (what interests us) on its operational efficiency.

Chapter 3: Green Supply
Chain Management's role in
improving operational
efficiency at Unilever Algeria

Introduction of the chapter

In recent years, customer satisfaction has become a breaking point and a critical factor to differentiate and set aside a successful business from rather a less profitable one, and considering the enormous changes the fast moving consumer goods market (FMCG) is facing especially in the Algerian market that has been experiencing a growing instability facing import restrictions.

In order to survive, companies are faced with challenges related to sustaining the business and are therefore committed to taking strategic and tactical decisions, particularly its supply chain. In fact, supply chain management has become a key element for companies today, and the issues involved in optimizing the supply chain are numerous and often have a direct impact on company performance.

And for the purpose of optimizing the supply chain and keeping some fundamental values of environmental consciousness at one of the leaders in the FMCG industry –Unilever-, measures were taken, having as a result the implementation of Green Supply Chain Management.

And therefore, in this chapter, we will discuss the impact that implementing a GSCM in Unilever Algeria had on its operational efficiency through sections: the first section is intended to present the multinational giant –Unilever- and its subsidiary in Algeria. Finally, in the last section we will focus on analyzing the results obtained from interviews conducted with managers at Unilever in order to further comprehend the GSCM related practices used within the company and its impact on the environment, and on the company's operational efficiency.

Section01: The company presentation –Unilever-

1. Unilever

Unilever is a British-Dutch transnational consumer goods company co-headquartered in London (United Kingdom) and Rotterdam (Netherlands), the company is present in more than a hundred country and their products are sold in more than 190 countries with a turnover of more than 51 billion Euros in 2018 considering that the group was ranked as leader in terms of ice cream and tea production with no less than 300 production sites; it was considered the world's fourth largest fast moving consumer goods (FMCG) company slightly after Nestlé, PepsiCo and Coca-Cola.

The company classifies its products within 4 categories:

- Beverages and ice cream: Ben & Jerry's, Miko (Magnum, Carte d'Or, Max Adventures, Viennetta, Cornetto), Lipton...
- Food: Amora, Calvé, Knorr, Maille, Maïzena...
- Personal-care: Axe, Brut, Dove, Monsavon, Rexona, Signal, Timotei, Williams...
- Homecare: Buhler, Cajoline, Cif, Domestos, Omo, Skip, Persil, Sun...

They are the world leaders in food industry when it comes to the categories in which they operate: broths, condiments, teas and ice creams... They are also world leaders in skin care products and deodorants in addition to maintaining a strong position in other categories of home care and personal care products.

Unilever is dedicated to meeting the everyday needs of consumers all around the world; their Foods and Home & Personal care products offer and deliver a promise of quality; that's why On any given day, 2.5 billion people use Unilever products to feel good, look good and get more out of life, giving the company a unique opportunity to build a brighter future.⁶¹

⁶¹ <https://www.unilever.com/>, official Unilever website, consulted on March, 22nd, 2019, at 04:22pm.

1.1. Unilever's history:

Unilever is a business based on a sense of purpose with a simple and clear vision of “making sustainable living commonplace”.

On January 1st, 1930 the company was founded as a result of the merger between the Dutch margarine company Margarine Unie (created by the LEVERD family) and the British manufacturing company Lever Brothers (founded by William Hesketh Lever), forming one of the first multinational consumer goods companies in order to help import large quantities of common raw materials.

For more than a century, Unilever has been able to adapt to changes and developments occurring in the industry and the world, and since the end of the 19th century which marked a simple beginning of a company touched by history (wars, progress of science, economic progress, etc.). In a record time Unilever has been able to mark its presence and take a place among its rivals having a reputation for being socially and environmentally responsible.

Today, the company is still convinced that economic success requires respect for employees, consumers and the various companies with whom it operates.⁶²

It has initiated or participated in a large number of initiatives to find sustainable resources, protect the environment, and support local communities and more.⁶³

- In 2018, more than 58% of their turnover came from emerging countries.
- 12 brands have sales of more than €1 billion a year.
- The company employs more than 161,000 people.
- 47% of their managers are women
- In 2017, they have been able to maintain a zero non-hazardous waste to landfill.
- No.1 FMCG graduate employer of choice in 44 of the 52 countries the company recruits from
- In 2017 their Sustainable Living brands grew 50% faster than the rest of the business
- 127 million people were reached through their Lifebuoy program for promoting hand washing and 49 million through their program of promoting brushing teeth, between 2010 and 2012.
- 100% of their palm oil purchases in 2012 were from sustainable sources.

⁶² <https://www.unilever.com/about/who-we-are/our-history/#timeline+3D+515804+open>, consulted on March 24th, 2019, at 10:14pm.

⁶³ <https://www.unilever.com/about/who-we-are/about-Unilever/>, consulted on March 25th, 2019, at 11:35am.

- 39% of their tea comes from sustainable certified sources by the Rainforest Alliance.
- Since 2010, they have reduced their environmental footprint by 6%.

1.2.Unilever's vision

Unilever's vision⁶⁴ of further expanding and growing their business is realized based on the company's operational expertise and distinct purpose, allowing them to further accomplish their goal of increasing their rather positive social impact and reducing their environmental footprint as it is well explained in the Unilever Sustainable Living Plan (USLP).

The company's vision of establishing a set of strong relationships in emerging markets in order to make a strong base for growth is planned by combining the diverse and multinational knowledge and set of expertise with their already existing roots in different and multiple cultures in order to maintain their activity of providing a rich range of products.

In addition to the company's goal of making a big difference in the world by leveraging their global reach and inspiring people to take small, everyday actions.

The company's vision has set the foundation for multiple priorities and principles defining their commitment and way of running their activity. Amongst which we have:

- Establishing a better future for children by :
 - Launching initiatives that promote the necessity of making the future better for generations to come such as the Child Vitality initiative to bring our expertise in nutrition to children in some of the world's poorest countries by partnering up with the World Food Program.
- Providing a healthier future by :
 - Vaseline has launched the Vaseline healing project , providing research into skin conditions and support for people affected by skin diseases.
- Promoting a more confident future by:
 - For example the Dove's Campaign for Real Beauty uses real women instead of models in its advertising campaigns. The brand has also launched the Dove Self Esteem Fund which educates and inspires millions of young women.

⁶⁴ <https://www.unilever.com/about/who-we-are/our-vision/>, consulted on April 2nd, 2019, at 12:45pm.

- Providing a better future for the planet by:
 - Aiming to grow the business while reducing their environmental footprint and working across the supply chain for every brand to do so (the laundry brands, such as Surf, OMO, Persil and Comfort, have launched the Cleaner Planet Plan together, encouraging consumers to change their laundry habits to reduce water and energy consumption).
- Proving a better future for farmers and farming by:
 - Using ethically and sustainably sourced ingredients that are independently certified.

1.3. Unilever's involvement in global challenges

Growing a business on the expense of the environment and the people represent an impossible and unacceptable line to cross for the company, not to mention that it's socially and commercially unsustainable for the business.

As a multinational, Unilever has always intended to play a role in solving global environmental and social problems. Therefore, the company has developed a sustainable development plan named USLP (Unilever Sustainable Living Plan)⁶⁵ as a model for business in order to set the rules and establish all the ways possible to maintain business growth while reducing the environmental footprint.

The USLP is based on three major objectives:

- Help more than a billion people to improve their health and wellbeing.
- Halve the environmental footprint of the products
 - Greenhouse Gases: Halve the greenhouse gas (GHG) impact of the products across their lifecycle by 2030.
 - Water: Halve the water associated with the consumer use of the company's products by 2020.

⁶⁵Appendix n°3.1.

- Waste: halve the waste associated with the disposal of Unilever products by 2020, and providing 500 million people with safe drinking water to prevent dangerous diseases such as diarrhea.
 - Sustainable sourcing: By 2020, 100% of agricultural raw materials will come from sustainable agriculture.
- Source 100% of the agricultural raw materials sustainably and enhance the livelihoods of people across the value chain.⁶⁶

1.4. Research and development

Innovation allows the company to respond, in the most up to date and modern way possible, to the needs and aspirations of individuals, allowing it in the process to make small but efficient improvements as well as big ideas that meet the needs of consumers.

Therefore, Innovation is at the heart of Unilever's ambition to grow sustainably. Science, technology and product development are central to their plans to keep providing consumers with great brands that improve their lives while having a positive impact on the environment and society.

The company focuses on R&D (Research and Development), by combining their acquired scientific expertise along the years with consumer knowledge to produce attractive and exciting technologies.

Unilever is equipped with 6 major R & D laboratories in the world: two in the United Kingdom (Colworth House and Port Sunlight), one in the Netherlands (Vlaardingen), one in the USA (Trumbull), one in China (Shanghai) and one in India (Bangalore), with more than 6,000 scientists, engineers, chefs and technicians work around the globe in order to invent new products and improve existing products to delight consumers everywhere.⁶⁷

1.5. Unilever's Customer Relationships Management

Unilever is constantly developing its knowledge of the links between providing consumers with food and their well-being, searching for and developing its ways of producing

⁶⁶ <https://www.unilever.com/sustainable-living/>, consulted on April 2nd, 2019, 14:11pm.

⁶⁷ <https://www.unilever.com/about/innovation/>, consulted on April 3rd, 2019, 09:53am.

food that have a positive impact on health and thus improve hygiene and increase consumer satisfaction.

With leading brands, the Group offers quality products every day to 2.5 billion consumers around the world when it comes to food, home care and personal care.⁶⁸ And it mobilizes all its energy to adapt to new trends and technologies and satisfy different and emerging consumer needs. It is therefore a matter of creating value in order to continue to grow the business while enhancing customer satisfaction, because at Unilever, Health, nutrition and pleasure guides and sets the standards to follow, as the company is considered a leader in its markets with famous brands and a reputation to uphold.

As a result to the costumers' continuant and evolving demands regarding food and products used in daily lives, Unilever is always looking for ways to respond based on its employees' innovation and creativity.

1.5.1. Food category

Unilever has one of the largest portfolios of food brands. The popularity of its brands is the result of a daily and continuant analyze of consumers feedback and respect for their desires.

We can notice that the Group has ranges of products that make it possible to find all tastes on all occasions, from the most everyday to the most festive. Thanks to its research center, « the Unilever Health Institute» that sets up numerous research programs that constantly improve the nutritional qualities of its products.⁶⁹

1.5.2. Home care and personal care categories

Its personal care brands are used on five continents. And brands like Ax, Dove, Signal, Lux, Lifebuoy and Rexona have a goal of exceeding the expectations associated to them being merely hygiene products, and reach an objective of enabling the user to better enjoy life.

Unilever possesses 15 major historical brands of home care and personal care. Continually evolving, these brands bring consumers the latest innovations in practicality, efficiency and wellbeing.⁷⁰

⁶⁸ <https://www.unilever.com/about/who-we-are/about-Unilever/>, consulted on April 9th, 2019, 05:32pm.

⁶⁹ <https://www.unilever.com/brands/?category=408118>, consulted on March 9th, 2019, at 06:01pm.

⁷⁰ <https://www.unilever.com/brands/?category=408126>, consulted on March 9th, 2019, at 06:10pm.

1.6. Values and principles

The company's Purpose states that to succeed requires "the highest standards of corporate behavior towards everyone they work with, the communities they touch, and the environment on which they have an impact."

Their values define how they do business and interact with other colleagues, partners, customers and consumers. Their four core values are integrity, responsibility, respect and pioneering. As Unilever expands into new markets, recruits new talent and faces new challenges, these values guide them in decision making and in the actions they take every day. Therefore, the organization seeks to have a positive impact through: its brands, its activities, its commercial relations, its voluntary contributions as well as any other means.

On one hand, it is constantly seeking to improve its environmental impact.

In Algeria for example, its industrial site is certified and has established processes to reduce the consumption of water, energy and as well as waste that has been reduced to date to 60%.

The company is committed to working with suppliers, agents, distributors and other business partners who share similar values and uphold the same standards as they do. Their Responsible Sourcing Policy and Responsible Business Partner Policy, aligned to Unilever's Code of Business Principles⁷¹, seek to uphold twelve fundamental principles covering business integrity including specific responsibilities relating to employees, consumers and the environment.⁷²

2. Unilever Algeria

Unilever Global is subdivided into three geographical regions; and Algeria is part of Unilever Maghreb, which in turn is part of the MENA region (Middle East & North Africa), the only representative of the North African subsidiary.

Unilever Maghreb holds production sites in the three countries: Morocco, Algeria and Tunisia. The investment in Algeria started in 1954, starting with the most famous and trusted brand in the region -powder soap OMO- and this investment was a result of a partnership with a local

⁷¹ Appendix n°3.2.

⁷² <https://www.unilever.com/about/who-we-are/our-values-and-principles/>, consulted on April 10th, 2019, at 08:42pm.

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distributor, since then, OMO has become the reference brand of this type of soap in the country.

Unilever decided to officially enter the country in 2002 with a production site located in Oran in the Hassi Bounif industrial zone.

The site started by providing customers mainly with detergents: OMO (hand and machine) and Surf, but the since then their activity has expanded.

All activities related to Marketing, Supply and Demand planning for locally processed products, as well as imported ones, in based in Algiers (ABC tour, Pins Maritimes Mohammadia).⁷³

The products distributed in Algeria by the group:

⁷³ Unilever Algeria's internal Data obtained from Human Resources Department.

