IMPLEMENTATION OF REVERSE LOGISTICS IN A FIRM.
The case of Danone

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A. INDEX OF TABLES

1. INTRODUCTION

Over the past decades, we have witnessed unprecedented growth in demand for resources, due to rapid industrialization of emerging economies and continued high use of resources in developed countries. Linking economic development to the consumption of raw materials, the basis of the linear economy, represents an unsustainable model for the economy, society and the environment (Dominguez, 2014). According to the United Nations (UN, 2013) the negative impact is expected to increase, estimating an increase in the world population of 8.6 billion by 2030. In addition, due to the increase in the standard of living in developing countries, the middle class will reach 3 billion, which will consolidate the increase in consumption, generating waste at a speed that is undesirable for global sustainability.

In addition, it is necessary to mention the environmental impact associated with the production and consumption model of the linear economy. Not only does the linear economy present risks at the level of resource scarcity, but the growing generation of waste that accompanies it, which rapidly contaminates terrestrial and marine ecosystems, is particularly alarming. The main environmental problem associated with the linear economy is that it is initially making use of non-renewable resources for its activities, but these resources are being depleted, causing major climate change and the loss of biodiversity (Ellen MacArthur Foundation, 2014) .

It is in this context that the **circular economy** appears, since it represents an opportunity to change our production and consumption model, as well as to significantly impact the achievement of the Sustainable Development Goals (UN, 2015). This is thanks to the fact that this new production model makes it possible to improve the efficiency of resource use and works to minimise the generation of waste and reintroduce it back into the production cycle thanks to a regenerative vision based on innovation, collaboration and awareness (Ellen MacArthur Foundation, 2014). The difference between linear and circular economy is key to the environment.

Reverse logistics is a key element in the circular economy, a new type of logistics that ensures the recovery of materials already used. Although there are many companies from different sectors that are already leading the transition to a circular economy and applying reverse logistics, there is still a long way to go to achieve a circular ecosystem (Ruiz, 2018). Despite the benefits, the application of this model can be slowed down or even

rejected by companies, as it requires several changes that companies are not always prepared to face.

Taking into account the previous aspects, insofar as this can contribute to facilitating the development of business models based on the circular economy, the objective of this work are to deepen into the knowledge of reverse logistics and the barriers that companies usually face when it comes to implementing it correctly in their production processes and to illustrate how a specific firm develops its reverse logistics. In order to achieve these objectives, in the first part of the work we will delve into the concept of reverse logistics and examine the dimensions or elements that make up reverse logistics in the company. Next, we will review the possible barriers that companies have to face when incorporating reverse logistics. In the second part of the work, we complement this theoretical review with a case study in which we describe how a company with a strong commitment towards sustainability issues implements its reverse logistics. Specifically, the work analyses the process and environmental initiatives carried out by the company Danone in its reverse logistics.

2. REVERSE LOGISTICS CONCEPT

There have been several definitions of reverse logistics over the years and different authors have offered their own approach. Below, we will see the evolution that has taken place in these definitions over time, in the hands of the most important authors specialised in reverse logistics.

In 1992, James Stock defined reverse logistics as the recovery of waste originating from a productive or consumer activity. Therefore, it is in charge of the recovery and recycling of containers, packaging and hazardous waste, as well as the processes of return of excess inventory, customer returns, obsolete products and seasonal inventories. It is a way to return materials that are reused, recycled or destroyed.

Kopicky et al (1993) referred to reverse logistics as a term for the management and disposal of all types of (hazardous and non-hazardous) product and packaging waste. Also included is the reverse distribution of goods and information in the opposite direction of normal logistics activities. In their study they also included a number of important decisions in each part of the implementation process, among them some such as the analysis of the entry barriers, collection management, sorting or placement.

Rogers and Tibben-Lembke (1999) also offered their own definition of reverse logistics based on the definition given by the CSCMP (Council of Supply Chain Management Professionals): "Reverse logistics is the **process of planning, implementing and controlling the efficiency and effective cost of the flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin**, with the objective of recovering value or disposing of them properly" (Rogers and Tibben-Lembke, 1999, p. 16).

Subsequently, Fleischmann (2000) described it as a process of logistics activities ranging from products that can be brought back to the market to those no longer needed by the consumer. In addition, he compiles a set of quantitative models designed for the analysis of the reverse function of logistics, which are grouped into the following categories: distribution systems, inventory management and production planning models.

Another more recent definition is that one offered by the Council of Supply Chain Management in 2013, where it is defined as a specialized segment of logistics that focuses

on the movement and management of products and resources after sale and after delivery to the consumer, including returns for repair or reimbursement. In other words, any process or management after the sale of the product would involve reverse logistics. The process in the product travels backwards through the supply chain network to retain any use of the defective product, the logistics for such issues is reverse logistics.

From all these definitions we can synthesize the concept of reverse logistics as the process aimed at the recovery of waste from the market, with the aim of recovering its value or for its proper disposal. It is worth highlighting the fact that this process contains a double component by which it covers both environmental and productive tasks for the company.

3. BASIC DIMENSIONS OF REVERSE LOGISTICS

For a good understanding of what reverse logistics is, De Brito and Dekker (2003) present a content framework focusing on the following questions with respect to reverse logistics: why? what? how?; and who?. With it, they aim to explain which are the driving forces and return reasons, what productes, how are they being recovered and who is involved.

3.1 Reasons for reverse logistics (Why)

This dimension encompasses two simple questions, on the one hand **why the product in question is being returned**, and on the other hand **why the company decides to accept this return**. To answer these questions, the reasons can be identified by taking into account two criteria: the stage of the value chain where it occurs and the nature of the reasons.

When we look at the stages of the value chain where it is produced, there are four possible reasons for wanting to return a product (De Brito and Dekker, 2003). Firstly, it may arise during the production process, due to the fact that it is given with materials that are not finally used during the process, to products that do not pass the quality controls required to be able to go to market or to finished products that are no longer necessary for the manufacture of the final product. Secondly, it may arise during the distribution process, where the operation would be carried out between the suppliers themselves and the producers. This may be due to safety issues, the need to make inventory adjustments or for products such as pallets. Thirdly, it can occur between vendors and manufacturers. Finally, we have the situation where it is the consumer who returns the product, either because of the need for a repair or because the life of the product has come to an end.

Companies accept this return of waste for three main reasons (De Brito, 2003): economic, legal and social responsibility.

- The economic reasons reflect the fact that, thanks to this process of reuse and recovery of materials and products, the company can face lower production costs, reducing the use of raw materials, adding value with recovery and reducing disposal

costs. In fact, companies can also expect indirect gains from the competition, by undertaking recovery in order to prevent other companies from obtaining their technology or preventing them from entering the market, and from the strategy, by initiating an image construction in front of consumers.

- The fact of incorporating these activities to the company makes it comply with the laws in force. It even means anticipating future environmental legislation, which will become more restrictive over time as a result of accelerating global warming, increasing waste and for the protection of consumer rights. In addition, in recent years Europe has been particularly demanding in establishing new laws relating to the environment, such as recycling quotas, packaging regulations and producer responsibility.

- In reference to social responsibility, companies often use the term to express their respect for society for good principles. It represents the feeling of the company socially driven to act in a certain way, it concerns a set of values or principles that drive a company or organization to commit itself responsibly to reverse logistics. In fact, many companies have extensive programs of responsible corporate citizenship in which social and environmental issues become the priorities.

