



**Eco-innovation in Packaging for Waste
Prevention and Green Brand Image
(Multiple Case Study in the Food and
Drinks Industry)**

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Abstract

According to the United Nations' "3030 Agenda for Sustainable Development," there are seventeen important goals that must be met to achieve sustainable development globally. Between these goals, one crucial objective is to make the industrial production processes and consumption more sustainable. In this era of globalisation, packaging rises as a connection between all focus far and wide, permitting moving and commercializing items on a worldwide level, from makers to purchasers. Along these lines, it is important to know how the packaging industry is adjusting to the expanding requests of the business sectors while agreeing to the worldwide ecological prerequisites and maintainable objectives built up by global associations. Thus, packaging is an important component to be considered for the accomplishment of a sustainability aim that is clearly about minimising the environmental impact of packaging. This research expects to analyse the food and drink sector, aiming to see how the subject of eco-innovation and sustainability are looked at by food and drink manufacturers. The eco-innovation in packaging did not only address the waste management-related problems but also help solve many other environmental issues created by traditional packaging materials including plastic. Both internal and external elements of the company have an impact on the choice to introduce or embrace eco-packaging innovation. Numerous scholars stress the need of identifying the various drivers/motivations underlying the adoption of eco-innovations (in general). However, there is no research on what motivates innovation in eco-packaging. Eco-packaging is a part of circular economy practices for waste reduction and management. This research is aimed to explain the drivers and importance of eco-packaging for the circular economy objectives and waste prevention by food and drink companies. This study explores how different external driving factors help firms use their eco-capabilities and managerial environmental awareness as internal drivers to introduce eco-packaging innovation. This research also examines the role of packaging eco-innovation in the prevention of packaging waste. Moreover, eco-friendly packaging due to its environment-friendly design help to attain a green brand image. The study's findings will contribute to building a bridge in the research on the connections between eco-capabilities, eco-packaging innovation, waste reduction, and green image.

Keywords: Eco-packaging innovation, Eco-design for packaging, Eco-capabilities, Ecological modernisation, Managerial Environmental Awareness, Waste Prevention, Circular Economy, Green Marketing, Green Image.

Dedication

Special thanks go out to Allah Almighty, my sister, my parents, and my loving husband. Thank you, daughter Ayat, for your everlasting love and assistance which helped me achieve my objective. I want to thank my mother, father, brother, and sister, for their continuous love, unshakable support, and prayers, as well as the rest of my friends and relatives.

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Declaration

To state the following:

- The work that was turned in for this thesis is my responsibility.
- I am the author of this work.
- Every single quote has its own heading, and the sources are all clearly cited.
- The idea was published in a few articles and book chapters as this thesis was being written. The thesis' final sections are yet unpublished.
- This work was not submitted as a requirement for a graduate degree at this institution or other university.

Signature: Samina

Date: 10/05/2024

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List of Publications

Journal Article

Sumrin, S., Gupta, S., Asaad, Y., Wang, Y., Bhattacharya, S., and Foroudi, P. (2021). Eco-innovation for environment and waste prevention. *Journal of Business Research*, 122, pp. 627-639. <https://doi.org/10.1016/j.ibusres.2020.08.001>

Book Chapter

A chapter on *Establishing validity and reliability in case study research projects*, for The Routledge Companion to Marketing Research by Routledge, June 2021 edited by Len Tiu Wright, Luiz Moutinho, Merlin Stone, and Richard P. Bagozzi.

Chapter 1

INTRODUCTION

1.1 Industry Background

Packaging is an essential element of the product for protection during its whole lifecycle from production, storage, transport, marketing, sales, and usage (Singh and Sharma, 2011). It is also a means of creating consumer perception for a specific product and providing a specific position and image to that product (Ampuero and Vila, 2006). It also helps the producer to create a specific image of the product in the buyer's mind by providing the relevant information required by the consumers. Thus, the packaging is an essential marketing tool for the products (Silayoi and Speece, 2007).