Table n°3.1: List of products distributed in Algeria

Categories	Sub-Categories	Type	Brand
Home care	Detergent	Laundry detergent	OMO
		Multi use	JIF Surf
Personal care	Hair care	Shampoo	Dove
		Conditioner	Clear Sunsilk
	Skin cleansing	Soap shower Gel	LUX, Dove
		Deodorant	Rexona Axe Dove
		Stick	Rexona Dove
Oral	Tooth paste Toothbrush	Signal	
Food			Knorr
	Refreshments		Lipton

Source: fulfilled by me based on data obtained from Marketing department

2.1.Unilever's expansion plan in Algeria :

Unilever's expansion plan in Algeria came into being in September 2018, coinciding with import restrictions and laws because of the country's economic situation which has somehow limited and impacted significantly the course of business.

On one side, by limiting the importation of products already registered in the list of imports and on the other side, there was the obstacle of the prohibition of adding new materials or unregistered products.

Not to mention the serious devaluation of the value of the Algerian dinar.

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Despite these serious obstacles, Unilever Algeria's activity on national territory has remarkably evolved as a result of installation of new lines –mainly in the “Personal Care” category- which are operational since September 2018 namely:

- A production line of shampoo and conditioner for the brands Sunsilk, Clear and Dove as well as the LUX and Dove shower gel.
- Another line that produces SIGNAL toothpaste.
- And a new line for the production of liquid detergent.

Currently only LUX and DOVE brand soaps are imported.

The sales process within the subsidiary prioritizes certain activities over others and in order to achieve the objectives defined by the responsible teams; certain measures are taken, some of which we mention:

- **Growth through Core of the Core**: concentrate on selling and making the best of products that provide high unit profit margin.
- **Safety stocks**: ensure products availability in order to cover current demand.
- **Accelerate distribution**: focus on all the ways that can accelerate distribution to ensure that goals set are being achieved.
- **BB Awareness**: present and go through all possible scenarios to be able to cover the gaps. Therefore a continuant need for creativity.⁷⁴

2.2.The organizational structure of Unilever Algeria:

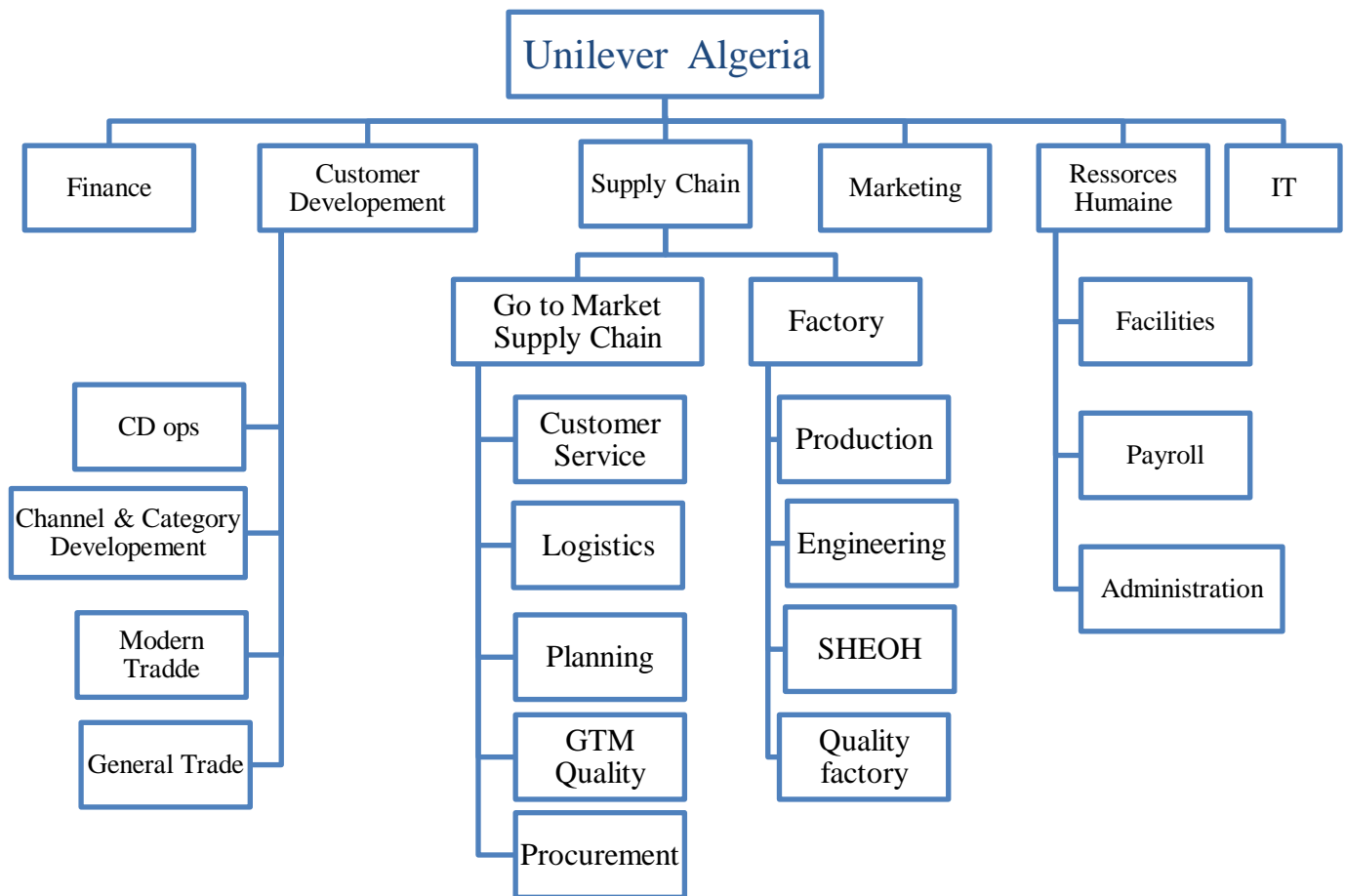
Unilever in Algeria is subdivided into 5 major departments directly dependent on the parent subsidiary Unilever Maghreb.⁷⁵

The figure below presents in detail the organizational chart in Algeria:

⁷⁴ Unilever Algeria's internal Data obtained from Human Resources Department.

⁷⁵ Unilever Algeria's internal Data obtained from Human Resources Department.

Figure n°3.1: The organizational chart of Unilever Algeria



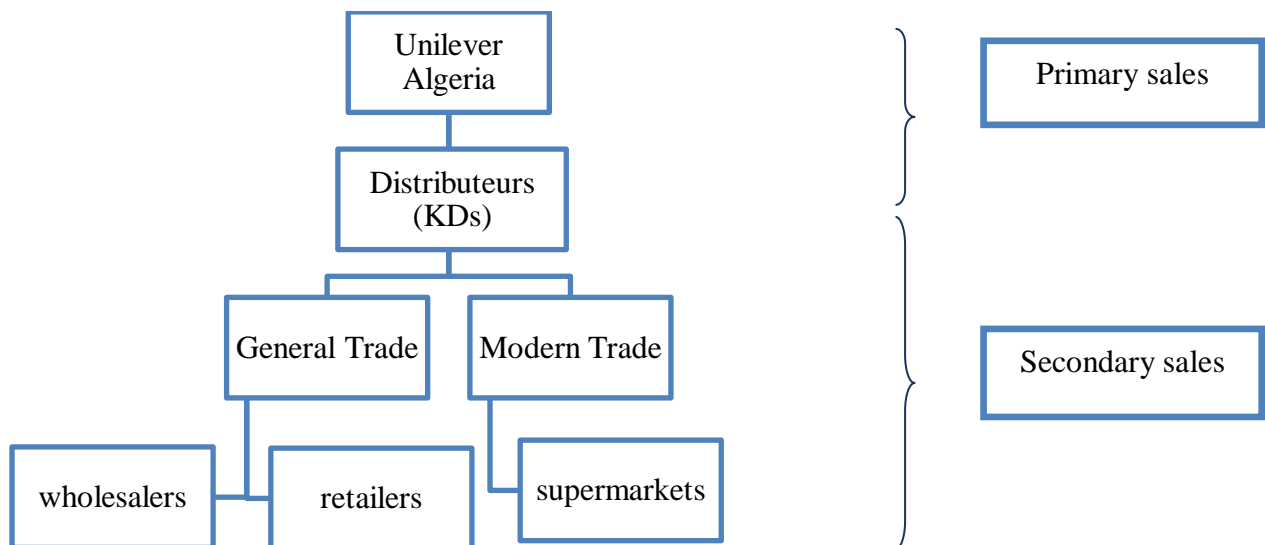
Source: company's internal DATA acquired from Human Resources department

2.3. Distribution Channel at Unilever Algeria :

Unilever's current distribution strategy is all about selection, at this phase, choosing the best distributors with the ability to cover most of the country geographically to ensure maximum coverage on one side.

On the other side, dealing with the most efficient and stable distributors to obtain the targeted brand image and by doing so the company get to position itself strategically in the market.

Figure n°3.2: Unilever Algeria's distribution channel



Source: fulfilled by me based on data acquired from supply chain process control department

The circuit is divided into two:

2.3.1. Primary sales:

The current number of distributors is approximately 27 located and organized according to major Algerian geographical regions (West, West Center, East Center, East, Far East), which are in turn divided into zones and then into sectors and geographical areas.

2.3.2. Secondary sales:

- General Trade (Traditional Trade): Represents 97% of Unilever's turnover, it includes distribution to wholesalers, semi-wholesalers and retailers.

For further details, 72% represents the contribution of wholesalers, which is clearly the majority compared to retailers with 25%.

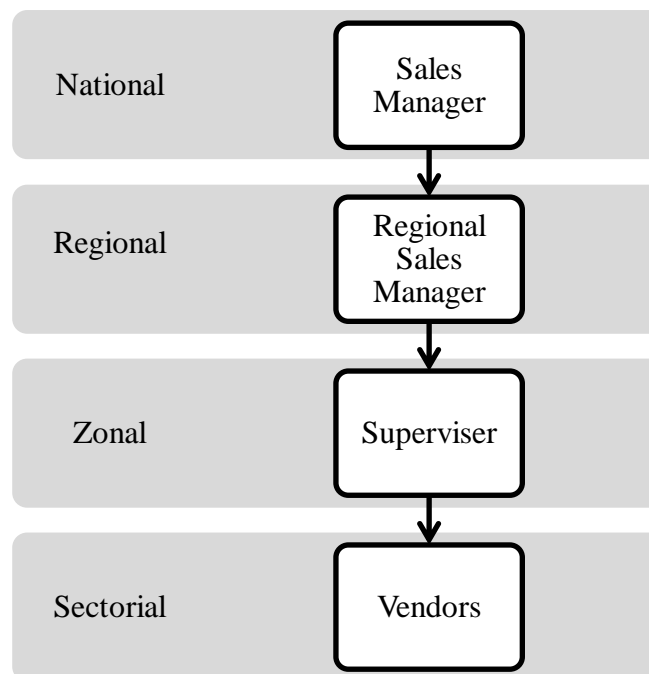
- Modern Trade: Includes distribution to supermarkets (Ardis, Uno, Family Shop ... etc.). This channel accounts for almost 3% of Unilever's turnover, which compared to

other channels of distribution is extremely poor, this situation is a result of existing Algerian consumer culture and the current state of the Algerian market.

Distributors, wholesalers and retailers together form Unilever's customer portfolio, which is handled by Customer Development Department, with the purpose of optimizing sales and distribution at both primary and secondary levels.⁷⁶

This department is organized as follow:

Figure n°3.3: Organizational chart of CDD



Source: fulfilled by me based on data acquired from supply chain department.

2.4. Different departments and their functions

The manufacturing site in Oran is divided into four (04) large departments.⁷⁷

2.4.1. IT Department

⁷⁶ Internal DATA obtained from supply chain department.

⁷⁷ Internal DATA obtained from Human Resources Department.

Concerns all the technologies and especially those of the offices, this department manages the computers necessary for the work, network management as well as repairing any breakdowns.

2.4.2. HR Department

This department contains two separate parts, the first one handles human resources. Including:

- Recruitment and training of employees, as well as their follow-up and Evaluation.
- Training planning and organization (availability of rooms, needs, supplies, etc.).
- Administration: work certificates, pay slips, etc. As well as updating available employee data.
- Management of access rights: programming of badges.
- Payrolls' management: sign-in, absences (authorizations), holidays, retirements, resignations, subcontractors, etc.

As for the second part, it is the Workplace & Travel service whose tasks are summarized in:

- Facilities: order the office supplies, housing, and transport.
- Provide any means necessary for employees in order to accomplish every task in hand: phones, computers.
- Employee welfare: living space, water supply, fruit, coffee and tea.
- Launching of the projects: Layout of workspace.
- Event Management: hotel, ticketing, pick-up and meals.
- Managing mails: reception and sending (national and international).