3.2 Products affected by reverse logistics (What)

Normally the term reverse logistics is associated with the return of products, but the reality is that the process can be carried out not only with the returned products, but also with the packaging. In fact, packaging forms a very powerful and important group in consumption, which causes a great environmental impact if it is not disposed of correctly. Therefore, the reverse logistics process is aimed at both products and product packaging (Hortal, 2011).

It must be considered what is really being discarded or returned, taking into account all the properties of the products; their size, weight, value, ease of transport, etc. The type of product is the first overall impression of the potential state of the product when it reaches recovery. Fleischmann et al. (1997) distinguish the following types: spare parts, packaging and consumer goods. Therefore, following the analysis carried out by De Brito and Dekker

(2003) we can classify the returned products into three groups based on their characteristics: the pattern of use, the composition and the deterioration.

1. **Usage pattern:** refers to the location of the product, the degree of effort to be made to collect it, the intensity and time of use. It is an important group of characteristics since it affects the collection phase. The pattern will be different if the end user is an institution, which will tend to a massive use, or is an individual. This will result in different collection sites and different levels of effort by the end-user. It should be considered that the degree of consumption during use is not the only component that describes the intensity of use, but also the time. Naturally, the pattern of use will be different between consumer goods and industrial goods.

2. **Composition:** when designing products for recovery, the composition of the product in terms of the number of components and materials plays a fundamental role (Gungor and Gupta, 1999). The intrinsic characteristics of a product that are decisive for recovery are homogeneity, dismantle ability and comparability, as they affect the economy of the whole process. In order to facilitate the dismantling and reprocessing of products, not only the number but also the way in which they are assembled will be important, and therefore the economics of reverse logistics activities will also be affected (Goggin and Browne, 2000). The same applies to verifiability, as the detection of hazardous materials is of paramount importance, as they require special treatment. On the other hand, one can try to separate material flows by checking the heterogeneity of the materials of the products being treated. Another factor identified as important for recovery systems is the size of the product (Goggin and Browne, 2000).

3. **Deterioration:** it is necessary to check whether the product has aged in its entirety or only some parts of it in order to know whether it is worth recovering, whether it needs some repair or, on the contrary, whether it is absolutely obsolete. Several questions should be asked to evaluate the potential for recovery: does the product age during use? (intrinsic deterioration); do all parts age equally, or not? (homogeneity of deterioration); does the value of the product decline rapidly? (economic deterioration). Deterioration sometimes means that the product cannot be used again, but it also determines whether sufficient functionality remains to make further use of the product, both as a whole and in parts. In some cases, products become obsolete due to the appearance of newer models on the market, in which case the recovery options are conditioned by economic viability. Another case is that of

products that are totally consumed during use (e.g. petrol) or if they age at high speed (e.g. battery), in these cases the re-use of the product is not considered an option. However, recovery or replacement of parts is considered an option when only part of the product is damaged.

Table 1 shows the described characteristics related to products returned:

Table 1. Features of the products to be considered for return.

Features	Description
Usage pattern	- It affects the collection phase - Depends on the type of user - Different collection points - Different degrees of effort - Different between consumer goods and industrial goods - Consumption rate - Time
Composition of the product	- It affects recovery - Important for the economy Characteristics: - Homogeneity - Dismantling - Verifiability
Deterioration	It affects recovery Types: - Intrinsic Deterioration - Homogeneity of deterioration - Economic downturn

3.3 Activities in reverse logistics (How)

Currently, the perception of product returns must be changed as they are considered an unavoidable cost for companies, since **the returns must be seen as new material** that enters the company and for which income will be generated later. All enterprises, and particularly manufacturers of high-technology products, have many options for re-engineering their logistics and production processes (Honorato, 2016).

The **first step** in generating a closed supply chain is the determination of the current capabilities for managing returned products along with the identification of the necessary capabilities to be acquired to improve business processes (Wattanajantra, 2019). This chain will be necessary to obtain additional profits through recovered components and the reuse of inputs, the resale of refurbished or remanufactured products and the positioning in the market as an environmentally responsible company

It is important to highlight the different scenarios in which the process of reverse logistics activities takes place. According to Krumwiede and Sheu (2002) the classification of the reverse logistics process can be done in three different scenarios: recovery, transport and disposal.

- **Recovery**: it consists of the collection of the product from the point of consumption, both from the consumer and from a shop or a collection centre. It includes the guarantee of the damaged products and those withdrawn from the market.

- **Transport**: once collected from the point of consumption, the supply chain is redirected. The product can be returned to its place of manufacture or to companies specialized in the management of such products.

- **Disposition**: once the customer's dissatisfaction is known, there are two levels of decisions. The first level refers to actions taken in the presence of the customer, such as a repair or replacement. The second level consists of sending the defective product to the corresponding facilities for repair, replacement of parts, inspection or improvement. Always with the aim of avoiding its disposal. It may be the case that the product ends up being sent to settlement centers or outlets.

With regard to the specific activities that form reverse logistics, according to Rogers and Tibben-Lembke (1999), they reverse logistics activities can be **classified according to the type of article, distinguishing between products and packaging** (Table 2).

Table 2. Classification of activities related to reverse logistics

Article	**Products**	**Packaging**
Activities	❖ Return to supplier ❖ Merchandise qualification ❖ Material recovery ➢ Refurbishment ➢ Cannibalization ➢ Recycling ➢ Removal	❖ Material recovery ➢ Restoration ➢ Reuse ➢ Recycling ➢ Reciclaje ➢ Removal

Source: Own elaboration based on information from Rogers and Tibben-Lembke (1999).

Product related activities are grouped around the return, sorting and recovery of materials:

- **Return to supplier:** this is the first step in the process, the withdrawal of the product from the market. The reasons for a return or inverse logistics can be varied, however, the origin of the error is limited: it can be due to quality, when the product does not arrive in the technical form that the client wants, due to quantity, when the product does not arrive in the number that we requested, or simply due to timing, which means that it did not arrive on time (Carrasco-Gallego, Ponce-Cueto & Dekker, 2012). Customers, through refunding guarantees, endorsements or full exchange discounts, initiate customer returns (Bernon, Rossi & Cullen 2011; Holweg, Teller & Kotzab 2016).

  It is essential that any company that is dedicated to reverse logistics has an efficient and fast order return system, since product returns are the genesis of the RL process (Bernon et al. 2011). The company must manage

customer returns by collecting all returned items at the destination address. This merchandise will then be handled, the stock will be updated and the corresponding credits will be made when appropriate, as well as the exchange of information regarding this return (Badenhorst 2016).

In addition, a return handling policy is of vital importance (Rogers & Tibben-Lembke, 2003). Instructions should be established regarding the process of handling returns, describing how the product should be packaged, how it should be labelled, detailing the reason for the return, clarifying whether the costs are included and providing the customer with a collection phone number, along with any other aspects that may also be necessary.

Today, most companies have an online system that allows the end customer to view the status of their return. On the other hand, reception and collection points are important for the subsequent reverse logistics service. Once the material has been withdrawn, it can be returned to the stock provided that it has been treated as required so as not to present any damage.

- **Sorting of the goods:** the customer's material that has been returned is taken to the relevant facility for inspection, sorting and disposal (Lambert et al. 2011; Rogers, Melamed & Lembke 2012). Detailed inspections will be required to evaluate the quality, once these products are classified they will be returned to stock after receiving the necessary treatment (Akdoğan & Coşkun 2012) and will not present any kind of damage.

  It is important to filter out true returns while efficiently controlling defective merchandise in order to correctly identify items that do not meet the established return requirements, as this allows for appropriate decisions to be made in a timely manner (Agrawal, Singh & Murtaza 2015; Rogers et al. 2012).