Packaging is also becoming an excessive source of waste in the world. Packaging wastes has its effects on people, the planet, and the climate. The most popular goods with the highest packaging waste are foods and drinks. Each year, 207 million tonnes of packaging trash are generated worldwide (Ellen MacArthur Foundation EMF, 2013). As the world population is increasing, it is creating more need for food products and packaging on daily basis. According to the OECD report, around 3 billion people will be entering the markets as buyers by 2030 to buy products along with the packaging. These new buyers will consume more groceries and retail food, instead of spending on buying branded products. All this buying and consumption process will create more than 47% of packaging waste by 2025.

Packaging waste created by food products has become an interesting topic of debate. This packaging waste is also creating municipal solid waste (MSW). Therefore, packaging industry and producers should be more responsible for their packaging waste to solve these problems associated with packaging waste (Verghese et. al., 2012). that also required some action plan to be treated responsibly. The European Union (EU) has also introduced the circular economy system in 2015, in which recycling ambitions for the packaging waste materials have been determined for the producers to prevent waste.

The packaging industry is also following eco-innovation and sustainability practices. Packaging manufacturers are becoming more aware of the new renewable eco-packaging materials retrieved from the forests. These materials are better than plastic or glass in terms of carbon footprints (Johansson et. al., 2012). Forest Stewardship Council (FSC) is an organisation,

established in 1993 to manage the forests and their management ecologically responsible way. This organisation has a set of standards for the certification and labelling of responsible use of forests for packaging manufacturing by the companies.

The terms "eco-packaging" and "green packaging," as well as "eco-friendly packaging," are also used to describe this same practice. Eco-packaging not only fulfils the traditional functional requirements of packaging but also contains the characteristics of decreasing all types of negative environmental impacts to save the natural environment for the future (Lee and Choi, 2020).

Eco-packaging innovations in terms of paper and recyclable plastic packaging are a part of our future. Eco-packaging comes in a variety of forms that are considered as being environmentally beneficial. According to the EU Directive 94/62/EC, member states have a goal to recycle 65% by weight packaging and packaging waste themselves (European Union, 2018). Food packaging waste has different rates for recycling, as it is depending on the material used for the packaging. Some packaging materials are easily recyclable therefore, their recycling rates are low as compared to the others that are difficult to recycle as they need a complex recycling process.

Eco-packaging innovation is a solution to these recycling rates (additional costs). As the food and drinks industry is a big contributor to packaging waste, they need to introduce eco-packaging innovation as the last resort for packaging waste and solve the problems created by traditional plastic packaging. Many renewable materials used by packaging industry are manufactured from plants. These renewable packaging materials are safe for the natural ecosystem, animals, and plants. Therefore, renewable plant-based eco-packaging is helping packaging industry to move towards a circular economy with low carbon emissions. Use of polyethylene produced from sugarcane, as eco-packaging material is a very simple example of plant-based renewable packaging. Packaging industry is using different materials as eco-innovation in packaging. These materials are explained as follows:

1.1.1 Zero or No Packaging

There are many retail companies and supermarkets that are moving towards no packaging strategy as an eco-innovation option for their products. For example, fresh fruits, vegetables, nuts, meat, fish, eggs, etc. can be sold without any packaging. Consumers are bringing their reusable bags to retail shops or supermarkets to take away these food products.

1.1.2 Compostable Packaging

Cardboard is a very common compostable packaging material these days. We can find it in every food-related business. Composite packaging requires proper disposal by using necessary procedures. It can be a proper disposal place inside a factory or a home. If this composite packaging becomes a part of landfills, it will not dispose of itself. These compostable packaging are mostly made of bamboo, banana peel, potato, and corn starch.