2.4.3. Finance Department

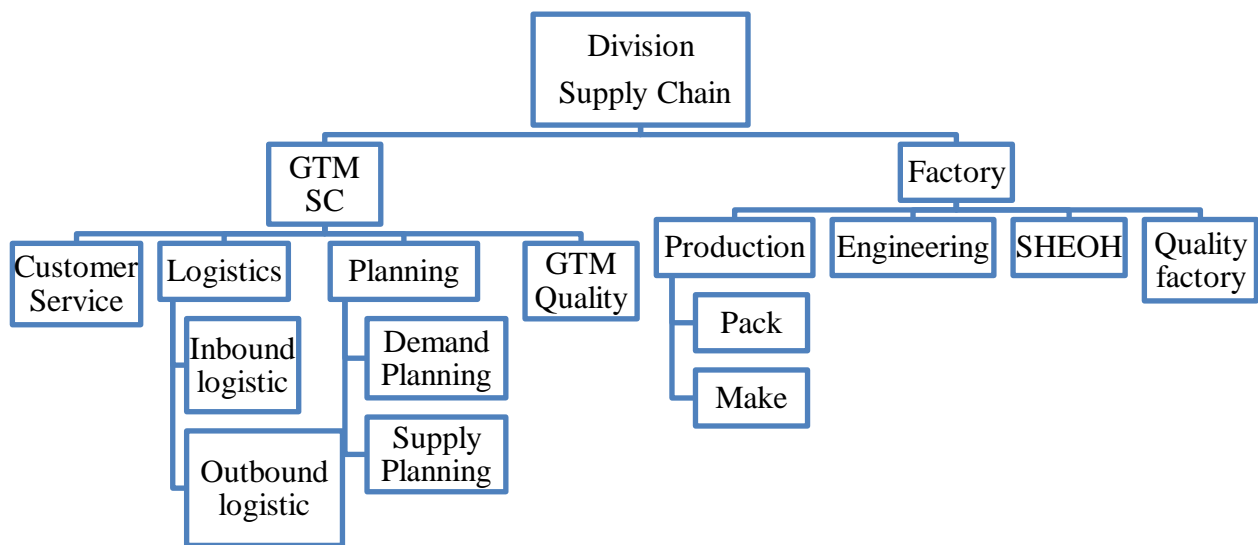
Finance has some of the company's vital missions, including which there are:

- Accounting.
- Taxes and reporting.
- Treasury.
- Budget management.
- Taxation.
- Sales.

2.4.4. Supply Chain Department

Unilever owns one of the most efficient logistics chain in its sector (FMCG) which focuses on efficiency and eco-production in steering these processes.

Figure n°3.4: SC Division's organizational chart



Source: company's internal data obtained from supply chain department.

The Supply Chain division is managed by a Supply Chain Manager and includes two departments, which are Factory and GTM (Go to Market) Supply Chain, whose job is to ensure both the production and the good distribution of the products.

This department is considered the largest in terms of number of services and employees, the two departments of the division perform critical functions that affect significantly the course of business, it groups together the functions:⁷⁸

2.4.4.1. GTM Supply Chain:

⁷⁸ Internal DATA obtained from supply chain Department.

This department ensures the management of information and physical flows ensuring in the process the proper functioning of the entire logistics chain and optimizing its efficiency and effectiveness.

It groups together the following services:

- Customer Service:

It is considered to be the service that handles customer relationship processing (KDs) and therefore the processing of the sales order. In addition, they monitor primary sales, from order taking to delivery to KD.

They also check the availability of requested products, process customer complaints and track payments.

The Customer Service also ensures primary customers' satisfaction by handling and verifying the proper completion of the order in terms of quantity and delivery time.

- Logistics:

This department is grouped in 2 parts:

- **Inbound logistics:** this service is in charge of the flow of inputs and thus of the transportation of raw material to factories and the products imported to the various local warehouses, it also takes care of the procedures and formalities with the Algerian customs and the bank (Customs clearance, payment method ... etc).
- **Outbound logistics:** This service handles Unilever's finished product, and therefore the output flow transportation to distributors.

The company has three warehouses of finished products (C201) including two main warehouses: one in Oran (C001) where raw material is stored and another in Algiers (C002). Transportation and Ware House Management activities are outsourced to local stakeholders; this decision was taken to allow Unilever to focus on its core business of production and sales.

- Planning:

This service is grouped into 2 parts:

- Demand planning: handled by the supply chain manager of Unilever Algeria, the demand planner is primarily responsible for forecasting sales over a 2-year horizon and secondly for organizing and regulating order flows, forecasting sales and participation in the development of the monthly production plan.

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One of the principal missions of the demand planner is to set up production and sales schedules and to carry out monitoring, for the purpose of optimizing the deadlines, maximizing the use of means of production, and cutting costs.

The demand planner has other missions critical for business activity; among which:

- Scheduling and adjusting in coordination with other services and departments.
- Deadlines management.
- Participation in the optimization of production processes.
- Monitoring essential material supply to guarantee a smooth course of production.

These entire tasks allow the Demand Planning Manager to have a more or less optimal vision of the future activity of the company.

Therefore there are certain characteristics that the Demand Planner needs to have in order to perform his job at best, as a result, the Manger is required to:

- Be organized and attentive to the work environment.
- Possess quick decisions making abilities in case of problems.
- Have the ability to k manage delays.
- Have a good sense of communication.
 - Supply planning: This service ensures the availability of finished products to meet demand, and also calculates raw material needs and the launch and follow-up of orders.

- GTM Quality:

The main mission of the GTM quality manager is to ensure that Unilever products reach the final consumer in good quality by verifying its compliance with quality procedures, Unilever's quality requirements, all process documentation and updates, the service consumer, but also the quality controls on the site.

2.4.4.2.SC Factory:

This department brings together all the functions ensuring production at the Oran plant level. It is divided into four sub-departments, which are:

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- Production: this service ensures the processing and transformation of raw materials into finished products; it is divided into two teams:

- Making: Includes all the production lines, it is planned according to a PIC (Industrial and Commercial Plan) drawn up to achieve the goals set by Unilever World for each region where it operates.
- Packing: Includes packaging, bottling, crating and palletizing.

- Quality factory: Includes activities that ensure compliance with Unilever's general standards and quality standards within the plant, including the company's QMS, quality control and quality audit.

- SHEOH: responsible for the company's security policy and ensures that it's applied and monitored. It concerns the workforce, equipments, working conditions, respect for the environment, and prevents the risk of accidents and diseases.

Safety, Hygiene and Environment, these three services ensure that the company operates under the required standards. It includes employee safety, monitoring, but also the control of disposals, water and energy consumption as well as the carbon footprint of the company.

- Engineering: this service groups maintenance activities within the plant.

Section 02: Effects of GSCM on operational efficiency at Unilever Algeria

The assessment of the overall impact of GSCM related practices on the operational efficiency of Unilever Algeria has presented many challenges; the difficulty lies in the fact that the access to information was an enormous obstacle. Thus the choice of the analysis tool seemed extremely limited.

For this reason, we initially chose to interview a number of managers within "Unilever", in the three departments that seemed best related to our study -supply chain, HSE and quality- therefore, we have been able to talk to the Health, Safety and Environment department Manager, the MCO Algeria Quality assistant manager and the Supply Chain process Control, claims & pallets management specialist.

It is only appropriate to mention that due to distance obstacles, the interviews with the HSE department Manager and the MCO Algeria Quality assistant Manager were through a video call using **Skype**.

1. Methodology of the Study:

In order to maximize the use of the information available and answer the main research question, as we recall, «What is the impact of implementing GSCM on operational efficiency? », we have seen it best fitting to conduct a qualitative study through interviews with the managers concerned.

At first hand, it is suitable to start with presenting the methodology followed within this research, then a summary of the results gathered with a detailed analysis of each response, and finally a general summary followed by a conclusion.

1.1. Choice of research methodology

Considering the nature of this research, it was required to collect necessary information through observation, and in order to enrich the research it seemed proper to use a Qualitative Study that requires intensive analysis, allowing us in the process to gather the necessary information based on answers provided by managers at Unilever Algeria containing their opinions, point of views and facts extracted based on their experience and activity in the company.

This study aims essentially to highlight which of the GSCM practices that are largely used within the company and therefore to provide some insight on the impact of such actions.

1.2. Tools used to collect information

There are multiple techniques used within the qualitative study in order to collect the information required for a research, amongst which the mostly used techniques are: Individual interviews, group interviews, projective techniques, creative techniques and observation techniques.

Based on the objective set in accordance with this research and the position held by the interviewees within Unilever Algeria, it seemed more fitting to carry out individual interviews.

This specific technique has three main types: the non-directive interview, the semi-directive interview and the directive interview.

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As the research required versatile information, we opted for the semi-directive interviews, as a result of the resilience and controlled freedom it offers to the interviewees, and thus allows to deepen the field of answers.⁷⁹

Table n°3.2: Interviewees' presentation

Name	Job description	Interview duration
Mr. Abdelkader ARAR	HSE Manager	48 Minutes
Mr. Hichem SOUISSI	MCO Algeria Quality assistant manager	39 Minutes
Mrs. Fatma Hakima KOUBA	Supply Chain process Control, claims & pallets management specialist	42 Minutes

Source: Fulfilled by me based on DATA provided by the interviewees

The questions asked during the interview are intended to gather as much information as possible. We specifically wanted to reach a conclusion containing a real estimation of the impact that followed the implementation of GSCM on the operational efficiency of Unilever Algeria.

Therefore, we'll start with analyzing the most relevant replies giving by the interviewees in response for the questions asked.

The answers will be divided into three parts depending on the three departments each interviewee covered.

2. Presentation and analysis of the interview's results

2.1. Supply Chain part

⁷⁹ VERNETTE (Éric), Techniques d'études de marché, Vuibert, 4th Edition, 2018, pp 31,38.

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The questions in this part were addressed to Mrs. Fatma Hakima KOUBA, supply chain process control, claims and pallets management specialist, in the purpose of further understanding the major GSCM related practices employed in Unilever Algeria's supply chain and their effects of this chain and course of activity.

The most relevant questions are:

1. To what extent do you think the company is committed to limiting its environmental impact?

« Unilever takes the environment and sustainability as a priority in its aims and it has launched several programs to minimize our operations' impact on the environment in order to reach our goal of cutting our environmental footprint by half by 2030.

We consider that our waste reduction has an impact on the whole value chain, from sourcing our raw materials to within our own manufacturing and operations. That's why we aim to source our raw materials sustainably from suppliers who share our vision. »⁸⁰

The need to play a part in tackling climate change and reducing the depletion of natural resources -especially considering their financial and environmental impact- are one of the reasons for which Unilever has shown a great interest in limiting its negative footprint and in incorporating environmental thinking into its activity which is a pillar for a GSC.

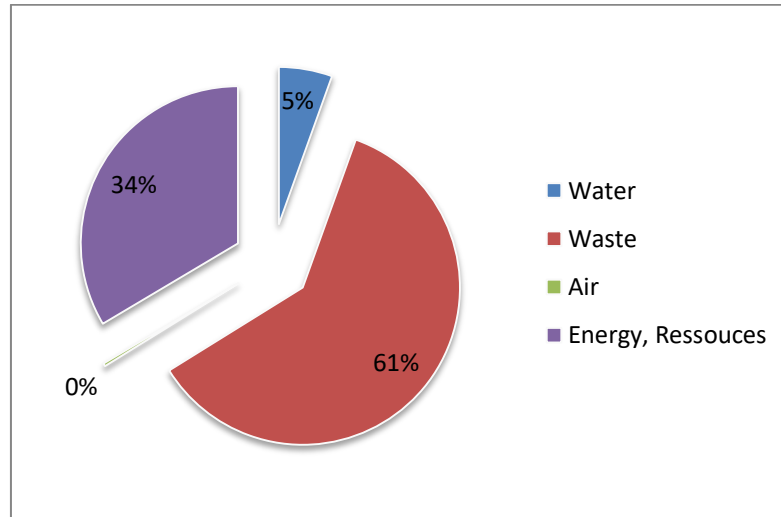
Table n°3.3: Losses related to environmental degradation in Algeria

Factor	Percentage on annual PIB (%)
Water (poorly served areas)	0,18
Waste (neglected recycling potential)	1,99
Air (untapped energy source)	0,01
Energy, resources (poor resource management)	1,10
Total	3,28

Source: MATE, 2016, p65.

⁸⁰ KOUBA (F. Hakima), supply chain process control, claims and pallets management specialist at Unilever Algeria, May 14th, 2019.

Figure n°3.5: Losses related to environmental degradation in Algeria



Source: fulfilled by me based on table n°3.3, using Excel.

The figure represents the losses related to the environment that Algeria has been facing, mainly as a result of negligence and poor management; these losses were one of the reasons for which Unilever considered GSCM.

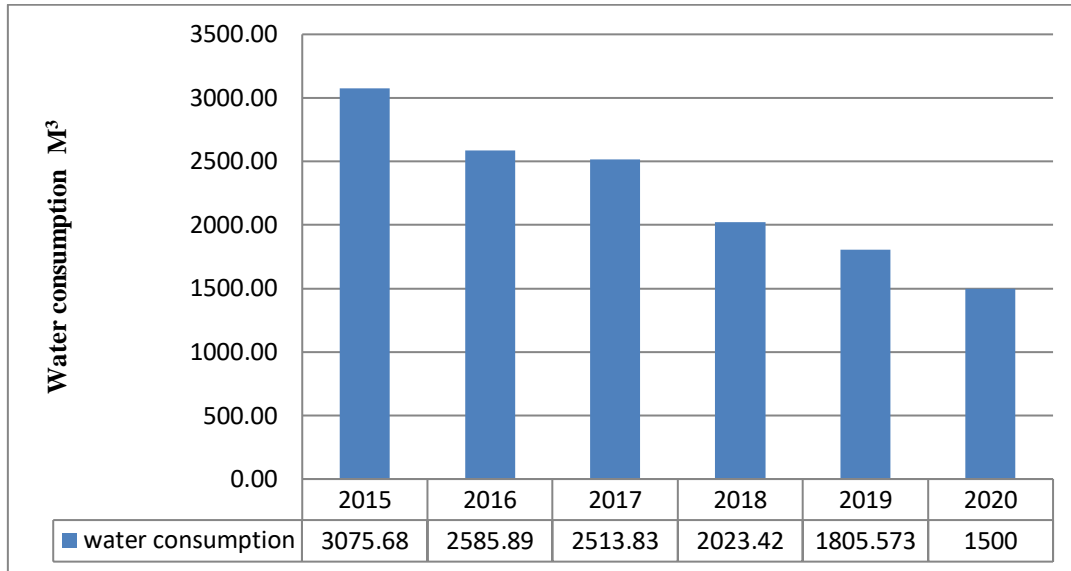
In order to do that several programs have been established but the most recent and efficient one is *Unilever sustainable living plan* (USLP) that aims to increase business growth while decreasing the negative environmental effects, and further accentuate Unilever's commitment and involvement in sustainability.