- **Recovery:** Products with the characteristics necessary for recovery must meet precise quality standards and often be sold at a lower price than new products in order to increase their attractiveness, making it necessary to significantly improve the efficiency of recovery activities, redistribution and

productivity of work operations (Hazen et al. 2012; Lambert et al. 2011).

It should be noted that modular production can be critical to improving productivity, as it facilitates the disassembly and remanufacture of recovered products by reducing the number of parts used and increasing the interchangeability of parts because more generic modules are handled. This allows the identification and isolation of quality problems, the replacement of complete damaged modules and the reduction of delivery cycles (Parra, 2016).

- **Reconditioning:** Each unit will require reconditioning, which implies having the corresponding packaging and appropriate labels (Arrieta 2015; Dat et al. 2012). On the other hand, it is important to take into account the need to have a space where to handle the goods and personnel with the necessary training to be able to leave the goods as if they had left the factory. Not to mention the administrative activities required. During this process it is important to manage the waste properly, as the product would be removed if necessary.

- **Cannibalization:** This process consists of the search to be able to take advantage of some part of the product. It occurs in situations where complete recovery of the product is impossible, so it seeks to use some of the parts of that product for the development of another (Chan et al. 2012; Lambert et al. 2011). In this way, the company will not have to re-manufacture it, saving costs to the company and reducing pollution.

- **Recycling:** In the recycling process, the aim is to take advantage of certain materials that have already been used as raw materials. For example, small waste materials from manufacturing are returned to the production process, so the savings in the long run would be significant. It is a process that allows the use of waste, thus reducing the volume of waste and the need to use other raw materials, which results in savings of energy and natural resources (Akdoğan & Coşkun 2012; Chan et al. 2012).

- **Removal:** it is not always so easy to recover the product because sometimes it is in bad condition or not safe to consume. Since on these occasions the product has no residual value, is unsalvageable or obsolete, another option must be chosen (Arrieta 2015; Dat et al. 2012). In this case, the objective will be to dump the items in a controlled environment where the waste can be disposed of and covered by the soil in a safe and legal manner (Khor & Udin 2013; Kinobe et al. 2015). Always complying with environmental restrictions and protecting the image of the organization (Kinobe et al. 2015; Rogers et al. 2012). If the products are safe to consume, but the organization has no value to them, they will be donated to charities, welfare organizations or the community, free of charge (Holweg et al. 2016; Negi & Anand 2014).

Reverse logistics activities associated with packaging and hazardous waste are based on the **recovery of materials, through restoration, reuse and recycling**.

For the packaging **recovery** process, it is important that there is a connection between the product designers and the processors. This is because in this way producers can already design the packaging from a commercial perspective, ensuring the quality of the packaging and always ensuring compliance with environmental and logistical issues, being the link between both (Arango et al. 2019). Packaging and the material used for transport during reverse logistics activities are usually reused before being discarded (bags, pallets, etc.). In order to establish the packaging collection system, it is essential to have the information on the characteristics of the packaging, as this will allow a correct classification according to the treatment required.

There are several options, one of which is for the company to choose to create and use returnable packaging, which can have several uses after it has been used by consumers. If it chooses this option, the company has the option of using its own resources for the collection and further processing of the packaging. In this way, it would recycle such packaging that has reached the end of its useful life by applying the appropriate treatment for its subsequent reincorporation into the production process as new raw materials. However, if the company does not have the necessary resources to carry out this treatment with its own resources, or simply prefers not to do so with its own resources, it can opt to subcontract it to other companies responsible for recycling.

3.4 Systems and types of networks (Who)

The systems are necessary to be able to manage the different tasks carried out by the reverse logistics. It refers to those that intervene at some point in the whole process, either during the chain, carrying out each of the activities or sending the product. For this reason, we speak of actors belonging to both the forward and backward supply chains, government institutions and opportunistic or advantageous actors (De Brito, 2003). We are going to classify them according to who manages them, since they can be managed both by the company itself, using its own resources, and by another external company (Rubio, 2003):

- The company's own systems: in this first case it is the company itself that uses its resources to design and manage how the process of recycling and reusing products will be carried out. These companies share some common characteristics: they have the advanced technology required for value recovery processes, they are usually market leaders and they are manufacturers of complex products. Although these companies carry out this process, there is the possibility that they subcontract other companies to carry out some tasks (e.g. transport). Once the recovery process is completed, the product will be incorporated back into the original supply chain, which is known as the closed-loop supply chain.

- External systems: when the product recovery process is carried out by an external company. In this case two options are possible:

    - Companies specialising in reverse logistics: this option is usually available when the company aims to comply with current legislation on hazardous waste and, in the case of returns, with customer service. To do so, they need simple logistics networks with few links. It is also possible to find cases in which companies are additionally responsible for controlling and managing normal logistics, not just the reverse (Rubio, 2003).

    - Adhere to an Integrated Management System (IMS): which refers to an organization in charge of managing the recovery of the products or, failing that, eliminating it following the appropriate procedure. To opt for this option, the products are usually homogeneous, of little value and little complexity, and from which parts of the material are usually recovered. The logistic

network used is also of few links. On the other hand, the products that have been recovered do not have to become part of the original supply chain. Some examples of GIS available in Spain are ECOEMBES, ECOPILAS or ECOVIDRIO.

According to Fleischmann et al (2000), it is possible to classify the networks in the product recovery process according to the way the returned product is processed. This classification identifies three different networks, however, it is possible to create a mixed network that includes different networks in turn.

- **Reusable product networks**: this option refers to systems whose collected products or packaging can be directly reused. In this case, the network to be formed will be much simpler than in the other cases due to the good condition of the products. For this reason, the treatment of the product will be based solely on its inspection and cleaning, so its main cost will be transport. In order to reduce this cost as much as possible, it is advisable that the terminals where these tasks are carried out are as close as possible to the consumer. In this way, not only will this cost be reduced, but we will also reduce another important factor: time, by offering a better service to the customer. On the other hand, containers and packaging are other recoverable elements, so those that are in good condition after use can avoid one of the highest costs of the products, the purchase price.

- **Wholesale recycling networks**: in this case the value recovered from the products is very low, because the recovery of the materials is of a very low value. On the other hand, since the use of specialized machinery is required, a large investment is necessary. In addition, economies of scale are needed to be able to process large quantities and to be profitable. In order to be able to secure a large volume of products to be processed, it would be interesting to be able to obtain a network of subsidiaries that cooperate with each other in recycling, which could be more beneficial.

- **Assembly product manufacturing networks**: use of products or components thereof already used with a relatively high value with the aim of creating other products with the highest possible value. Therefore, the creation of a series of interrelated processes is needed, with special attention to the intermediate network between collection and redistribution, and taking into account the uncertainty caused by the different states in which the arrived products or materials can be found.

4. BARRIERS TO THE IMPLEMENTATION OF REVERSE LOGISTICS

Since reverse logistics is a relatively new concept in the daily life of companies, it has not been possible to carry out many studies on this subject, as if it were traditional logistics (Badenhorst, 2016). As we have seen previously, it was not until the end of the 20th century that these first definitions and analyses on the subject began to appear. This lack of knowledge complicates, to a certain extent, the correct implementation in companies, as there are not many precedents that can serve as a guide.

A number of aspects need to be taken into account when deciding what the characteristics of the reverse logistics system will be, such as facilities or location, integration with the main supply chain, structure of the supply chain and the volume of returns to be faced (Pishvaiee et al, 2010).