TIPA is a very famous company to produce revolutionary compostable food packaging for many brands. TIPA packaging materials are sourced efficiently from bioresources. The compostable packaging made by TIPA can decompose within 180 days, with the presence of the right heat, moisture, and microbes. Anyone can fulfil these conditions for the proper disposal of compostable packaging within their bins at home. Simply, we can say that it is not dangerous for households to independently dispose of their compostable packaging waste without any cost.

1.1.3 Biodegradable Packaging

Biodegradable packaging is another type of eco-packaging that is safe and environmentally friendly. The new eco-friendly trends around the world are the most prominent reason for the introduction of biodegradable packaging for the food industry. It is developed to replace the traditional plastic packaging in the food industry as it satisfies all other necessary and functional requirements of plastic packaging including food safety, increase shelf life, and transportation along with the reduction of environmental impact.

Biodegradable packaging is made of polyose, cellulose, lipids, and proteins (bio compounds). These bio compounds can break down food and vegetative waste to use them as food biopolymers for biodegradable packaging (Gupta et.al., 2022). These bio compounds are natural sources of materials that are used to produce eco-packaging for food products. Biodegradable packaging also has water resistance ability. But these biodegradable packaging materials are not the best alternative for petroleum-based plastic packaging.

Ultraviolet (UV) rays are also used for the degradation process of these degradable packaging materials helping them to return to their natural environment without having any negative impact on humans or the environment. In France, plants are used as a degradable material for making boxes for packaging. After their usage, they can decompose easily without causing pollution or harm to any human or environment.

1.1.4 Edible Packaging

Edible packaging is an eco-packaging innovation in which edible materials are used as thin layer of spray or wrap (i.e., chitosan coating, plant extracts, maize, carrot film, tomato and apple base, banana, and potato starch) around the food. It is an active packaging in which nutrients, bioactive, and vitamins interact with the food. This interaction process releases antioxidants for the food to keep it safe from dangerous gases and moisture.

1.1.5 Recycled Material Packaging

Recycling is an important process to decrease packaging waste as food and drink packaging waste can be recycled and turned into eco-packaging by reusing the material. The eco-packaging innovations have characteristics to be recycled and reused. Many eco-materials including paper packaging, aluminium, recycled plastic, glass, cardboard, and composite packaging can be recycled. These recycled materials are helping companies in waste prevention and improving their greener image.

1.1.6 Packaging Made from Renewable Sources

Renewable means the ability to re-grow or renew. Wood, potatoes, Coconut, banana, and sugarcane are very simple examples of renewable resources that can be used as packaging material. Polymers are very commonly used eco-packaging innovation materials. The advantage of using polymers as packaging materials is that they can be biodegradable or compostable based on environmental circumstances.

1.1.7 Reusable and Recyclable eco-packaging materials

Almost all eco-packaging innovations have reusability and recyclability features (circular economy). Reusable packaging means it is refillable or can be renewed to reuse it for any other purpose. For example, jars and glass bottles can be reused by the household for any other purpose inside the home. There are many schemes introduced by different countries around the world to collect reusable packaging. Some of them are a curb side collection of household waste, a take-back scheme, and a deposit refund system (DRS). The introduction of reusable carrier bags is also a part of the reusable scheme where there is a ban imposed on single-used thin plastic-made carrier bags. New reusable bags are introduced to replace these traditional plastic bags to be used multiple times by consumers.

Recycling is another feature of eco-packaging innovation and a solution for waste prevention. It is normally done at the last stage when packaging is considered as waste by households. The recycling process has four stages primary stage, secondary stage, tertiary stage, and quaternary stage. Primary stage recycling is a type of close loop recycling in which the same type of plastic packaging waste (same properties) is recycled.

In the secondary stage, plastic waste processed in the primary stage is converted into any other product by using a mechanical process. In the third stage, the tertiary recycling process is used to retrieve fossil fuel and compounds from plastic packaging waste. Waste that can be recycled for the production system will be utilized to recover energy in the quaternary stage. Recycling is a way to prevent waste and generate employment opportunities by developing recycling plants for packaging waste.