The main focus of this plan concerning the environmental aspect would be to reduce water consumption, waste reduction and sustainable & responsible sourcing from suppliers who respect the standards delivered by Unilever.

Selection is based on the number and location of suppliers; moreover the supplier sourcing criteria is a part of Unilever's approach towards respecting their ISO 14001 certification.

Therefore suppliers are obliged to conform to the level of standards dictated by Unilever's environmental policy whether it comes to sourcing raw material or to the disposal of unwanted waste.

Figure n°3.6: Water consumption at Unilever Algeria

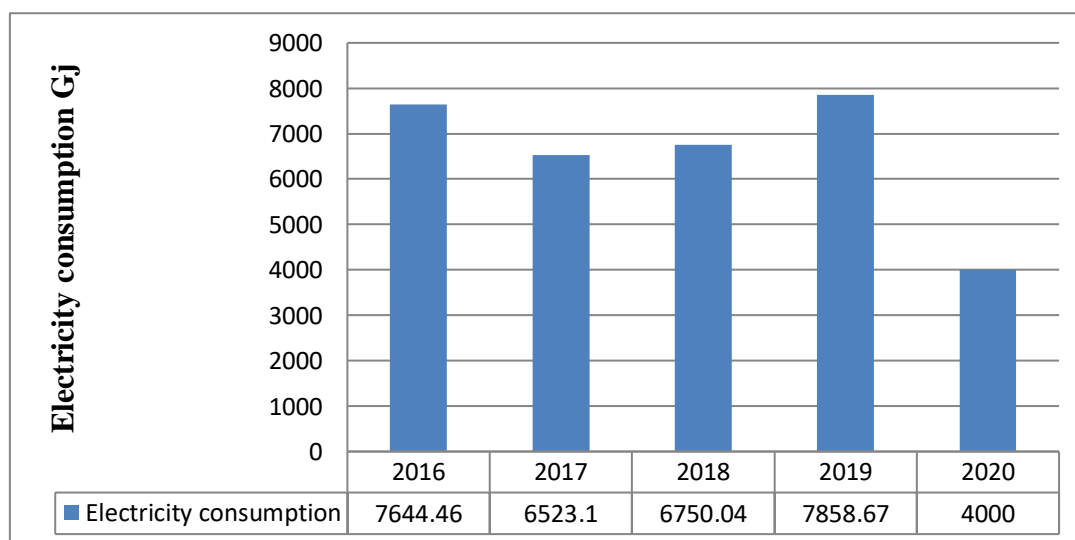


Source: Unilever Algeria's internal DATA, obtained from Supply Chain department.

This figure accentuates Unilever Algeria's interest in one of the pillars of its USLP, which is reducing water consumption, as we can notice through the years; they have been able to reduce water consumption in their production process through creating a closed circle where the majority of water is recovered and reused after treatment.

The company's goal by 2020 is to halve their water consumption.

Figure n°3.7: Energy consumption at Unilever Algeria



Source: Unilever Algeria's internal DATA, supply chain department.

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This figure represents Unilever’s electricity consumption from 2015 until their consumption targets at 2020, the consumption reduction process has shown real progress between 2015 and 2018 where it was reduced by 11%, but has continued to grow as a result of the implementation of new projects and adopting more automated procedures during production, storage and packaging⁸¹.

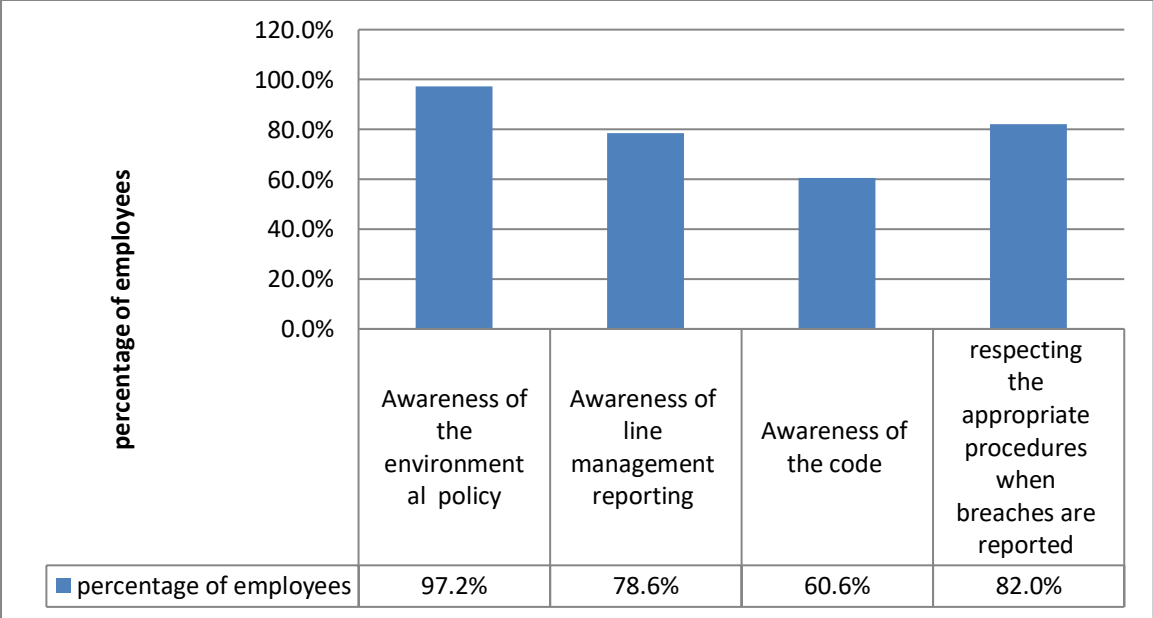
Unilever has as a target to halve its energy consumption by 2020.

2. How does that affect its course of activity?

« These programs are not disturbing its activities; on the contrary, they are making them more organized and purpose oriented. »⁸²

As contrary to common believes that implementing a GSC wouldn’t be worth the effort due to the degree of implication and coordination it requires, we can conclude that these practices have in fact advantages that would make them worth to be considered and applied.

Figure n°3.8: Employees’ environmental awareness survey



Source: Unilever’s internal DATA, Human Resources Department

⁸¹ Appendix n°3.5.

⁸² KOUBA (F. Hakima), supply chain process control, claims and pallets management specialist at Unilever Algeria, May 14th, 2019.

A survey was conducted in 2016 to measure the degree of implication of the company's employees towards the environmental policy and their awareness of the standards and procedures to follow.

Amongst approximately 500 employees, 60% have proved to be aware of Unilever's business code while 82% shown their awareness of the importance of respecting the appropriate procedures followed in case of a breach.

And finally 97% of employees are in fact aware of the company's environmental policy. This shows their involvement and motivation into adopting greener activities.

3. Can you explain your department's role in the process of waste management?

- *We are respecting all processes related to waste segregation.*
- *Arranging "raise awareness" tours to our 3PL team about the importance of waste management and sustainability.*
- *A workshop was created specifically for pallet repair, with 0 DZD worth of investment; more than a third of the damaged pallets are recovered.*⁸³

We can conclude the degree of implication each department has in terms of respecting the practices, and when it comes to SC control process, waste management takes a huge part as a result of its importance; as a result certain steps are taken starting with:

- Supervising the process of waste segregation that involves:
 - Assessing the Waste Management needs.
 - Waste collection and processing.
 - Determining the waste to be recycled and the waste destined for disposal.

Alongside with supporting suppliers to improve their quality (through Supplier Audit, quality contracts, Sampling Plans, Qualification and Evaluation...).

The 3PL that are handling the disposal of waste are obliged to respect the procedures dictated by Unilever's policy that has minimum negative environmental effect.

⁸³ KOUBA (F. Hakima), supply chain process control, claims and pallets management specialist at Unilever Algeria, May 14th, 2019.

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As a result it has been considered as an accomplishment at Unilever Algeria, the operation of creating a workshop for repairing or recycling pallets with no related investment cost.⁸⁴

4. What are the measures taken in order to repair and re-use damaged pallets?

« We have a team that specializes in pallets reparation at Oran level, so the pallet is re-used but when the reparation is not possible (pallet very damaged and can't be re-used) we use their wood on other pallets' reparation. »⁸⁵

We conclude that, decreasing waste disposal, saving space and conserving natural resources are in fact a priority at Unilever, which shows in the measures taken in order to manage efficiently the generated waste.

Unilever's commitment to adopting the 4R's approach regarding the use of pallets necessary through the whole SC is shown distinctively by:

- Reducing the use of pallets by optimizing the number of units carried.

This particular aspect is coordinated with the marketing department, as the department concerned with products packaging design, they try to Design packaging that helps avoid or reduce the use of too much pallets during transportation.

- Re-using undamaged pallets -after optimizing the collection process (reverse logistics): by optimizing scheduling in order to minimize empty rides-
- Recycling damaged pallets by using them as raw materials in order to repair or manufacture other pallets.

Unilever has been committed in a significant number of green practices, besides the 4Rs), they are committed to green purchasing, the use of non-hazardous materials.

These practices allowed the company to:

- reduce, in this way, its water consumption by 2/3, which is equivalent to a reduction in the water bill of about 2/3,
- enhancing its image as environmentally conscious company,

⁸⁴ Appendix n° 3.6.

⁸⁵ KOUBA (F. Hakima), supply chain process control, claims and pallets management specialist at Unilever Algeria, May 14th, 2019.

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- gaining costumers' loyalty and the improvement of customer and public relations,
- Waste reduction, and therefore costs,
- Improving environmental performance.

5. When facing storage-space shortage, what are the actions taken in order to optimize the use of that space?

« In this case we have two possibilities. First we can do what we call REPLENISHMENT, it means transfer products between our two warehouses (from the full to the empty).

When the first operation is not possible (our two warehouses are full) we convert to the second solution which is to rent a 3rd warehouse (an overflow) just for the period when we have storage space issue. »⁸⁶

It is important to mention that one of Unilever's methods in order to optimize storage space is using High Density Storage System (HDSS): a system that optimizes the use of warehouse space by automating the operation of pallet transfer.

This rack and pallet storage system automatically moves the pallet inside the rack. The shuttle is a "robot" moving in an accumulating rack structure. In this case, the carriage does not enter the structure. But simply places the pallet on the level concerned, the shuttle does the rest, allowing the driver to focus on pallets transfer.

Table n° 3.4: HDSS advantages

Financial advantages	Environmental advantages
- Enables the use of the FIFO management system which corresponds to Unilever's products type.	- Reducing CO2 emissions produced by diesel trucks through the use of electric trolleys and the use of electrical energy.
- Maximum storage density (4 floors, 33 lanes and 31 pallets per lane)	- Reducing CO2 emissions produced by transfers between warehouses. Little transfer

⁸⁶ KOUBA (F. Hakima), supply chain process control, claims and pallets management specialist at Unilever Algeria, May 14th, 2019.

<ul style="list-style-type: none"> - Capacity increase from 1254 to 4600 pallets - Allows to manage a reference by corridor (33 corridors) - Reduced logistics costs - Reduced handling risks - Decrease the manual interventions, and thus better maintain the quality of the product and its packaging. - Preserve the condition of wooden pallets during storage. 	<p>required with this system.</p> <ul style="list-style-type: none"> - Reducing waste resulting from non-conforming products through optimal inventory management. - Use of recyclable materials.
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Source: Fulfilled by me based on internal data provided by supply chain department.

The adopted supply chain strategy is the "Make to Stock" depending on forecasts. That is, a production-driven "push" approach. For this reason, the Oran site is often faced with a problem of overstocking which the company faces by two actions

- Replenishment.
- Using an Overflow.

6. What impact does all this measures have on the company's performance?

There are multiple benefits

- *Saving cost* (through adapting the 4R's approach)
- *Respecting the environment.*
- *Implementing a new culture inside warehouse.*
- *Avoid out of control material handling costs.*
- *Increase of efficiency.*

...⁸⁷

Depending on the previous answer, we conclude that adopting critical GSCM practices exceeds just environmental advantages, even though this aspect is the core of GSCM especially considering the numerous benefits it has from:

- Spreading awareness amongst suppliers willing to work with the company.

⁸⁷ KOUBA (F. Hakima), supply chain process control, claims and pallets management specialist at Unilever Algeria, May 14th, 2019.

- Reducing the environmental footprint.

To other financial benefits

- Lowering waste disposal costs;
- Lowering waste treatment costs;
- Lowering energy costs;
- Savings on materials and supplies;
- A reduction in regulatory compliance costs;
- Lowering storage costs;
- Cost recovery through the sale and use of recyclable materials.

2.2.HSE part

This part was addressed to Mr. Abdelkader ARAR, as the HSE Manager, he has been able to answer our questions regarding the major GSCM related practices used in his department in order to reduce the environmental negative footprint; and the most relevant effects of these practices.

7. What are the factors that need to be considered when making the HSE performance monthly report?

The activity takes into account 8 factors:

- *Risk Assessment procedure;*
- *Evaluation procedure for environmental aspects;*
- *Energy management procedure;*
- *Waste management procedure;*
- *Noise measurement procedure;*
- *Notification procedure for accidents and serious incidents;*
- *Communication procedure;*
- *Follow-up sheet.*⁸⁸

⁸⁸ ARAR (Abdelkader), HSE Manager at Unilever Algeria, May 12th, 2019.