It is necessary to estimate the time that the different tasks will require to be completed in order to allocate the exact resources that will be used to carry out the activities, the number of people that will be dedicated to it and then the budget needed to fulfill its objectives (Ballesteros Riveros and Ballesteros Silva, 2007).

According to Lombaard et al. (2017) we can find two types of barriers to reverse logistics practices:

- Internal barriers: refers to the company's internal difficulties in correctly applying reverse logistics.

    - Firstly, there may be a situation where there is a lack of communication and cooperation between workers and management, so the company would be faced with a **lack of functional integration**. The objective in this case would be the organisation of all the functions for their correct collaboration as a single entity, ensuring that the results are achieved jointly, contributing to the continued success of the reverse logistics. Badenhorst (2013) presents the option of establishing competing objectives across departments in the case where the functions involved in reverse logistics do not understand the final objective of the latter.

- Secondly, since reverse logistics is a relatively new and unfamiliar term, it is often the case that **senior managers** of companies do not commit themselves to this practice because they are not aware of the resulting benefits that could accrue. This is a determining factor, as it is the management that makes the decisions that allow the appropriate resources to be dedicated to the effective performance of reverse logistics practices. For this reason, in order to obtain organizational benefits in the practice of the RL, it is necessary that all of the company's top executives be personally committed and responsible for the creation and application of these practices, placing them strategically in the organization.

- On the other hand, there is the possibility of insufficient capital and funds for surveillance, storage and internal handling systems, so we face **financial barriers**. Local Risk Management practices represent a precarious effort for top management, as they require a financial effort that can affect the company's long-term performance. According to Bernon et (2011) it is necessary to have information systems that require large amounts of capital and resources to implement and maintain, but which are fundamental for the tracking and tracing of returns and recoveries in order to achieve successful operations. Thus, the successful practice of Local Risk Management operations not only requires trained personnel, but must also be accompanied by financial support.

- Finally, the company needs a planning and investment strategy regarding the product return system. The **lack of sufficient information systems** to effectively transfer product return information between the parties involved acts as an important barrier to the RL. Consequently, the response capacity of the partners and the quality of the data are affected when returns have to be handled manually. For this reason, the creation of an easily accessible shared platform will be necessary to ensure the integrity and coherence of the Local Distribution Network process. On this platform, supply chain partners can share all necessary information about customers, inventory and logistics (Lambert et, 2011).

- External barriers: when the difficulties in carrying out successful reverse logistics activities come from outside the company.

- First of all, it is important to emphasize the need for close and integrative relationships in the supply chain between partners, since they are said to be the motivators of Local Risk Management practices (Ho et, 2012). For this reason, the **integration of supply chain partners** is necessary. This integration refers to the integration between a company and its external environment, which can take place at different levels of the supply chain (Bernon et, 2013). Once what can be considered one of the main barriers to Local Risk Management (the non-cooperation of supply chain partners and organisational policies) have been eliminated, the possibilities of effective Local Risk Management practices will be much greater (Ho et, 2013). A great deal of effort, time, and money is required to create and maintain a system of order return. This system is based on collaboration and integration of the supply chain in order to act effectively.

- Secondly, the lack of an accurate forecast among supply chain partners can be a major obstacle to the Local Network. The **lack of accurate forecasting** leads to difficulties in calculating quantities and planning the diversity of products that will flow through the reverse chain (Cardoso et al., 2013). The most common aspect in the practices of the Local Network is returns, but these in turn provoke uncertainty in the organization due to the unknown moment, condition, disposition, quality and quantity of returns (Badenhorst, 2013). Another factor that creates such uncertainty is infrequent and erratic time patterns. On the contrary, all those decisions that are made accompanied by precise information have a high level of effectiveness in the management and improvement of product flows, thus allowing for a more efficient Local Network (Govindan et al. 2015). Therefore, efficient information systems are necessary to have the necessary visibility to reduce forecasts and uncertainty (Rahman & Subramanian, 2012).

- Finally, **government support and policy** play an important role in the organization's Local Risk Management practices, since the lack of applicable environmental laws established by the government reduces the incentive and motivation for organizations to carry out Local Risk Management practices (Ganjali et al. 2014; Ho et al. 2012). Conversely, without government fiscal policies and financial support, a disincentive would be created for organizations to invest, as products brought back into the reverse chain create high degrees of complexity and fiscal exposure (Abdulrahman et al.

2012). For this reason, the government is the body with the greatest strength when it comes to exerting external influence on the process of the Local Enterprise Network in organizations (Lai & Wong, 2012).

In summary, this section has identified the main barriers to the introduction of the reverse logistics system in the company's activity. As far as internal impediments are concerned, the company may find itself in four situations that make its implementation difficult: lack of functional integration, lack of commitment from top management, financial barriers and lack of information systems. In the case that the company faces external barriers, these can be due to three situations: lack of integration of the partners in the supply chain, lack of precise foresight and lack of support from government policies.

5. CASE STUDY: DANONE

5.1 Methodology

The methodology we have used for the second part of the work is the case study. The case study consists of a research method characterized by the need for a search and inquiry process, as well as the systematic analysis of one or more cases. This methodology differs from others in that it is considered a qualitative research technique because it focuses on the comprehensive study of a phenomenon. And not on the statistical analysis of already existing data (Martínez, 2006). The case study method is a valuable research tool, and its greatest strength lies in the fact that through it the behavior of the people involved in the phenomenon under study is measured and recorded (Yin, 1989). The data are obtained from documents, records from archives, direct interviews, direct observation, observation of participants and physical facilities or objects (Chetty, 1996).

In this case, we have used Danone as the object of study. Our objective is based on examining the application of the concepts identified in the theoretical framework to the elements of the reverse logistics in this specific context. We adopted a qualitative and secondary data collection system based on the reports and policies published by the company as well as the information provided by the B Corp movement, from which our company is certified for its social and environmental commitment, as well as its excellence in business management performance.

Table 3. Danone reports used as data sources.

Danone reports
Packaging Policy report year 2018
Climate Policy year 2018
Environmental Policy year 2018
Sustainability Strategy report year 2018
Health and Environmental Commitments year 2018
Sustainability Reports year 2016

5.2 Description of the company

Danone is a French agri-food multinational based in Paris, France. It was founded in 1919 by Isaac Carasso in Barcelona as a small artisan yogurt factory. At the beginning, Danone only produced in the city of Barcelona. The company's first success was the launch of flavoured yoghurt. In 1929, the company moved to Paris, where it built its first large factory. Since Carasso's son, Daniel, took over the running of the factory, its growth has been very fast.

Its activity is based on four main businesses: medical nutrition, child nutrition, fresh dairy products and water. The company operates in more than 120 markets and generated sales of 27 million euros in 2017 (Danone, 2018). Dairy and plant-based products accounted for 52% of the company's sales in 2017, while specialist nutrition accounted for 29% and water 19%. Danone has become the brand with the best reputation thanks to its constant innovation and the high quality of its products. Launches such as Petit Suisse, Actimel and Danacol have boosted its success and helped maintain consumption of Danone products despite the rise of private labels.

Danone bases its way of doing business on achieving a **sustainable transformation** and assuming a **social responsibility** that goes far beyond the mere economic objective. Since 1972, it has had a dual economic and social commitment. In that year its president Antoine Riboud redefined the traditional company approach and since then, the company's own economic growth goes hand in hand with social growth: "There is only economic growth if it goes hand in hand with social growth" (Antoine Riboud, 1972). its mission and vision, as it can be in Table 4, stress this sustainable and social commitment, as its concern for the natural resources and health are driving the statements.

Table 4: Danone's mission and vision.