OVERVIEW OF POLICIES AND REGULATION RELATED TO PACKAGING

This section will highlight different regulations set by EU and UK local government to tackle packaging waste by introduction of eco-friendly packaging materials with reusability, recycling, and renewal features.

EUROPEAN UNION (EU) REGULATION FOR PACKAGING WASTE

There are several policies introduced by EU for the environmental protection and packaging waste management by the producers. In these regulations there are different recycling targets are defined for the EU countries for their packaging waste (European Commission, 2018). Waste Framework Directive 2018/851 set reusability and recycling targets of municipal waste as 55% in 2025, 60% in 2030 and 65% in 2035 (European Commission, 2018). Municipal waste consists of a huge part of packaging waste therefore, to achieve these set targets by EU packaging recycling, reusability and alternative material usage for packaging has become an important part of this initiative (Faraca and Astrup, 2019; Grégoire and Chauvelot, 2019; Czarnecka-Komorowska and Wiszumirska, 2020).

European Commission Directive 2018/852 highlight different types of packaging waste including paper, plastic and glass that is a big part of household waste. Reforms to reuse, recycle and introduction of new alternative materials of these packaging are an essential part of EU waste management policies (European Commission, 2018). Based on European Commission waste management policies packaging waste a target has been set by EU for its recycling, Minimum 65% packaging waste should be recycled up to 2025 and it should be increased by 5%, from 65% to 70% in 2030 (European Commission, 2018). In 2018 a very first policy was introduced to use alternative packaging materials instead of plastic and improvement in plastic to increase its recyclability and reusability along with decrease in packaging waste (European Commission, 2018).

These EU waste regulations and set targets (European Commission, 2018) were difficult to achieve therefore “*A new Circular Economy Action Plan for a cleaner and more competitive Europe*” was proposed with some set targets for packaging waste in the coming years

(European Commission 2020). Transformation of tradition plastic and other non-recyclable materials was an essential part of this plan. It also emphasis on the sustainability of production process and change in the consumption pattern. It focuses on the plans for plastic and packaging companies to move towards circular economy. The packaging manufacturers were given an important responsibility to design plastic packaging based on circular economy objectives and introduction of reusability features by changing consumer behaviour. It also proposed reforms for less waste during production process and after consumption of food products (European Commission 2020).

NATION LEVEL (UK) REGULATIONS FOR PACKAGING WASTE

There are different circular economy (CE) strategies are introduced by the UK government as a roadmap towards sustainability and fulfil recycling and waste management targets. This segment of the thesis will explain different environmental policies, incentives, support, taxes, schemes, and strategies introduced in the UK related to packaging waste management. These environmental policies are affecting the food and drink companies through different ways. Therefore, these companies are working on their waste management strategies to be prepared for the changes to be implemented by government for waste reduction in terms of circular economy instruments.

According to Revell and Blackburn, (2007) in UK most of the environmental policies introduced by government are regulatory, fiscal (taxes and fees), or voluntary (ISO14001). Most of the time UK government depend upon voluntary actions and strategies by producers for waste management in return of social, economic, and environmental benefits. The UK government is only encouraging producers and businesses to understand the importance of environmental responsibility and introduce ecological plans, activities, and innovations within different industries. Environmental Protection Act 1990 was the one of the very first environmental policy by UK government for manufacturing companies to control their production pollution.

These days UK government is issuing licences for the manufacturing activities. Different industries inside the UK must maintain certain standards set by the UK government to get these licences. For example, businesses need to invest in waste management and extended producer responsibility policies to achieve constitutional requirements set inside the country (Chapple et al. 2001). The UK government is continuously working on environmental policies, targets for waste reduction, and procedures for producers to follow if they want to stay in the industry so the companies are forced to introduced solutions for their manufacturing and packaging waste to stay competitive in the market (Zutshi and Sohal, 2005). The manufacturing companies in

the UK are responsible to accept UK government policies and laws to reduce their waste and decrease the environmental impact of their manufacturing process (Ormazabal et al 2015).