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The HSE department submits a monthly report with the purpose of assessing the site's activity and these instructions apply to all operations of Unilever Algeria.

The requirements of these reports conform to the standards present in the Unilever Standard-Environment sustainability policy⁸⁹; Managers establish a monthly report containing:

- Production: product ranges (in ton / month).
- Utilities: water, gas, electricity
- Effluents
- Sounds (complaints and objectives)
- Incidents and accidents that have an impact on the environment, safety and health of staff.
- Near miss
- Costs and savings

All of these factors represent the indicators necessary in order to assess and measure the impact of the company's activity on its performance, efficiency, and on the environment.

Using these indicators represents a crucial step towards decreasing the negative footprint and enhancing operational efficiency as a result for their importance as adaptable key performance indicators.

8. Can you explain your department's policies in terms of waste management?

« As WCM site & in terms of waste management, we have a policy that has as a goal ensuring Sustainable Growth while reducing our Environmental Impact & contributing to Unilever's Sustainability Living Plan (USLP)

In addition to reducing generated Waste, Achieve & maintain Zero Waste to Landfill.»⁹⁰

“Making sustainable living a commonplace”, is Unilever's policy and philosophy. In this sense, Unilever Algeria has been involved in a waste management policy since 2011, with a goal of "Zero Waste Landfill"⁹¹, we will cite below the main actions carried out by the HSE department to achieve this goal, and we will see the results in the following figure:

- 2011 waste segregation.

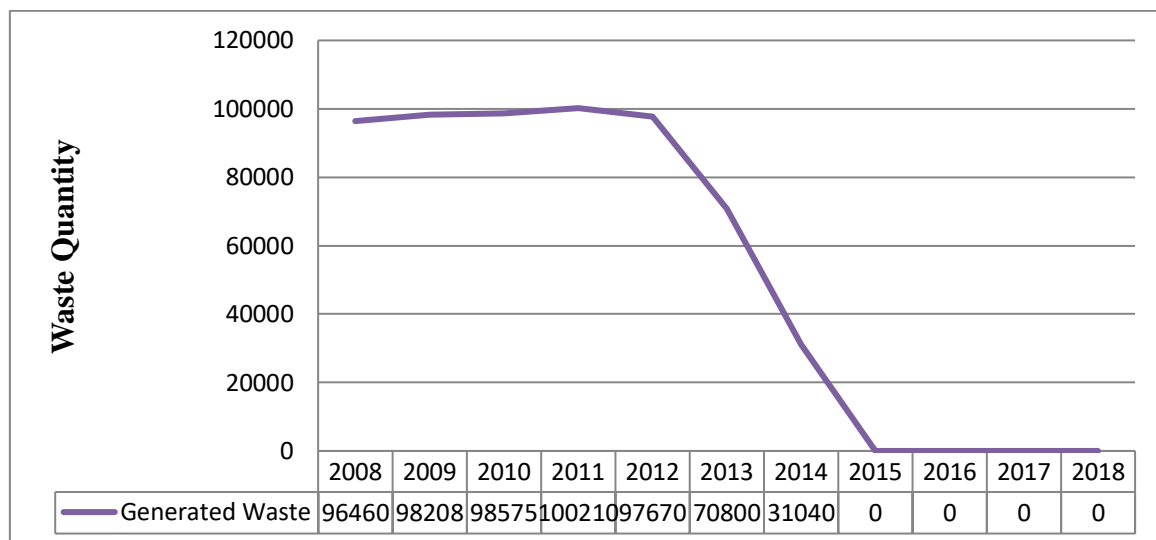
⁸⁹ Appendix n°3.

⁹⁰ ARAR (Abdelkader), HSE Manager at Unilever Algeria, May 12th, 2019.

⁹¹ Appendix n°3.8.

- 2012 Recycling of contaminated plastics and cardboard.
- 2013 Introducing electronic scales in each zone.
- 2014 Implementing composting process.
- 2015 zero waste landfill.

Figure n°3.9: Evolution of generated non hazardous waste



Source: The company's internal data, provided by HSE department.

As the figure show Unilever has been able to reach Zero waste landfill regarding non hazardous waste the company has been able to obtain this result by continuing with the 4R's approach of reducing, reusing, recovering or recycling, all while establishing that waste is in fact a resource with multiple use.

9. What are the principal actions taken in order to reach the zero-waste to landfill objective?

We usually start by:

- *Assessing the current waste management.*
- *Inventory of waste & breakdown per area.*
- *Develop the site waste network and control flows.*
- *Identify gaps and develop actions plan.*
- *Identify improvement opportunities.*
- *Install the basic solution (segregation, effective monitoring & records).*

- *RM loss assessment and recycling opportunities.*
- *Look for waste partnerships which meet agreed criteria (cost & service).⁹²*

So according to the interviewee, waste management process always starts with an evaluation of its efficiency and whether this process is still relevant enough to deal with the amount of waste generated daily all through the SC, then the following steps would be to assess the inventory of waste and analyzing the reasons for which this quantity was generated.

Identifying these flows or gaps during this process is a critical factor in order to make suitable correction plans and to create in the process improvement Opportunities with minimum investment; As a result the company is in fact generating 37% less waste than it did in 2008 in total.

An important other step during this process is to assess the amount of Raw Material lost or wasted during production, and scope for any opportunity of RM recycling.

Waste management process ends with applying the appropriate measure for each kind of disposable material (re-use, recycle, recover), and the waste destined to be sold is submitted to procedures aligned with Unilever's environmental standards that encourage any 3rd party to achieve environmental improvements.

Figure n°3.10: Waste management process



Source: Unilever Algeria's internal Data provided by the HSC department.

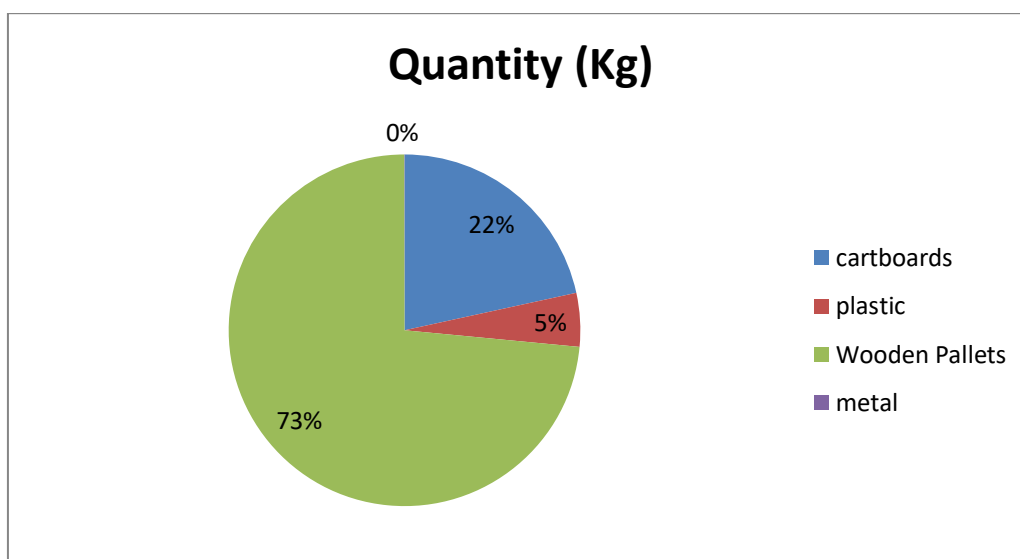
⁹² ARAR (Abdelkader), HSE Manager at Unilever Algeria, May 12th, 2019.

Table n° 3.5: The calculated quantity of recycled waste is 2019

Type of waste	Cardboards	Plastic	Wooden Pallets	Metal	Total
Quantity	18476	3312	65740	23	87551

Source: Unilever Algeria's internal Data provided by HSE department.

Figure n°3.11: The calculated quantity of recycled waste in 2019



Source: Based on table n°3.5 using Excel.

Observing the figure, we can conclude that pallets represent the biggest percentage of waste but also the simplest material to deal with as a result of the multiple possibilities it can be handled with (re-used, recycled), as opposed to plastic and cardboards that require a recovering process, therefore the first option taken by the company is reducing the use of these materials.

10. What are the main practices and means used in order to limit and control air emissions and dust levels?

- *Set targets within the Environment performance report related to air emission as well as the dust level within quality report.*

- *Monitoring and analysis in permanence.*
- *Establish an action plan to reach Unilever standards and legal compliances.*
- *Using WCM environment pillar tools⁹³ to define model areas then expansion to rest of areas.*
- *Re-use the lessons learnt and the best practices from other sites.⁹⁴*

Table n°3.6: Nature of air emission released during detergent production

Release area	Equipment	Nature of emissions
Detergent possess (NSD: non-soapy detergent or synthetic)	The Oven	NO _x (mg/Nm ³) CO ₂ (mg/Nm ³)
Exterior area	Transportation Vehicles All categories	CO(mg/Nm ³) CO ₂ (mg/Nm ³)
Utilities	The Boiler	SO _x (mg/Nm ³) NO _x (mg/Nm ³)

Source: Unilever Algeria's internal DATA, HSE department

The method used is based on the natural gas consumption and powder production reports.

The emission generated from the chimney is calculated according to the American EPA (Environment Protection Agency) procedure using emission factors and technical data.

The estimation of the quantities of pollutants released into the atmosphere, and more specifically those that fall under the UN Framework Convention on Climate Change are also calculated.

The results found are submitted as the environmental performance report and the quality report that contain both the results and the targets set by Unilever standards in order to measure the gaps between the two and establish corrective plans.

This procedure requires permanent monitoring, Evaluation and analyze

11. What are the actions undergone in order to decrease electricity, gas, and water consumption?

⁹³ Appendix n°3.9.

⁹⁴ ARAR (Abdelkader), HSE Manager at Unilever Algeria, May 12th, 2019.

- *At first, we are in the process of implementing Monitoring Measurement & Tracking System Project to get the real consumption of Electricity, Gas & Water in real time, in order to implement an action plan in case of deviation.*
- *Implementation of the Deep Dive environment actions for Eco-Efficiency analysis.*
- *Using "Simple Action, Big Difference" campaigns such as steam and air leak hunt.*
- *Environmental audit for (Energy, gas & water) to identify gaps during the consumption.⁹⁵*

As the interviewee mentioned, the company is currently in the process of implementing a Monitoring, Measurement & Tracking System, but until the project is finalized and responding to necessities in the previous years, Unilever has created a position for a specialist with the sole mission of monitoring the 12 different electricity counters in the 12 zones existing in the Oran manufacturing site. This makes it possible to have a better visibility and detecting major consumption centers, in order to carry out measures and action plans to decrease this consumption.

The specialist is responsible for submitting weekly and monthly reports, and look for potential areas for sustainable green energy investment.

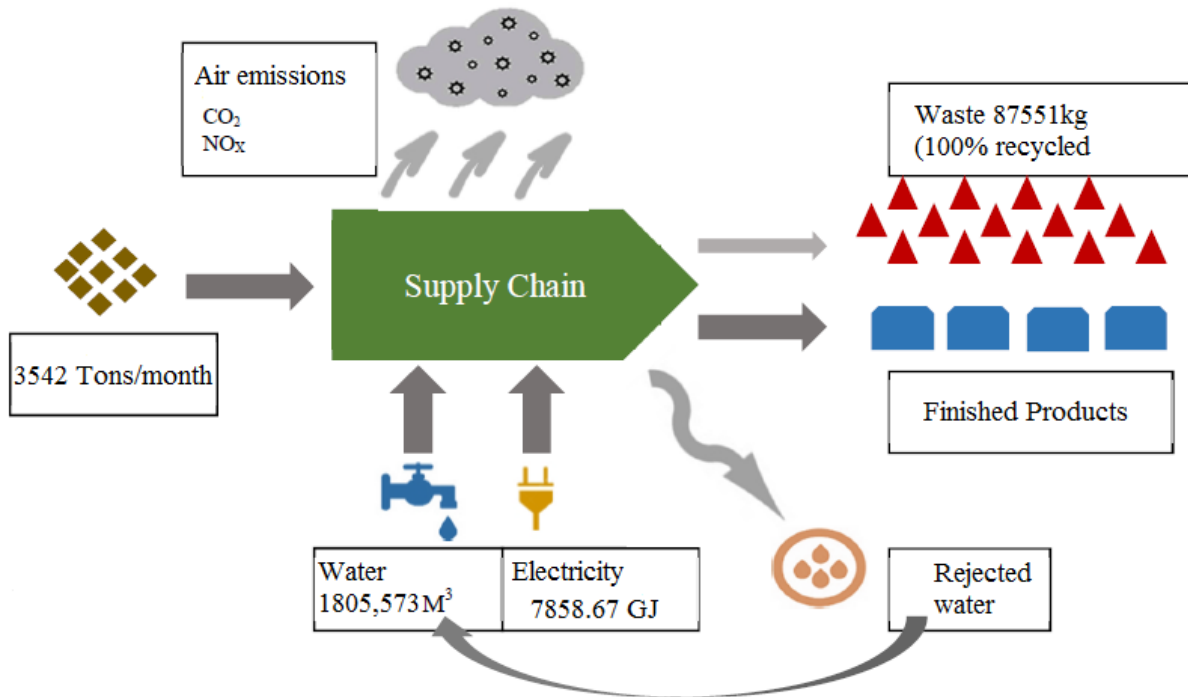
As regarding Gas, the same specialist is responsible for monitoring the total gas consumption of the boiler and the oven which are the main sources of use.

The new system will allow a better visibility, as a result of its high sensibility, therefore in will be possible to detect any source of over-consumption.