MISSION	VISION
To bring health through food to as many people as possible.	Bringing a healthier diet to more people while using natural resources sustainably

Source: Own elaboration based on Danone Sustainability Report, 2018.

As a consequence of it, Danone has a strong reputation on sustainability and social values and has won a number of awards over the years thanks to its work in environmental protection, innovation, promotion of healthy habits and its efforts to create products that maintain safety standards. As an example, some of the awards it has received are:

- European Environment Awards (2014), for the use of more sustainable materials
- Ecoembes R Awards (2013) for the use of more sustainable materials
- Andalusia Environment Awards (2013) for its environmental track record.
- Association of Forestry and Landscape Companies of Andalusia Award in the category of "Business Commitment to the Natural Environment and Andalusian Landscape" for the project "Mount of the 21st Century (2010).
- Granada Business Association Awards (2012) for their actions in the Environment.

Danone's concern for these issues led him to sign and subscribe to the Global Compact in 2003, a United Nations instrument that was announced by the United Nations Secretary-General Kofi Annan at the World Economic Forum at its annual meeting in 1999. Its objective is based on promoting Ten Universally Accepted Principles to foster sustainable development in the areas of human rights and business, labour standards, the environment and anti-corruption in the activities and business strategy of companies.

Additionally, this form of business has brought them together with B Corp, a global movement which helps them measure progress on their social and environmental goals, as well as offering new ways of communicating with consumers and working on the company's model of transparency. Together with B Corp, they have set a long-term goal for 2030, which aims to create sustainable values across the company. All its objectives are aligned with the 17 Sustainable Development Goals (SDA) of the United Nations Agenda for 2030. Danone has been the first mass consumer company to be certified as a B Corp in our country.

In 2016, it published its Packaging Policy, updated in 2018, with a commitment to sustainable materials and creating a second life for all plastics. In it, they describe their ambition to create a circular packaging economy by solving the challenges presented, finding smarter solutions to improve the benefits of packaging, while reducing its cost and environmental impact. The three guiding principles of this policy are to work at the pre- and post-life cycle levels of packaging, to combine continuous improvement and major innovations, and to build coalitions to increase local waste management solutions.

Since then, they have continued to work and strive to design circularity into all their products, investing in innovative technologies, eliminating production waste and improving collection and recycling systems.

5.3 Analysis

In this section we examine the elements of the reverse logistics at Danone by taking into account the dimensions by Brito and Dekker described in the first part of the work. To do so, we will first review the reasons, then what products are included in their reverse logistics, the activities they carry out to do so, and finally who carries them out.

5.3.1 Reasons (Why)

The first of the dimensions of reverse logistics refers to why the company decided to implement the system in its production process. An examination of its reports shows that the main reason that led Danone to adapt the reverse logistics system was social responsibility. The company believes in economic and social value by creating food that nourishes and preserves natural ecosystems. That is why in 2015, at the COP 21 in Paris (Conference of the Parties to the United Nations Framework Convention on Climate Change, whose main objective is to reach a new international climate agreement planned for after 2020), Danone presented its goal of pursuing a climate policy based on two phases: reducing emissions by 50% by 2030 and achieving zero net emissions by 2050. In order to fulfil this commitment, Danone Spain has drawn up and implemented a strategic plan to reduce its impact on the environment and, in turn, to establish projects with a positive impact from its area of direct responsibility as well as from its area of shared responsibility. To this end, it focused on 4 main areas: the fight against climate change, preservation of the water cycle, promotion of sustainable agriculture and development of **projects for the circular economy** in its packaging.

As an example of this environmental commitment, the company acts conscientiously throughout its value chain, with the aim of reducing the impact of its carbon footprint. To this end, it has incorporated responsible management in all phases of its production process, from the supply of its raw materials to the management of the waste it generates, impacting all acts of its ecosystem during the process.

Obviously, legal reasons have also had an influence, since it is worth noting that in the European Union it is compulsory by law to collect the materials and packaging used by the company to transport its products (Directive 94/62/EC). As a result of this directive established by the EU, Spain has developed in recent years a set of rules and laws that try to achieve these objectives. Similarly, the various Autonomous Communities have incorporated these environmental considerations into their regulatory repertoire. All these laws and regulations are based on the hierarchy for waste management established by the European Union: prevention, recovery and disposal.

5.3.2 Products (What)

The second dimension of logistics concerns products. Here, Danone focuses mainly on the recovery of all waste from its manufacturing plants and its packaging. In relation to the waste generated by its production plants, Danone's objective is based on five hierarchies: reducing the amount of waste produced, reusing materials, recycling materials to make new products, recovering energy from waste, and safely disposing of waste that cannot be recovered. They have managed to ensure that 100% of the waste generated at their dairy factories in Spain is recycled and reused as raw materials (Danone Sustainability Report 2018, page 46). All suitable plastic waste is recycled for new plastic uses, while the rest that cannot be reused is converted into organic material. As an example of the former, the result of this effort has generated the manufacture of more than 50 million BIC pencils per year, hangers for different commercial brands or parts for small household appliances as a result of the conversion of their plastic waste.

Table 5. Types of products and packaging involved in the RL at Danone.

Resources	Packaging
- Use of sustainable resources, increasingly trying to use biomaterials	- Creating a second life for all plastics - Monitor the weight ratio of your packages to find ways to optimize

- Promoting the responsible development of plastics based on materials of biological origin - Target of zero plastics from industrial waste at the landfill - Actively reduce the weight of paper and cardboard used in packaging for each product - Give priority to the use of fibres recycled, if not possible, give priority to the use of FSC-certified virgin fibre	package performance at lower weight to drive design with value - Develop the concept of Recyclable by Design with external experts - EcoDesign tool for all your packaging (innovations and renewals)

Source: Danone Packaging Policy, 2016.

5.3.3 Activities (How)

As for the third dimensions of reverse logistics, we find the activities carried out by the company to complete the process and who performs them. Packaging is an important part of Danone's products because it is impossible to supply dairy products without it. Danone works in different projects of circular economy.

To carry out their **strategy of circular economy**, they act in the whole value chain:

1. **Use of sustainable resources**: the aim is to use **raw materials** that are as sustainable as possible for the creation of their **packaging**. In the Water division, they are working on the increasing incorporation of the percentage of recycled PET in their formats. Therefore, it manufactures its packaging from more renewable and recycled resources.

2. **Creation of a second life for its plastics:** to this end, they have created the **Renueva** project, which is based on the recovery of those materials (mainly plastic) that the Water division places on the market to give them a second life, reincorporating them into its value chain by recycling and reusing them. In addition, the project will also enable them to create new jobs, training and capacity building for

people at risk of social exclusion, while raising awareness of the importance of recycling in society with the aim of avoiding littering or abandonment of waste. The company's commitment for 2021 through this project is to achieve the amount of 1700 tons of recycled PET (RPET) and recovered.

Collaboration with the Trinijove Foundation in the Renueva project, which, in turn, also expects the creation of 32 direct jobs and the training of 240 people. In turn, this project has obtained collaboration for the construction of the Montcada i Reixac container separation plant of the Trinijove Foundation. This is a pioneering project and a reference in the field of circular economy, as it is the first training of the Recycling School.

3. **Ecodesign applied to packaging:** Danone works on minimizing the impact during the entire life cycle of the packaging, always meeting the demands of the consumers while complying with all the quality and food safety requirements as well as the environmental ones. Therefore, it designs its packaging with the aim of facilitating recovery and recycling by easily separating the different materials. In addition, it innovates its packaging in order to simplify the life of consumers and involve them in separation and recycling. Offering the most viable, desirable and feasible answers. In order to optimize the amount of material used in the production of its packaging it has established criteria such as: the use of recycled materials and the lightning of packaging, reducing its raw material or redesigning the formats. In the Water division, numerous eco-design projects have been carried out.