In UK there are different regulations for the proper disposal of electronic goods. The regulation named as Waste Electrical and Electronic Equipment (WEEE) were introduced in 2014 to solve the problems related with the electronic equipment's becoming a part of landfills. The Carbon Reduction Commitment (CRC) is working with the electronic industry to organise reports for their waste (SEPA 2017). These legislations are shifting voluntary schemes burden to the penalty, taxes, fees, and discounts depending on the business environmental performance.

According to several academic research, these governmental policies and laws have a significant role in encouraging the adoption of eco-innovation (Horbach et al. 2012; Doran and Ryan, 2012; Fernando et al 2016; Dakup, 2018). The information and implications of these policies within industries are based on their waste and standard set for the industry. For some businesses anticipation of strict environmental laws and instrumental policies are enough to encourage innovation in their processes (Khanna et. al. 2009). Following are the few policies and strategies designed by UK government for the producers to make them responsible for their manufacturing and packaging waste.

- *5p Bag Charge*

According to DEFRA report published in 2010, only supermarkets inside the UK created 7.57 billion wastes in the economy in terms of virgin plastic (WRAP, 2013). This plastic packaging waste can be seen as garbage at the public places. This litter in form of traditional non-recyclable plastic is damaging human health, environment, marine life, and polluting water (DEFRA, 2013). To preserve our planet for future generations and environments, these issues must be fixed.

One of the packaging waste related legislations announced and passed in the parliament in October 2014. This legislation put responsibility on all supermarkets, retailers, and sellers to charge “5 pence” for their plastic (non-recyclable) carrier bag. This legislation is accepted by every food and non-food seller within the UK. The new reusable long-life carrier bags are introduced by many brands, supermarkets, and retailers with some charges so that buyers can reuse them for long-time. Some of these bags are replaceable at the shop by the manufacturers in case they worn out with the passage of time. The main objective for the introduction of these types of bags is to reuse them as this will resultantly decrease the amount of plastic waste.

- *Environmental Management Systems*

Environmental Management Systems (EMSs) is voluntary action taken by the firms to reduce environmental impact. According to Wagner, (2008) The adoption of eco-innovation might be aided through Environmental Management Systems (EMSs). A business can utilise a variety of environmental management technologies to enhance its environmental performance. Some of these tools are reviewed in the following table.

Table 1.1 Different Tools used by the companies for better environmental performance.

Strategies	Tools
Environmental Regulations	Environmental Policy within the company
Environmental Education	Appointment of Environmental managers and other professionals and environmental impact studies
Environmental Performance Assessments	Compliance assessments and Introduced Environmental Management system audit
Environmental Key Performance Indicators	Less production process emissions, Less water waste, Less emissions, and less use of energy resources
Packaging waste prevention	Eco-design for packaging, reduce packaging volume, Reusability of packaging, Recycling packaging waste, recover resources from waste
Environmental management systems	According to the guidelines established by ISO 14001, the EU Eco-Management and Audit Scheme (EMAS), and the British Standard for the progressive development of an Environmental Management Systems
Source: Author Generated	

- **ISO**

The United Nations Standards Coordination Committee (UNSCC) and the International Federation of the National Standardizing Association (IFNSA) were combined to form the International Standards Organization (ISO), which was founded in 1947 by 25 nations to control industrial firms via the adoption of technical standards (Dakup, 2018). According to (Potoski and Prakash, 2005; p. 83). International Standards Organization is working to “*facilitate international trade and commerce by developing common international standards for products, materials, and processes*”. The very first series of regulations were introduced as “ISO 9000” in 1980’s to evaluate different companies’ management systems.

The first series for environmental regulations were introduced in 1996 as “ISO14000” to evaluate different companies’ environmental management systems (EMS) (Potoski and Prakash, 2005). There are six groups and 21 guidelines for the environmental management of the production companies. The certification of ISO is an important document for the companies to run their business around the world. To measure the environmental effect and usage of natural

resources throughout industrial processes, ISO developed life-cycle assessment techniques (ISO 14040, 2006).