When it comes to water, Unilever has designed a closed water channel, which is responsible for recovering all the water used in the production process, to be processed and reused.

⁹⁵ ARAR (Abdelkader), HSE Manager at Unilever Algeria, May 12th, 2019.

Figure n°3.12: Environmental Performance of Unilever's Supply Chain (Results February 2019)



Source: Unilever Algeria's internal data provided by HSE department.

The figure highlights electricity and water consumption in February 2019, which represents key indicators when measuring the performance of the environmental policy.

In addition to implementing measuring systems, Unilever has made it a priority to implement deep dive actions for ECO-Efficiency Analysis in order to maintain the balance between financial performance and environmental impact.

Moreover, the employees' involvement is looked at as essential therefore awareness campaigns have been scheduled in addition to motivational activities.

All of these practices are monitored and audited in order to detect any kind of gaps or breaches with negative impact whether to the company's activity or the environment

12. What do you think of such practices?

« There are many benefits from such practices, one of them, is that Zero Waste to landfill is a key element to achieve the 2030 plan. Creating the ideal production system to

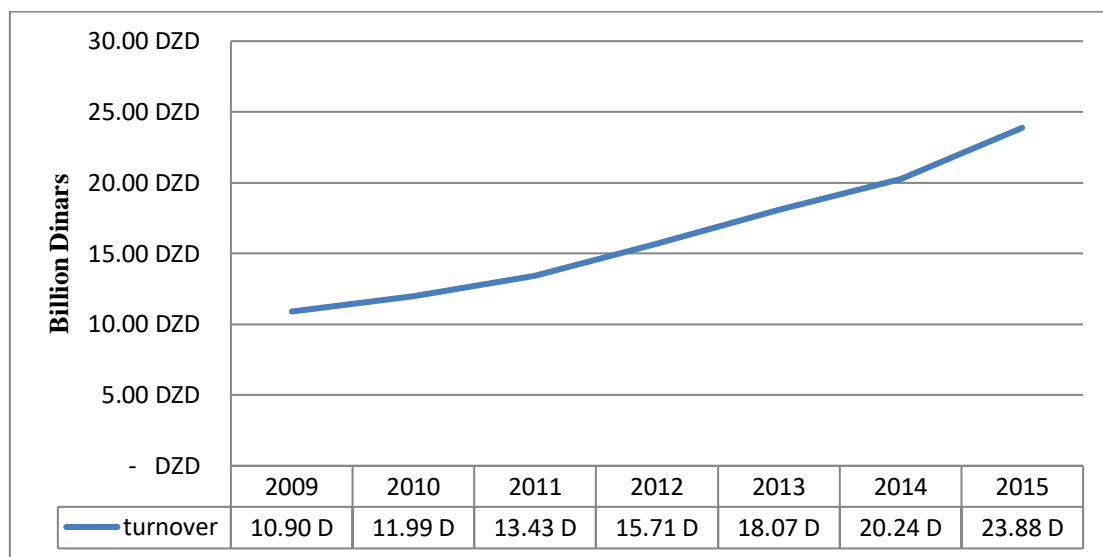
reach Zero Safety accidents, Zero Quality Incidents Zero Waste to landfill with the best resource consumption. »⁹⁶

As the interviewee assured, implementing practices related to GSCM along the chain are of significant positive impact.

Reaching zero waste landfill was considered an objective but now, it has become a step and a way to be used in order to fulfill the ultimate plan by 2030, this achievement has set the base for other actions to be taken creating in the process the perfect production environment where quality related incidents are at minimum level, and resource consumption is highly optimized, which only reflects the degree of commitment and implication Unilever has towards “making sustainability commonplace”.

This optimization has led into financial growth

Figure n°3.13: Unilever Algeria’s recorded Turnover



Source: Company’s internal Data, provided by the Finance department

The figure represents Unilever Algeria’s turnover through these past years, as we can observe the company has been able to maintain a steady growth, the company’s turnover has grown by 12% Between 2011 and 2012 coinciding with the start of waste segregation and recycling of contaminated plastics and cardboard, and a remarkable 32% growth between 2013 and 2015 as a result of multiple actions amongst which the introduction of electronic

⁹⁶ ARAR (Abdelkader), HSE Manager at Unilever Algeria, May 12th, 2019.

scales in different zones and the implementation of composting processes leading to zero waste landfill.

2.3. Quality part

At this stage we addressed quality related questions to Mr. Hichem SOUISSI, as the MCO Algeria Quality assistant manager he has perfect knowledge of the precautions undertaken in order to maintain or deliver the same level of quality, and the procedures used in order to set quality management systems.

13. How many certifications has Unilever Algeria been able to obtain?

« We have been able to get 8 Certifications since the beginning of activities. »⁹⁷

Unilever always considered Quality standards and ensuring excellence in operations a priority (GMP Standards, Traceability, Hygiene and HACCP), that's why it has been crucial to Build quality culture within the organization through a Proactive education and training system according to the detected gaps.

« Total of people that have been trained is 67 employees, in order to improve competency at all levels, establish a developing program for each individual and a good follow up system »⁹⁸

That's one of the reasons for which this well established company has been able to obtain a delivered orders percentage estimation of 95% (with no damage or missing/excess) in 2019 and an estimation of 2% of delivered orders followed by product return (Damaged during delivery), while a reported 0 % of Market return in this same year.⁹⁹

In addition, Unilever has been able to adopt innovation projects in "Do it Right the First Time" approaches and improvement projects (based on delivered quality and consumer feedback).

⁹⁷ Mr. Hichem SOUISSI, MCO Algeria Quality assistant manager at Unilever Algeria, May 14th, 2019.

⁹⁸ Idem.

⁹⁹ Idem.

Moreover, ensure the implementation of Quality Management System QMS according to ISO 9001 which Unilever has been able to obtain as a certification, and Implement incidents management systems (Returns, incidents simulations).

In addition to respecting the standards coming with obtaining an ISO 14001 certification, that can be regarded as a practice with a high influence in terms of increasing resource efficiency, waste management and gaining a competitive advantage.

And finally, ensure permanent shop inspections over the market for quality products using Unilever standards, and perform internal and external audits to ensure quality standards respect at all level all through the SC.

Synthesis of the study:

GSCM is the consideration of environmental factors, not only in its production process, but also in the daily actions of its employees, because problems such as depletion of natural resources cause losses that can potentially be avoided or minimized and these obstacles are of major effects on any country's economy and therefore on the company's performance.

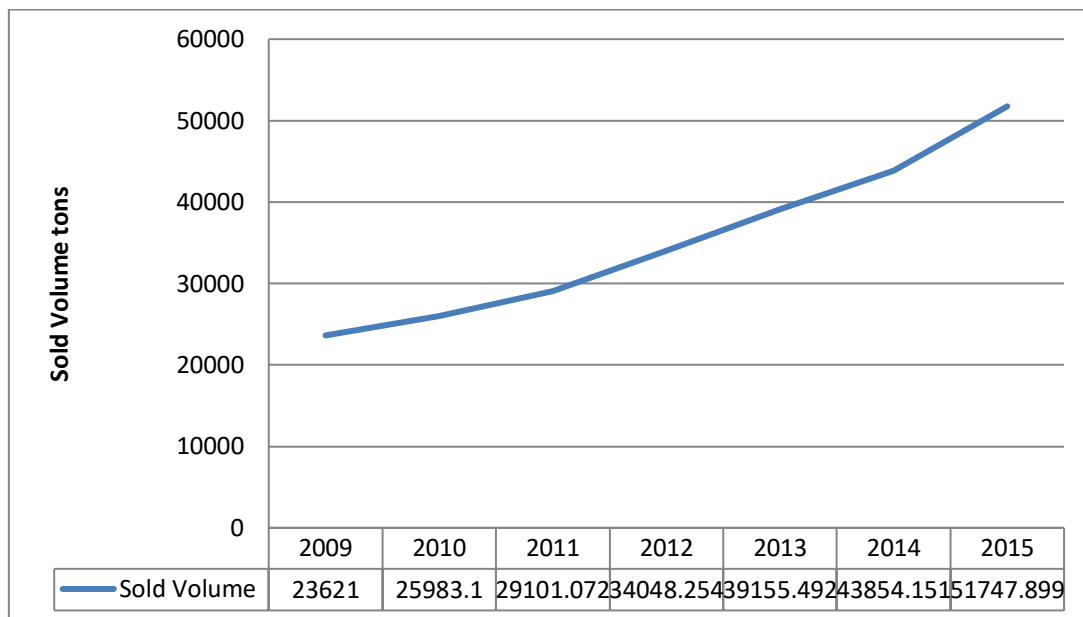
For a global company with Unilever's reputation and weigh, setting up an environmental strategy adapted to the country in which it operates is vital today. Because it allows the company:

- To sustain its activities in the face of resource depletion and rising energy prices.
- To control and reduce the negative environmental footprint of its activity while continuing to grow.

This is why many companies, like "Unilever", consider initiatives such as greening the SC, which shows in its implication and motivation to put plans such the "USLP" at the heart of its activity.

One of the major targets the company is trying to reach is to halve its natural resources consumption, reduce waste at all levels of the chain and reach a sustainable & responsible sourcing from suppliers who respect and understand the standards delivered by Unilever, which has represented a breakthrough as these practices were considered to cost more than it would benefit the company, and this assumption has been proven wrong as a result of the major advantages related to cost, quality and brand image.

Figure n°3.14: Quantity of sold products



Source: Unilever Algeria's internal DATA, provided by finance Department

The figure represents the quantity of sold products all through these past years; we can conclude that implementing GSCM related practices hasn't affected negatively production levels as the costs saved through these actions were invested in order to raise production and increase the company's turnover in the process.

"UNILEVER" is committed to a number of important practices, including 4Rs (reducing, re-using, recycling and recovexring), which the company has been able to alter in order to comply with its needs and resources adding in the process a fifth R which is Refuse, i.e. Avoid waste being generated in the first place, because minimizing waste at its source is a far better approach to adopt in order to enhance the environmental impact while saving costs. Other approaches were deployed including green purchasing, minimizing the use of non-hazardous materials and reaching zero waste landfill when it comes to these materials.

These practices allowed the company to:

- reduce its water consumption and reaching zero water waste;
- Positioning itself as an environmentally conscious company and improving its image;
- Waste reduction, and therefore costs.
- Improving environmental performance

In addition, through planning to implement a Monitoring Measurement & Tracking System, Unilever has shown its interest in reducing resources over-consumption (electricity, gas and water). Because the zero waste landfill objective that became a reality way before its targeted schedule, has set a ground for other actions to be taken, in order to optimize the production process by minimizing quality related malfunctions, This optimization has led into financial growth.

Finally, Getting certified in ISO 9001 the internationally recognized Total Quality Management System and ISO 14001 that specifies requirements for an effective environmental management system are key indicators in measuring this company's involvement in enhancing the quality of its products and the quality of the processes and procedures followed all through the Supply Chain.

Research results:

We can conclude that GSCM's practices haven't been exploited to the fullest at Unilever Algeria, and there is still a large room for improvements, and adaption of other more beneficial practices.

The largely applied GSCM practices within Unilever are a part of its "USLP" through its purpose oriented strategies guided by its goal to "make sustainability a commonplace".

This approach is adopted in order to limit environmental effect but also ensure activity growth by multiple strategies:

- Waste reduction through adopting the 4R's approach, these actions had as a result reaching the zero waste landfill of non hazardous material.
- Efficient resource consumption, through monitoring energy and water use.

The company has been able to successfully optimize water use through creating a closed channel that recover, treat and allow water re-use, in addition to planning to halve its energy consumption especially after its storage system automation (HDSS) that has negatively impacted its plans of reduction, but has been able to gain in terms of reduction in quality related incidents (packaging damage, products damage during transportation...), as a result these incidents has been reduced and product storage optimized.

Chapter 03: Green Supply Chain Management's role in improving Operational Efficiency at Unilever Algeria **114**

- Green sourcing, through dealing with suppliers who are environmentally conscious and are responsible and who comply with Unilever's environmental policy.
- All 3rd parties and private contractors dealing with the company –especially those responsible for waste disposal- are obliged to comply with the conditions and procedures dictated by Unilever.

All parties dealing with the company are required to undergo evaluations and audits that ensure their compliance and their procedures' accordance with the company's policy.

These procedures ensure the reduction of the environmental footprint.

In addition, contrary to common beliefs these actions had in fact a positive effect on financial performance, through:

- Cost reduction resulting from resource efficiency.
- Waste recovery and re-use.

Ensuring in the process significant financial gain – 32% increase in the company's turnover between 2013 and 2015-.

- Having been able to get ISO 14001 and ISO 9001 certified, are in fact key indicators of the positive impact Unilever's GSCM practices have been able to obtain.

In addition to other positive effects such as:

- Facilitates the implementation of corrective action plans where performance needs improvements.
- Detects opportunities and set action plans accordingly.
- Enhances resource consumption and avoid wastage.
- Enhances data quality.
- Improves supply chain audits and increases visibility.

Recommendations:

Having observed the major practices adopted by Unilever and the gaps residing in-between, it's convenient to propose to:

- Think of a solution that improves the environmental impact and financial growth.

In other words, the company must act considering the option of "renewable energies", as we've been able to observe, electricity reduction has faced an obstacle as a result of the automated storage system (HDSS) which made it difficult to optimize energy consumption, therefore, it seems logical to consider renewable energies especially through the use of solar panels, for the long term advantages it has to offer in spite of the investment it requires in the present.

Having in mind that Algeria is a country with a significant amount of sun exposure (around 2800 exploitable hours per year); the sun would appear as the most efficient and sustainable resource to exploit.