Packaging plays a fundamental role in the company's production process, as it is responsible for protecting the nutritional benefits and quality of the products, while allowing their storage, transport and safe use. However, packaging also presents some challenges because it uses significant resources in its creation and generates waste when not recycled. For this reason, Danone has set itself the goal of creating a second life for all this packaging, along with materials to create this packaging from a sustainable source. In this way, its idea is to establish a model of circular economy with the aim of creating a resource at the end of the packaging's useful life. In order to make the change to this new model from the linear model they had, the company is clear that it must have a **broader thinking together with a different approach to share knowledge, take advantage of collaborations and create partnerships with sectors and organizations that surely would not be related otherwise.**

In conclusion, Danone created this policy to contribute to a healthier future. To build a future where people, nature and business can prosper together, it is necessary to change the way we interact with our resources. "Buying materials responsibly to protect the ecosystems on which we depend is essential, and using those materials more than once means we can do more with less." (Danone, 2016).

The company is also working to **revalue** and **reuse** the destination of these materials, a mission in which industrial waste management, recycling and conversion of waste into raw materials companies are also involved.

Danone's responsibility is to solve all the challenges they face by providing more intelligent solutions in order to improve the benefits of packaging, while reducing both its cost and its environmental impact. This is why **the company's packaging is made from a mixture of fossil and biomaterials**. Once the material is no longer used, an increasing percentage of the waste from these packages is recovered for **recycling** or energy creation, however, more than half still ends up in landfill. To change this fact, the brand has clarified that it requires work within its direct responsibility limits, as well as the generation of solutions from a shared responsibility (Danone Packaging Report, 2015).

For them, the key to the future of sustainable packaging lies in converting this waste into resources by 'closing the cycle', thus ensuring the recovery and reuse of all packaging. This is based on two points of focus for the company:

- Resources used: as mentioned above, the importance of manufacturing packaging from more renewable and recyclable containers.

- End of life: "packaging should be designed to facilitate recovery and recycling by easy separation of different materials" Danone, 2016. At the same time, it also affirms the need for efficient waste collection and treatment systems. This infrastructure will vary around the world, from countries with highly advanced recycling infrastructures to those with little capacity to ensure low levels of recycling. Danone stresses the importance of having economically viable solutions adapted to the context.

The criteria in the Packaging Policy are based on the company's mission: to provide a healthier diet to more people while using natural resources in a sustainable way (Danone Climate Policy, 2019).

Danone's strategy is based on co-creating the circular economy of its packaging by supporting the development of processes and systems that "close the cycle". Because for them the future of packaging must be based on its circularity. In order to cover the whole packaging circle, the company's strategy is based on 5 essential commitments:

- **Use of sustainable resources:** Danone is committed to acting as a catalyst between brand owners, suppliers and technologies in order to accelerate the emergence of 'new generation' plastic materials. In the belief that it is possible to replace traditional fossil materials with plant-based packaging materials. In turn, the company also continues to make every effort to contribute to the emergence of new generations of materials through cooperation with experts and partners that will enable more efficient use of land and resources.

- **Weight optimisation and progress towards the concept of 100% 'circular by design':** the aim of this commitment is the optimal use of materials for industrial-scale operations, significantly reducing carbon emissions in turn. This approach will ensure the circularity of all your packaging designs and processes. In addition, the company has created a tool to help packaging designers develop their packaging with the lowest possible impact on the environment, the Eco-Design tool. One of its main objectives is to develop recycling by design, with external experts, taking into account the specific context of local post-consumption possibilities at the end of life.

- **Zero plastics from its industrial waste in the landfill:** during the company's manufacturing process a large amount of packaging waste is generated, in 2015 the company generated 133,000 tons of packaging waste, of which 83% was recycled or incinerated for energy recovery. The objective is based on the recovery or elimination of 100% of the waste generated, for which it has created a series of alliances and collaborations with its partners to maximize this rate of plastic recovery. In 2016, a target was set for 2020 to achieve zero plastics in its waste in all countries with developed collection systems, and by 2025 in all its factories.

- **Innovation with the aim of simplifying consumers' lives and involving them in recycling:** Danone's packaging objective is not only based on the basic functions of

packaging, but is also intended to encourage consumers to recycle and to inform them how to do so. The company always tries to use the minimum possible amount of packaging, the lowest proportion of food waste and the highest level of consumer satisfaction. By using a number of development tools (market analysis, physical property performance test methods, consumer studies, modelling and simulation...) it can be said that Danone is in the 'green zone', the point where products have neither too little nor too much packaging. On the other hand, other initiatives carried out by the company are to motivate consumers to recycle waste and create new uses for it, using the marketing of its strong brands to inform them of this.

- Co Creating a second life for all plastics: under the thought that every plastic should be used at least twice as a resource, the goal of creating a second life for all plastics arises, with a clear priority for recycling and reuse.

Below is a summary table of the reverse logistics activities carried out by Danone (Table 6):

Table 6. Examples of RL activities carried out by Danone

Activities	Practices carried out by Danone
Reuse	● Creating a second life for your plastics (Renueva project)
Removal	● Zero plastics from your industrial waste in the landfill
Recycling	● Recycling by design (Eco-design) ● Involving the consumer in recycling
Resources	● Sustainable resource use

Own elaboration basis on the information provided by Danone.

5.3.4 Systems and types of networks (Who)

In all of this company's factories around the world, packaging is recycled to varying degrees, driven by different waste recycling infrastructures and cultural and social differences, resulting in the division into two main groups:

- **Organized recycling systems:** in this first group there is a formal and regulated management of the packaging recycling infrastructure, based on professional systems for the recovery and reuse of waste. "Danone takes the opportunity to promote "shared efforts" to continue to improve the efficiency of waste collection schemes and the power of our brands and marketing to engage consumers in seeking to increase recycling rates even beyond current levels" (Danone, 2014).

- **Informal recycling systems:** in the second group, the lack of a formal recycling infrastructure prevails. In this case there is recycling that is carried out by informal collection systems with individuals who are responsible for selecting and selling the waste in recycling operations. This aspect is very relevant for Danone. As it can be seen in its documents, “Danone takes the opportunity to work with local communities to improve informal waste collection, with the government to strengthen the recycling infrastructure and encourage consumer behaviour change" (Danone, 2014).

  "Creating a system that enables all plastics to have a second life will require a 'shared responsibility' approach with consumers, local authorities, waste professionals, NGOs and brand owners to all participate in the recycling chain" (Danone, 2014).

  This commitment can be seen in terms of among the objectives set by the company are: to increase demand for recycled materials by maximizing closed cycles, with the goal of using at least **25% recycled PET in its plastic water and beverage bottles** by 2020 in all countries where regulations and standards allow it; on the other hand, to increase to 33% by 2025 in new countries that allow it; finally, **to ensure that at least 10 priority countries have developed and published their plans and roadmaps for co-creating a second life for plastics by the end of 2017.**

It should be noted that all these objectives will take years to achieve, but they are ongoing objectives that are part of Danone's Packaging Policy. In turn, the company is committed to informing consumers of progress, successes and difficulties through its Integrated Report. In addition, Danone has an organisation dedicated solely to the 'plastics cycle', a dedicated team led by a company Vice President to manage compliance with this policy in plastics. This organisation will be responsible for purchasing management, research and development and end-of-life issues for plastics and packaging.