The ISO established six standards and a new set of guidelines (ISO 18601, ISO 18602, ISO 18603, ISO 18604, ISO 18605) in 2013 to lessen the environmental effect of packaging waste. These rules are directly related to domestic, commercial and trade packaging. These guidelines help manufacturing companies to understand the importance of environmental packaging and innovate current packaging from environmental perception. To accomplish these ISO requirements manufacturing companies does not required any third-party certification for their packaging. Thus, these ISO standards help companies to achieve sustainability standards for their packaging. ISO 18601 is related with the packaging material quantity or volume, ISO 18602 is to review the substances used in the materials for packaging and whether these materials are easily separatable, collectable, and recyclable or not? So, these ISO regulations can help companies for eco-packaging innovation introduction process (Bjørn et. al., 2018).

- Eco-Management and Audit Scheme (EMAS)

EMAS is circular economy instrument that help to measure the circular economy practices existence within a company for better environmental performance (Dorado et al., 2022). EMAS address some environmental issues that are not considered in ISO standards. These issues are related to sustainable development, environmental protection, and indicators to measure it (Dzakhmishева et. al., 2022). EMAS require companies to focus on new technology and their environmental policy for good environmental performance for the stakeholders and better financial performance for the company (Merli et. al., 2018). The following criteria are set for the companies who implement EMAS scheme:

- Environmental assessment: It includes a complete evaluation of the company's Production activities and the impact of these activities on environment.
- Environmental program to set eco-friendly targets and objectives for the company
- A comprehensive environmental management system with proper planning for company's activities.
- Environmental performance annual review
- Environmental performance and emissions reports
- BS8555

BS8555 was created in Britain by The Acorn Trust and now it is controlled through Institute of Environmental Management & Assessment (IEMA). BS8555 are the EMS implementation according to the British Standards. It helps companies to add environmental concern in their

strategies, daily activities, and production performance through six simple stages (WRAP, 2015). The six stages are:

1. Pledge and founding the criterion for EMS.
2. Associating and guaranteeing conformity by accomplishing official obligations
3. Creating aims, objectives, and systematic approach to implement EMS.
4. Application and functioning EMS
5. Examining, reviewing, and re-evaluating environmental performance
6. EMS recognition through ISO 14001 and/or EMAS.

The explanations and thorough analysis of EMS provided above make it clear that it may assist businesses in implementing environmental standards. This research considers how environmental rules might act as external motivators for UK food and beverage industries to embrace eco-packaging innovations.

1.2 Synopsis of Related Literature

According to the United Nation Environment Programme (UNEP, 2018) 50% of the packaging waste is in form of plastic around the world. Almost 40% demand of plastic as packaging material is demanded by food and drink companies (Plastics Europe. 2017). According to Mays et. al., (2020) only in Europe almost 26% packaging waste was accumulated in form of virgin plastic as only 30% plastic packaging waste was recyclable.

Due to the impact of plastic pollution on eco-system it is very important to understand the ways to reduce plastic from packaging. There are three ways of packaging waste disposal recycling, incarnation, and landfill and plastic is the only packaging material that is becoming a part of landfill due to its long decomposition and complicated recycling process (Plastics Europe. 2017). According to Koenig-Lewis et al. (2014), most of the environmental problems are arising due to the use of non-environment friendly materials in the packaging. The main reason behind this is lack of knowledge and understanding regarding possible alternatives of plastic. It is also keeping food and drink production companies lacking behind their sustainability initiative.

United Nation in its report names as *Brundtland Report* introduced the term *sustainability* and after that this term has been used in research, reports, policies made by the countries and different organisations working for environment. Sonneveld et. al. (2005) was the very first person who discussed packaging sustainability in his study. With the evolution in the environmental research sustainability has become an essential part of packaging sector and related studies.