We therefore propose to Unilever to equip its facilities with solar panels for part of its energy consumption.

- Engage in partnerships with well established sustainable environmental solutions companies.

Partnerships of this kind will allow the company to assess efficiency gaps, performance shortage, and exploit professional and qualified experience, in order to reach the most effective solutions in accordance with operational standards, all while maintaining minimum costs and assuring total coordination and synergy between different company departments, because it is essential to understand that collaboration is critical for efficient sustainability practices.

These kinds of partnerships don't only rely on monitoring and corrective measures, but they also allow prevention measures to take place, in order to avoid unnecessary resource consumption, waste generation, and reduce costs in the process.

Although it represents a heavy investment, such partnerships have many benefits on the long term.

- One of the major problems in adopting GSCM related practices is measuring its results and impact in terms of economic gain or loss, therefore when implementing these practices it is looked at as measures solely for environmental purposes.

Therefore, it seems convenient to propose to go through a process of quantifying the results obtained when using such measures by linking sustainability to a business case.

That is to say, present a business case that identifies areas of concerns and highlights major obstacles at the same time as stating possible advantages, all while studying the amount of investment required and the forecasted quantifiable gains resulting from such practices throughout the years.

Within this context, it is critical to insure that regular sustainability reports are made in order to make sure that the measured financial and environmental impact are aligned with forecasts.

Conclusion of the chapter

In conclusion, we can now say with certainty that the environmental commitment of Unilever has provided this company with important benefits.

The environmental consciousness the company has grown to have has a direct relation with its competitiveness, having in mind that today's global status of the environment represents a turning point to every company looking to set itself aside from other competitors through its practices.

Therefore, it seems that a SCM oriented towards sustainable development, that is to say a GSCM, improves the environmental performance with certainty, but also and partly economic performance as a result of the cost saved and gained through their different approaches.

Finally, we have deduced that this impact on economic performance is indirect and often goes through one or more intermediate variables, such as waste reduction, customer loyalty and the improvement of the company's image... which are in turn factors of improvement regarding the economic performance and in the process the operational efficiency.

General Conclusion

SCM has never been a simple or easy concept; it is an extremely important part of any business, and has proven to provide certain homogeneity and coordination between different functions. Yet it represents a more or less neglected practice at the Algerian companies.

SCM is recognized as a business practice that needs to be adapted to costumers' needs and the evolution of the market, as a result it undergoes significant changes and levels of development and Its impact on economic performance is positive yet moderate on a general level because it is relatively indirect, we have seen that improvements in delivery time, cost and customer loyalty seem to confirm the importance of its evolution.

As a result, in recent years we have witnessed the introduction of a relatively new environmental oriented supply chain, that is to say a Green Supply Chain Management, a significant ramification of the need for Algerian companies to adapt their current practices to the context of environment preservation.

Overexploitation of natural resources has been a significant factor in the rise of environmental consciousness in Algeria.

In recent years, the ecological context has reached unprecedented seriousness, which risks not only upsetting social but also operational efficiency.

integrating environmental thinking all through the company's supply chain translates the need to provide a level of coordination between traditional logistical practices and environmental management practices, one of which is framed by the international certifying body ISO through ISO 14001 certification for example.

Adopting green practices that promotes business sustainability as well as environmental sustainability has become a leader concern and it manifests through the growing interest in practices such waste management, green and responsible sourcing, and reducing resource consumption.

These practices have proved to have significant advantages, which allowed us to answer our initial research question, which is, we recall: « *what is the impact of implementing GSCM on operational efficiency?* »

We chose "Unilever" to be our study case due to the company's involvement and significant interest in sustainability and environmental impact.

The results of our research led to confirm the initial assumptions. As a result we can say with certainty that:

- **GSCM is an efficient tool to enhance environmental impact and sustainability.**

- **Implementing GSCM can increase resource efficiency and lower production costs.**

We can now say that this new environmental practices have brought changes in Unilever's supply chain; these changes have been associated with a rather positive outcome.

Through this research we have been able to see that implementing GSCM related practices doesn't only reduce the negative environmental footprint but also improves both economic performance and offers a competitive advantage.

That's why in today's economy, the strategic decision of the most capable companies would be to aim towards greener solutions and a more sustainable development oriented supply chain, keeping in mind that the advantages harvested from certain green practices within a company are not necessarily the same harvested within another one.

We therefore affirm, based on this study that implementing a GSCM even if it's not to the fullest, has had significant positive effects whether regarding costs, resource consumption, waste reduction or competitive advantage.

In addition, we note that number of employees having had training in environmentally related practices in 2019 (67 employees) remains relatively small in comparison with the importance and advantages these practices can have on the long term.

We recommend the company "Unilever Algeria" to enrich its practices with new dimensions by relying on new ecological indicators. We also recommend expanding this study several times for areas of improvement to be possible.

The GSCM practices seem to really exist and its volume is considerable, but in many forms it can be further exploited and adjusted to the company's activity.

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Appendices

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Appendix n°3.1: The USLP




IMPROVING HEALTH AND WELL-BEING FOR MORE THAN 1 BILLION


By 2020 we will help more than a billion people take action to improve their health and well-being.

> Explore our big goal

- Health & hygiene >
- Improving nutrition >



We are taking action on the UN Sustainable Development Goals




REDUCING ENVIRONMENTAL IMPACT BY HALF


By 2030 our goal is to halve the environmental footprint of the making and use of our products as we grow our business.*

> Explore our big goal

- Greenhouse gases >
- Water use >
- Waste & packaging >
- Sustainable sourcing >



We are taking action on the UN Sustainable Development Goals




Capture rectangulaire

ENHANCING LIVELIHOODS FOR MILLIONS

By 2020 we will enhance the livelihoods of millions of people as we grow our business.

> Explore our big goal

- Fairness in the workplace >
- Opportunities for women >
- Inclusive business >



We are taking action on the UN Sustainable Development Goals

Appendix n°3.2: Unilever's code of business



THE CODE OF BUSINESS PRINCIPLES (1 of 2)

Standard of Conduct

We conduct our operations with honesty, integrity and openness, and with respect for the human rights and interests of our employees.

We shall similarly respect the legitimate interests of those with whom we have relationships.

Obeying the Law

Unilever companies and employees are required to comply with the laws and regulations of the countries in which we operate.

Employees

Unilever is committed to a working environment that promotes diversity and equal opportunity and where there is mutual trust, respect for human rights and no discrimination.

We will recruit, employ and promote employees on the sole basis of the qualifications and abilities needed for the work to be performed.

We are committed to safe and healthy working conditions for all employees.

We will provide employees with a total remuneration package that meets or exceeds the legal minimum standards or appropriate prevailing industry standards.

We will not use any form of forced, compulsory, trafficked or child labour.

We are committed to working with employees to develop and enhance each individual's skills and capabilities.

We respect the dignity of the individual and the right of employees to freedom of association and collective bargaining.

We will maintain good communications with employees through company-based information and consultation procedures.

We will ensure transparent, fair and confidential procedures for employees to raise concerns.

Consumers

Unilever is committed to providing branded products and services which consistently offer value in terms of price and quality, and which are safe for their intended use. Products and services will be accurately and properly labelled, advertised and communicated.

Shareholders

Unilever will conduct its operations in accordance with internationally accepted principles of good corporate governance.

We will provide timely, regular and reliable information on our activities, structure, financial situation and performance to all shareholders.

Business Partners

Unilever is committed to establishing mutually beneficial relations with our suppliers, customers and business partners. In our business dealings we expect our partners to adhere to business principles consistent with our own.

Community Involvement

Unilever strives to be a trusted corporate citizen and, as an integral part of society, to fulfil our responsibilities to the societies and communities in which we operate.

Public Activities

Unilever companies are encouraged to promote and defend their legitimate business interests.

Unilever will co-operate with governments and other organisations, both directly and through bodies such as trade associations, in the development of proposed legislation and other regulations which may affect legitimate business interests.

Unilever neither supports political parties nor contributes to the funds of groups whose activities are calculated to promote party interests.



Appendix n°3.3: Unilever's code of business



THE CODE OF BUSINESS PRINCIPLES (2 of 2)



The Environment

Unilever is committed to making continuous improvements in the management of our environmental impact and to the longer-term goal of developing a sustainable business.

Unilever will work in partnership with others to promote environmental care, increase understanding of environmental issues and disseminate good practice.

Innovation

In our scientific innovation to meet consumer needs we will respect the concerns of our consumers and of society.

We will work on the basis of sound science, applying rigorous standards of product safety.

Competition

Unilever believes in vigorous yet fair competition and supports the development of appropriate competition laws. Unilever companies and employees will conduct their operations in accordance with the principles of fair competition and all applicable regulations.

Bribery & Corruption

Unilever does not give or receive, whether directly or indirectly, bribes or other improper advantages for business or financial gain. No employee may offer, give or receive any gift or payment which is, or may be construed as being, a bribe. Any demand for, or offer of, a bribe must be rejected immediately and reported to management.

Unilever accounting records and supporting documents must accurately describe and reflect the nature of the underlying transactions. No undisclosed or unrecorded account, fund or asset will be established or maintained.

Conflicts of Interests

All employees and others working for Unilever are expected to avoid personal activities and financial interests which could conflict with their responsibilities to the company.

Employees must not seek gain for themselves or others through misuse of their positions.

Compliance – Monitoring – Reporting

Compliance with these principles is an essential element in our business success. The Unilever Board is responsible for ensuring these principles are applied throughout Unilever.













The Chief Executive Officer is responsible for implementing these principles and is supported in this by the Global Code and Policy Committee which is chaired by the Chief Legal Officer.

Day-to-day responsibility is delegated to all senior management of the geographies, categories, functions and operating companies. They are responsible for implementing these principles, supported by local Business Integrity Committees. Assurance of compliance is given and monitored each year. Compliance is subject to review by the Board supported by the Corporate Responsibility Committee and for financial and accounting issues the Audit Committee.

Any breaches of the Code must be reported. The Board of Unilever will not criticise management for any loss of business resulting from adherence to these principles and other mandatory policies. Provision has been made for employees to be able to report in confidence and no employee will suffer as a consequence of doing so.

Note
In this Code the expressions 'Unilever' and 'Unilever companies' are used for convenience and mean the Unilever Group of companies comprising Unilever N.V., Unilever PLC and their respective subsidiary companies. The Board of Unilever means the Directors of Unilever N.V. and Unilever PLC.

Appendix n°3.4: List of Unilever’s products distributed in Algeria

Categories	Brand	Picture
Home care	OMO JIF Surf	  
Personal care	Dove Clear Sunsilk LUX Rexona Axe Signal	      
Food	Knorr Lipton	 

Appendix n°3.5: Unilever’s automated packaging system



Appendix n°3.6: Pallets' workshop



Appendix n°3.7: Unilever's environmental sustainability policy

Environment Sustainability Policy

Unilever Algeria, as part of Unilever NAME, is committed to meeting the needs of customers & consumers in an environmentally sound & sustainable manner, through continuous improvement in environmental performance of our product, activities, & services.

Objectives:

We will:

- Comply with all local environment legislations where we operate.
- Proactively assess environment risks associated with all our operations & implement effective control measures.
- Continuously improve our environment & sustainability standards through upgrading our infrastructure, processes & procedures.
- Reduce the environmental footprint of our business & brands to protect the environments in which we work & live.
- Actively seek to reduce waste, conserve resources, prevent pollution, explore & promote opportunities for waste re-use/recycling in line with the Unilever Sustainable Living Plan (USLP) & Zero Waste to Landfill (ZWTL) Commitment.
- Build environment & sustainability capability across all work levels & functions of the organisation.
- Ensure line management is responsible & accountable for managing environment sustainability.
- Integrate sustainability requirements into our purchasing & procurement system.
- Encourage our business partners & joint ventures to implement environment sustainability best practices.

This Code Policy sets out what Unilever & its employees must do to meet these aims.

Roles & Responsibilities:

Unilever Algeria believes that harm to the environment can be prevented. All of us have a role to play to reduce the environmental footprint of our operations in line with Unilever Sustainability Living Plan.

- As condition of our employment, we all have a duty to comply with all local environment legislation as well as Unilever's environment standards.

All employees, contractors & visitors to Unilever sites must take considerations for their impact on the environment. This means we must:



- Evaluate our environmental impacts at every stage, from sourcing of raw materials for our products all the way through consumers' use & disposal.
- Conform to ZWTL (Zero Waste to Landfill) requirements by using the recycling stations provided at each site efficiently & following the proper segregation guidelines provided at each recycling station.

In addition, all Unilever employees must:

- Encourage our suppliers, contract operators, contractors, customers, distributors & merchandisers to achieve environmental improvements throughout our extended Supply Chain
- Work with industry bodies, government agencies, business partners & other concerned organisations to promote environmental care & sustainability, increase knowledge & share best practice.