While the company itself is responsible for carrying out the entire process, with the aim of developing best practices in the circular economy they became a strategic partner of the Ellen MacArthur Foundation, a foundation created in 2010 with the aim of accelerating the transition to the circular economy, which works with governments, businesses and academia to build a regenerative and restorative economy from design.

Finally, a considerable aspect to highlight are the ten challenges that the company set itself as objectives in the 2012 Sustainability Report, which have given way to its consolidation as a sustainable company. All the challenges it set itself have been achieved and extended over the years, until they became part of the company's activity. The ten challenges are presented in table 6 below:

Table 7. Danone's ten challenges in the Sustainability Report, 2012

1	**Be at the service of the consumer**
2	**Responsible communication and listening**
3	**Future nutritional challenges**
4	**Fresh milk from your farms**
5	**Excellence throughout the value chain**
6	**Commitment to the environment**
7	**Leadership and development for all**
8	**Social development with the community**
9	**Research and scientific dissemination**
10	**Healthy habits and values from childhood**

Own elaboration from the Sustainability Report 2012, Danone.

6. CONCLUSION

It is essential to take care of the environment since from it we obtain water, food, fuel and raw materials that are used to manufacture the things we use every day. Therefore, abusing or misusing the natural resources obtained from the environment can endanger it or cause its depletion (Cousteau, 1992). So it is really important that companies act in a sustainable way, in order to create economic, environmental and social value in the short and long term, thus contributing to the increase of welfare and real progress of present and future generations, in their general environment (Fontaine, 2013).

In this work we have raised the relevance of the emergence of the circular economy to change our production and consumption model, an emerging need due to the scarcity of resources and the growing generation of waste that is associated with the current linear economy. Reverse logistics is a key element in the circular economy, which is based on a process of activities aimed at recovering waste from the market, with the objective of recovering its value or eliminating it correctly, contributing to not damaging the environment.

Despite its relevance, this concept is relatively new to companies, given that many of them do not know in depth the advantages and benefits it would bring. In this way, throughout the work we have defined it and examined the different RL dimensions that will help to acquire a better understanding and to correctly carry out its implementation in the activity of the companies.

Thanks to the study of the four dimensions that make up reverse logistics, we have been able to draw some conclusions. First of all, it is important to know the reasons that may interest companies when accepting products from the market. In this way, it may be due to economic, legal or social responsibility reasons. Secondly, companies must explore and know which products they decide to apply the recovery processes to, which may be due to the product that the company itself manufactures or to the packaging used for its production process and subsequent sale. Thirdly, it will be essential that firms do not perceive product return as an unavoidable cost to business, but rather as a new material that enters the firm and for which revenue will be generated later. Additionally, we have differentiated the different activities of reverse logistics that can be carried out according to the type of article, distinguishing between products and packaging. Finally, the company's systems are necessary to be able to manage the different tasks carried out by inverse logistics, referring

to those that intervene at some point in the whole process, either during the chain, carrying out each of the activities or sending the product.

The review of the literature has also allowed us to identify the barriers that companies may face if they do not have adequate knowledge of the benefits of reverse logistics for both the companies themselves and for the environment, thus leading to a failure in its implementation. Therefore, companies should have a profound knowledge of how to carry out this process, taking into account a series of aspects of the aforementioned. In addition, we have found that it is necessary to estimate the time required for the different tasks to be completed in order to allocate the exact resources to each procedure. You should also be aware that you may encounter two types of barriers that may stand in the way of reverse logistics practices. Among the internal barriers, where they may encounter a lack of functional integration if there is no communication and cooperation between workers and management, are that senior management may not be committed to the practice because they are not aware of the resulting benefits that could be obtained from it.

We have examined in depth the case of Danone, a company committed to sustainability and the environment, which assumes a social responsibility that goes far beyond the mere economic objective. The company cannot conceive of economic growth if it does not go hand in hand with social growth. For this reason, we have analysed the different practices that the company carries out, which have allowed us to appreciate its enormous social work and how it successfully carries out all its reverse logistics activities with enormously satisfactory results. Therefore, it is a reference model for the study of applied cases of reverse logistics. It is a good illustration of how reverse logistics can be implemented in a company, since it not only carries out practices of packaging recovery or waste reduction, but also strives to make its workers and consumers aware of changing their lifestyles by contributing to reducing damage to the environment.

Danone is dedicated to the marketing of dairy products and beverages made from sustainable resources. With its activity, it aims to make a profit and at the same time dispose of waste in the world. In addition to having an innovative business model based on its value proposition, Danone promotes positive social and environmental change as an organizational objective, maintains relationships with suppliers, employees and customers, and interacts with the market, the competition and the industry. Specifically, the way it promotes positive social/environmental change as an organizational objective is seen in its sustainability reports where environmental objectives are integrated into the control of its production process. With regard to the interaction that Danone has with the market,

competition and industry, it should be mentioned that the organisation wants its business model to serve as an example that profits can be made and at the same time contribute positively to society and the environment. For this reason, Danone continuously motivates its consumers to recycle through its packaging.

From our analysis, we can infer some implications and management recommendations for the company. The company could invest more in marketing campaigns to encourage people to recycle, in addition to showing them all the sustainable practices your company has in place. One way of doing this would be, for example, to run campaigns where they could bring people and recycling together, encouraging them to recycle in exchange for products made from recycled materials.

This work has a number of limitations, related to the accuracy of the activities carried out by the company, as it does not provide detailed information on how it carries out the reverse logistics practices, due to the fact that in its reports it does not specify the processes, but rather the initiatives and results. On the other hand, we would also like to indicate that we have tried to collect evidence regarding the barriers in Danone for the implementation of the reverse logistics activities in its product process, but this has not been possible as the information extracted has been from secondary sources. However, Danone refers in its reports to the need for a change in mentality for the correct functioning of sustainable practices, as it is necessary to assess the need for them in order to believe in their results. Future work should or could try to show the difficulties that a change in the company can present by initiating the development of sustainable activities, as it could help to motivate companies by showing them the great benefits it would bring in the long term. Without this, companies could be demotivated and abandon reverse logistics practices if they do not see results in the short term and only perceive an increase in costs.

Finally, we would like to point out that the work done allows for future extensions related to sustainability. Data collection could be improved through interviews with managers and staff of companies that increase the quantity and quality of information collected. Similarly, the information gathered in this document could be used as a basis for future research studies, such as the study of circular economy models.

7. REFERENCES

- Ballesteros, D. and Ballesteros, P., 2007. *Importancia De La Logística Inversa En El Rescate Del Medio Ambiente*. [online] ResearchGate. Available at: <https://www.researchgate.net/publication/26612671_Importancia_de_la_logistica_inversa_en_el_rescate_del_medio_ambiente> [Accessed 22 April 2020].

- Carmona, A., 2018. *La Gestión De La Logística Inversa - Meet Logistics*. [online] MeetLogistics. Available at: <https://meetlogistics.com/cadena-suministro/la-gestion-la-logistica-inversa/> [Accessed 23 March 2020].

- Cousteau, J.Y., 1992. ENVIRONMENTAL IMPACT. THE WOUNDED PLANET. [online] Available at: <https://www.mheducation.es/bcv/guide/capitulo/8448167155.pdf> [Accessed 17 March 2020].

- Cscmp.org. 2013. *Council Of Supply Chain Management Professionals*. [online] Available at: <https://cscmp.org/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.aspx?hkey=60879588-f65f-4ab5-8c4b-6878815ef921> [Accessed 22 March 2020].