All Unilever **Site Leaders** have overall operational responsibility for managing environmental sustainability at their location. They must:

- Establish & maintain an appropriate environment management system for their site
- Identify the environment aspects & manage/control their impact arising from the site's routine & planned operations, activities & services.
- Regularly review & audit compliance with:
 - All applicable local environment legislation & regulations
 - Unilever's global Environmental Standards.
- Develop site-specific environment improvement objectives & regular monitor & review performance.
- Report mandatory Key Performance Indicators (KPIs) via the Environmental Performance Reporting (EPR) system.
- Report & investigate all environment incidents in order to prevent recurrence.
- Provide all employees, contractors & visitors training in environment & sustainability relevant to their roles & activities including the waste segregation guideline to conform to our ZWTL commitment
- Ensure that all employees are aware of the Company's Environmental policy & motivated to apply it

Authorised by:

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EVP NAME TRUB

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MD Maghreb

Maamar Bettahar
Oran Factory Manager

Review date : Jan 2019

Appendix n°3.8: Zero waste Landfill



Appendix n°3.9: Waste segregation zone



Appendix n°3.10: Energy and gas consumption

Date	Reporting of Electricity and Gaz data from counter's											Gaz counter
	Electricity counter's											
	Powerlogic (Total)	Unial	NSD	NSD Lighting	Packing	Warehouse Lighting	PP (Shampoo)	ADM/Lab	Maintnance/ Workshop	SITE Lighting	Utilities	Gaz
7-mars-18	8076,37	775,29	5182204	3509,7	244	1283,6	601,29	2682,7	246,9	318,04	8028,1	2472079,1
8-mars-18	8082,16	775,7	5177892	3510,06	244,4	1283,9	601,36	2683,3	246,95	318,07	8027,5	2474695,2
9-mars-18	8086,37	775,34	5189422	3511,4	244,4	1284,2	601,46	2683,8	247,02	318,09	8029	2476244,1
10-mars-18												
11-mars-18	8094,29	775,39	5126680	3512,2	245,6	1284,7	601,55	2684,3	247,42	318,13	8033,9	2482277,9
12-mars-18	8095,72	775,41	5126723	3513,7	245,7	1284,8	601,69	2685,1	247,44	318,16	8034,1	2482601,5
13-mars-18	8098,41	775,44	5125041	3514,2	245,7	1285,1	601,75	2685,5	247,16	318,19	8035	2482845,7
14-mars-18	8094,9	775,47	5127457	3515,3	245,2	1285,4	601,85	2686,2	247,23	319	8036,8	2484259,6
15-mars-18	8021,51	775,49	5122895	3516,1	245,5	1285,5	601,9	2686,5	247,25	319,03	8037,7	2486453,9
16-mars-18	8030,55	775,51	5131786	3517,1	245,9	1285,7	601,98	2687	247,28	319,05	8042	2489536,5
17-mars-18	8040,14	775,54	5137821	3518,1	247,5	1286	602,04	2687,5	247,31	319,07	8043,9	2491821,9
18-mars-18	8052,05	775,56	5141377	3519,2	248,3	1286,3	602,12	2687,9	247,24	319,09	8046,8	2493677,8
19-mars-18	8062,74	775,59	5146279	3520,2	249,1	1286,5	602,17	2688,2	247,36		8048,4	2495238,9
20-mars-18	8073,35	775,61	5151021	3521,2	249,8	1286,9	602,23	2688,5	247,39	319,13	8052,1	2510484,3
21-mars-18	8084,08	775,64	5157641	3522,2	2420,5	1287	602,3	2688,9	247,41	319,15	8055	2515743,1
22-mars-18	8094,25	775,66	5161807	3523,3	2421,2	1287,3	602,37	2689,4	247,44	319,17	8057,7	2519652,5
23-mars-18	6,02	775,7	5167225	3524,3	2421,9	1287,5	602,51	2690	247,5	319,19	8060,7	2525886,2
24-mars-18	17,79	775,73	5172964	3525,3	2422,7	1287,8	602,69	2690,5	247,54	319,21	8063,5	2530890,5
25-mars-18	28,17	775,75	5177919	3526,4	2423,4	1288,1	602,8	2691	247,58	319,23	8066,3	2536838,2

Appendix n°3.11: WCM (World class manufacturing) environmental tools

Technical Pillar	Why	Purpose
SAF Safety	Continuous improvement of safety	To reduce drastically the number of accidents. To develop a culture of prevention. To improve the ergonomics of the workplace. To develop specific professional skills.
CD Cost Deployment	Analysis of the losses and costs (losses within the costs)	To identify scientifically and systematically the main items of loss in the system production-logistics business. To quantify the potential economic benefits and expected. To address the resources and commitment to managerial tasks with greatest potential.
FI Focused Improvement	Priorities of actions to management the loss identified by the cost deployment	To reduce drastically the most important losses present in the system manufacturing plant, eliminating inefficiencies. To eliminate non-value-added activities, in order to increase the competitiveness of the cost of the product. To develop specific Professional skills of problem solving.
AA Autonomous Activities	Continuous improvement of plant and workplace	It is constituted by two pillars: <i>AM Autonomous Maintenance</i> . It is used to improve the overall efficiency of the production system through maintenance policies through the conductors (equipment specialists). <i>WO Workplace Organization</i> . It is develops to determine an improvement in the workplace, because often the materials and equipment are degrade; in particular because in the process there are many losses (MUDA) to remove.
PM Professional Maintenance	Continuous improvement of downtime and failures	To increase the efficiency of the machines using failure analysis techniques. To facilitate the cooperation between conductors (equipment specialists) and maintainers (maintenance people) to reach zero breakdowns.
QC Quality Control	Continuous improvement of customers' needs	To ensure quality products. To reduce non-compliance. To increase the skills of the employees.
LOG Logistics & Customer Service	Optimization of stocks	To reduce significantly the levels of stocks. To minimize the material handling, even with direct deliveries from suppliers to the assembly line.

Technical Pillar	Why	Purpose
EEM Early Equipment Management EPM Early Product Management	Optimization of installation time and costs and optimization of features of new products	To put in place new plants as scheduled. To ensure a rapid start-up and stable. To reduce the Life Cycle Cost (LCC). To design systems easily maintained and inspected.
PD People Development	Continuous improvement of the skills of employees and workers	To ensure, through a structured system of training, correct skills and abilities for each workstation. To develop the roles of maintenance workers, technologists, specialists such as major staff training.
ENV Environment ENE Energy	Continuous improvement environmental management and reduce energy waste	To comply with the requirements and standards of environmental management. To develop an energy culture and to reduce the energy costs and losses.

Appendix n°3.12: The interview guide

Dear Sir/Madam

My name is ZENNIR Ines, I am a student at EHEC School majoring in Distribution and Supply Chain Management, and I am in the process of preparing my Master's thesis. I am studying the impact of implementing Green Supply Chain management on operational efficiency, and to further enrich my research I am hoping you can answer the following questions.

I would like to thank you in advance for your time and assistance.

1st part:

Can you give a brief presentation of yourself?

- Your name
- Your current position at Unilever Algeria

2nd part:

Supply Chain part:

1. To what extent do you think the company is committed to limiting its environmental impact?
2. How does that affect its activity?
3. When facing storage-space shortage, what are the actions taken in order to optimize the use of that space?
4. What are the measures taken in order to repair and reuse damaged pallets?
5. Can you explain your department's role in the process of waste management?
6. What impact does that have on the company's performance?
7. Can you give us a clear estimation of the number of orders delivered within the right delivery time in the year 2019?

HSE part:

1. What are the factors that need to be considered when making the HSE performance monthly report?
2. Can you explain your department's policies in terms of waste management?
3. Can you give us an estimation of the waste recovered or recycled in the year 2019?
4. What are the principal actions taken in order to reach the zero waste objective?
5. What do you think of such practices?

6. What are the main practices and means used in order to limit and control air emissions and dust levels?
7. What are the actions undergone in order to decrease electricity, gas, and water consumption? (Please provide an estimation of electricity, gas and water consumption in the year 2019)
8. Can you give an estimation of the number of employees that had training in “environment-friendly procedures” in the year 2019?
9. What is, in your opinion, the impact of that training?

Quality part:

1. How many certifications has Unilever Algeria been able to obtain?
2. Can you give an estimation of the percentage of orders delivered within the right conditions (with no damage) in the year 2019?
3. Can you give us an estimation of the percentage of product returns due to quality problems in the year 2019?

Appendix n°3.13: The interview with the Supply Chain process Control, claims & pallets management specialist

1st part:

Can you give a brief presentation of yourself?

- Your name : Fatma Hakima KOUBA
- Your current position at Unilever Algeria : Supply Chain process Control, claims & pallets management specialist

2nd part:

Supply Chain part:

1. To what extent do you think the company is committed to limiting its environmental impact?

« Unilever takes the environment and sustainability as a priority in its aims and it has launched several programs to minimize our operations' impact on the environment in order to reach our goal of cutting our environmental footprint by half by 2030.

We consider that our waste reduction has an impact on the whole value chain, from sourcing our raw materials to within our own manufacturing and operations. That's why we aim to source our raw materials sustainably from suppliers who share our vision»

2. How does that affect its activity?

« These programs are not disturbing its activities, on the contrary, they are making them more organized and purpose oriented. »

3. When facing storage-space shortage, what are the actions taken in order to optimize the use of that space?

« In this case we have two possibilities. First we can do what we call REPLENISHMENT, it means transfer products between our two warehouses (from the full to the empty).

When the first operation is not possible (our two warehouses are full) we convert to the second solution which is to rent a 3rd warehouse (an overflow) just for the period when we have storage space issue. »

4. What are the measures taken in order to repair and reuse damaged pallets?

« We have a team that specializes in pallets reparation at Oran level, so the pallet is re-used but when the reparation is not possible (pallet very damaged and can't be re-used) we use their wood on other pallets' reparation. »

5. Can you explain your department's role in the process of waste management?
- *We are respecting all processes related to waste segregation.*
 - *Arranging "raise awareness" tours to our 3PL team about the importance of waste management and sustainability.*
 - *A workshop was created specifically for pallet repair, with 0 DZD worth of investment; more than a third of the damaged pallets are recovered.*
6. What impact does that have on the company's performance?

There are multiple benefits

- *Saving cost (through adapting the 4R's approach)*
 - *Respecting the environment.*
 - *Implementing a new culture inside warehouse.*
 - *Avoid out of control material handling costs.*
 - *Increase of efficiency.*
7. Can you give us a clear estimation of the number of orders delivered within the right delivery time in the year 2019?
- « In 2019 we have been able to reach 97% of delivered orders within the agreed upon delivery date»

Appendix n°3.14: The interview with HSE manager

HSE part:

1st part:

Can you give a brief presentation of yourself?

- Your name: Abdelkader ARAR.
- Your current position at Unilever Algeria: HSE Manager.

2nd part:

1. What are the factors that need to be considered when making the HSE performance monthly report?

The activity takes into account 8 factors:

- *Risk Assessment procedure;*
- *Evaluation procedure for environmental aspects;*
- *Energy management procedure;*
- *Waste management procedure;*
- *Noise measurement procedure;*
- *Notification procedure for accidents and serious incidents;*
- *Communication procedure;*
- *Follow-up sheet.*

2. Can you explain your department's policies in terms of waste management?

« As WCM site & in terms of waste management, we have a policy that has as a goal ensuring Sustainable Growth while reducing our Environmental Impact & contributing to Unilever's Sustainability Living Plan (USLP)

In addition to reducing generated Waste, Achieve & maintain Zero Waste to Landfill. »

3. Can you give us an estimation of the waste recovered or recycled in the year 2019?

«The calculated quantity of recycled waste is around 87551 KG»

4. What are the principal actions taken in order to reach the zero-waste objective?

We usually start by:

- *Assessing the current waste management.*
- *Inventory of waste & breakdown per area.*
- *Develop the site waste network and control flows.*
- *Identify gaps and develop actions plan.*
- *Identify improvement opportunities.*
- *Install the basic solution (segregation, effective monitoring & records).*

- *RM loss assessment and recycling opportunities.*
- *Look for waste partnerships which meet agreed criteria (cost & service).*

5. What do you think of such practices?

*« There are many benefits from such practices, one of them, is that Zero Waste to landfill is a key element to achieve the 2030 plan. **Creating the ideal production system to reach Zero Safety accidents, Zero Quality Incidents Zero Waste to landfill with the best resource consumption.** »*

6. What are the main practices and means used in order to limit and control air emissions and dust levels?

- *Set targets within the Environment performance report related to air emission as well as the dust level within quality report.*
- *Monitoring and analysis in permanence.*
- *Establish an action plan to reach Unilever standards and legal compliances.*
- *Using WCM environment pillar tools to define model areas then expansion to rest of areas.*
- *Re-use the lessons learnt and the best practices from other sites.*

7. What are the actions undergone in order to decrease electricity, gas, and water consumption?

- *At first, we are in the process of implementing Monitoring Measurement & Tracking System Project to get the real consumption of Electricity, Gas & Water in real time, in order to implement an action plan in case of deviation.*
- *Implementation of the Deep Dive environment actions for Eco-Efficiency analysis.*
- *Using “Simple Action, Big Difference” campaigns such as steam and air leak hunt.*
- *Environmental audit for (Energy, gas& water) to identify gaps during the consumption.*

8. Can you give an estimation of the number of employees that had a training in “environment-friendly procedures” in the year 2019?

« Total of people that have been trained is 67 employees. »

9. What is, in your opinion, the impact of that training?

Such procedures had some impressive results, it enabled us to:

- *Improve competency at all levels*
- *Establish a developing program for each individual and a good follow up system*
- *Establish a proactive education and training system.*

Appendix n°3.15: The interview with the MCO Algeria quality assistant

Quality part:

1st part:

Can you give a brief presentation of yourself?

- Your name: Hichem SOUISSI.
- Your current position at Unilever Algeria: MCO Algeria Quality assistant manager.

2nd part:

1. How many certifications has Unilever Algeria been able to obtain?

« We have been able to get 8 Certifications since the beginning of activities. »

2. Can you give an estimation of the percentage of orders delivered within the right conditions (with no damage) in the year 2019?

« Compliant delivered Orders percentage estimation (with no damage or missing/excess) for 2019: 95 %»

3. Can you give us an estimation of the percentage of product returns due to quality problems in the year 2019?

« An estimation of 2% of delivered orders implies product return (Damaged delivery), 0 % Market return»

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