- Daniel, V., Guide, R. y Van Wassenhove, L. (2002). Closed-loop supply chains. Lecture Notes in Economics and Mathematical Systems, vol 519. Berlin. Doi: 10.1007/978-3-642-56183-2_4

- De Brito, M., 2004. *Managing Reverse Logistics Or Reverse Logistics Management?*. [online] Doctoral thesis. Erasmus University of Rotterdam, The Netherlands. Available at: <https://www.researchgate.net/publication/34742326_Managing_reverse_logistics_or_reversing_logistics_management> [Accessed 25 March 2020].

- Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on the general environmental action programme of the Union until 2020 "Living well, respecting the limits of our planet Official Journal of the European Union, European Union, 28 December 2013

- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives. Official Journal of the European Union, European Union, 22 November 2008.

- Directive (EU) 2018/852 of the European Parliament and of the Council of 30 May 2018 amending Directive 94/62/EC on packaging and packaging waste. Official Journal of the European Union, European Union, 14 June 2018.

- European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste Official Journal of the European Union, European Union, 31 December 1994

- Fleischmann, M., Bloemhof-Ruwaard, J.M., Dekker, R., Van der Laan, E., Van Nunen, J.A., Van Wassenhove, L.N. (1997). "Quantitative models for reverse logistics: a review. European Journal of Operation Research, 103, 1-17. Available at: <https://repub.eur.nl/pub/2244/eur_dekker_65.pdf> [Accessed 24 April 2020].

- Fleischmann M. (2000). Quantitative Models for Reverse Logistics. PhD thesis. Erasmus University of Rotterdam, The Netherlands. Available at: <https://repub.eur.nl/pub/1044/EPS-2000-002-LIS+FLEISCHMANN.pdf> [Accessed 24 April 2020].

- Fontaine, M., 2013. Corporate Social Responsibility And Sustainability: The New Bottom Line?. [online] Ijbssnet.com. Available at: <https://ijbssnet.com/journals/Vol_4_No_4_April_2013/13.pdf> [Accessed 22 April 2020].

- Genchev, S.E. (2009). A reverse logistics program design: a company study. Business Horizons. 52(2), 139-148. Doi: 10.1016/j.bushor.2008.09.005

- Grupo, C., 2018. *Logística Inversa: Concepto, Tipos Y Utilidad*. [online] Available at: <https://blog.controlgroup.es/logistica-inversa-concepto-tipos-utilidad/> [Accessed 22 April 2020].

- Gureakmarketing.com. 2020. *La Logística Inversa - Gestión De Devoluciones*. [online] Available at: <https://www.gureakmarketing.com/es/blog/27-marketing-relacional/188-logistica-inversa-stock-mercancias> [Accessed 22 April 2020].

- Hansen, Z.N., Larsen, S.B., Nielsen, A.P., y Gosh, A. (2018). Combining or separating forward and reverse logistics. The International Journal of Logistics Management. Doi: 10.1108/IJLM12-2016-0299

- Honorato, M., 2016. *Logística Inversa - ¿Es Lo Que Tu Empresa Necesita?*. [online] Beetrack.com. Available at: <https://www.beetrack.com/es/blog/es-la-logistica-inversa-una-estrategia-adecuada-para-tu-empresa> [Accessed 6 April 2020].

- Jesús, L., 2013. *Logística Inversa En Los Procedimientos Empresariales*. [online] Gestiopolis.com. Available at: <https://www.gestiopolis.com/logistica-inversa-en-los-procedimientos-empresariales/> [Accessed 20 March 2020].

- Kopicky R. J., Berg M.J., Legg L., Dasappa V., y Maggioni C. (1993). Reuse and recycling. Illinois: Council of Logistics Management

- Movertis.com. 2019. *Los 7 Objetivos De La Logística Inversa*. [online] Available at: <https://www.movertis.com/blog/logistica/objetivos-logistica-inversa> [Accessed 10 March 2020].

- Mbegranollers.es. 2020. *MBE Granollers - Una Experiencia De Logística Ecommerce Única*. [online] Available at: <https://www.mbegranollers.es/servicio-logistica-ecommerce/?gclid=EAIaIQobChMIsI3e-IvZ5wIVClPTCh0mewzeEAAYASAAEgKn_fD_BwE> [Accessed 22 April 2020].

- Mbegranollers.es. 2020. *MBE Granollers - Una Experiencia De Logística Ecommerce Única*. [online] Available at: <https://www.mbegranollers.es/servicio-logistica-ecommerce/?gclid=EAIaIQobChMI9uGjwtuc6QIVhbLVCh3akA32EAAYAyAAEgK3gPD_BwE> [Accessed 22 April 2020].

- Pishvaee, M.S. y Torabi, S.A. (2010). A possibilistic programming approach for closed-loop supply chain network design under uncertainty. Fuzzy Sets and Systems, 161 (20), 2668-2683. Doi: 10.1016/j.fss.2010.04.010

- Rentero, A., 2018. *La Logística Inversa: ¿Qué Es Y Para Qué Sirve? - Blog De Hiberus Tecnología*. [online] Blog de Hiberus Tecnología. Available at: <https://www.hiberus.com/crecemos-contigo/la-logistica-inversa-que-es-y-para-que-sirve/> [Accessed 22 March 2020].

- Rogers D.S. y Tibben-Lembke R.S. (1999). Going backwards: reverse logistics trends and practices. Pittsburg: Reverse Logistics Executive Council

- Rogers D. S. y Tibben-Lembke R.S. (2001). An examination of reverse logistics practices. Journal of Business Logistics, Vol.2, Nº2. Doi: 10.1002/j.2158-1592. 2001.tb00007.x

- Rubio, S., 2003. *El Sistema De Logística Inversa En La Empresa: Análisis Y Aplicaciones*. [online] ResearchGate. Available at:

<https://www.researchgate.net/publication/39379153_El_sistema_de_logistica_inversa_en_la_empresa_Analisis_y_aplicaciones> [Accessed 22 May 2020].

- Rubio, S. and Jiménez-Parra, B., 2020. *Logística Inversa En Las Ciudades Del Futuro*. [online] Mincotur.gob.es. Available at: <https://www.mincotur.gob.es/Publicaciones/Publicacionesperiodicas/EconomiaIndustrial/RevistaEconomiaIndustrial/400/S%20RUBIO%20y%20B%20JIMENEZ.pdf> [Accessed 30 March 2020].

- Rogers D. S. y Tibben-Lembke R.S. (2001). An examination of reverse logistics practices. Journal of Business Logistics, Vol.2, Nº2. Doi: 10.1002/j.2158-1592. 2001.tb00007.x

- Royal Legislative Decree 1/2007, of 16 November, approving the revised text of the General Law for the Defence of Consumers and Users and other complementary laws. Boletín Oficial del Estado, Spain, 30 November 2007.

- Stock, J. R. (1992). Reverse Logistics. Illinois: Council of Logistics Management.

- Stock, J.R. (1998). Development and Implementation of Reverse Logistics Programs. Illinois: Council of Logistics Management.

- Stock, J. R. y Mulki J.P. (2009). Product returns processing: an examination of practices of manufacturers, wholesalers/distributors and retailers. Journal of Business Logistics, Vol. 30, Nº1. Doi: 10.1002/j.2158-1592. 2009.tb00098.x

- Wattanajantra, A., 2019. *Cómo Mejorar Las Cadenas De Suministro Y Lograr El Éxito Internacional (E-Book)* | *Sage Advice España*. [online] Sage Advice España. Available at: <https://www.sage.com/es-es/blog/mejorar-las-cadenas-suministro-y-lograr-exito-internacional/> [Accessed 22 May 2020].