According to Worm et. al., (2017) sustainability in terms of packaging is a very challenging initiative as it is linked with plastic packaging that is a big part of the production companies from many years and along with that plastic is a source of marine litter, air pollution and water pollution. Therefore, plastic pollution has gained researchers attention and created awareness for environmental protection (Ma, Aranda-Jan and Moultrie, 2019). Different countries introduced their laws for plastic elimination and introduction of eco-friendly packaging for waste elimination.

According to (Das and Prasad, 2014; Raynaud, 2014) more than 60 countries around the world has introduced different waste management laws to decrease the use of single used plastic from the products packaging. In 2019, Department of Business, Energy and Industrial Strategy UK and Food and rural affairs Department demand research institutions, and packaging manufacturers to provide evidence for biodegradable packaging materials as they claim that it has less environmental impact and are the best alternative for plastic packaging. Different academic institutions and packaging companies are also working to understand how they can eliminate plastic and introduce eco-friendly packaging to fulfil market demand and government legislations.

Uniter Nation along with Ellen MacArthur Foundation has also introduced *New Plastics Economy Global Commitment* that is signed by different fast-moving consumer good (FMCG) companies, packaging manufacturing companies, and different countries governments to eliminate pollution and waste created by plastic packaging (Calleja, 2019). With the passage of time consumers are also getting awareness for eco-friendly packaging and problems raised from plastic packaging waste because of research and new social media content available to them (Prata et. al. 2019). Therefore, consumers are keeping packaging sustainability into their mind while buying anything from the market (Magnier and Schoormans, 2015). As a result, companies are researching to find solution for the elimination of plastic packaging.

In 2016 *Ellen MacArthur Foundation* published a report named as '*Rethinking the future of plastics*' that analyse different industries, identified the one who urgently needs action to eliminate packaging and provide reasons for the urgency within those sectors (Ellen MacArthur Foundation, 2016). Elimination of plastic packaging from food and drink production companies and fast-moving consumer good companies was a very prominent part of that report. If countries want to move towards zero-plastic, food and drink companies seriously needs to think about changing their packaging. these companies can reduce their plastic waste by using

recycled materials, decreasing, or redesigning their packaging and introducing eco-friendly packaging materials.

According to Meherishi et. al., (2019) research on packaging for its sustainability are not well connected with each other. Similarly, packaging is not clearly explained as a way towards sustainability. Different studies are available on sustainable packaging, regulation for waste management, consumers buying behaviour for eco-friendly packaging, and pollution created by traditional plastic packaging, but still there are some barriers attached with the implementation of new packaging technologies, new eco-friendly materials, lack of consumers interest, and vague public policies that are making it difficult for companies to smoothly adopt new packaging.

Different researchers introduced tools for the companies that they can use to calculate the costs they can decrease with the use of eco-friendly packaging and instead of waste landfill they can recycle their packaging to reuse it (Singh and Cooper, 2017; Joseph et. al., 2019 and Resat and Unsal, 2019). Studies on the sustainable packaging also develop frameworks for the companies to use their supply chain for decrease in the environmental impact of their packaging (Geissdoerfer et. al., 2018). But existed research focused on cost related benefits of different packaging materials by comparing them with economic benefits. So, these studies also did not directly focus on plastic elimination for waste prevention. The main question arises here that why different drivers and internal capabilities of the firms are not discussed here that can encourage companies to reduce plastic packaging and adopt eco-friendly packaging to prevent waste?

Recycling waste is also discussed as an option for the companies to reduce plastic waste. Milios et. al., (2018) in his study on plastic waste conclude that due to the less costly virgin plastic and design element of other packaging materials leads to the less recycling of plastic waste. Another reason for not recycling plastic waste is that 80% of plastic packaging waste is contaminated as it has higher density of polypropylene (PP). Additionally, most of the existed research on plastic waste are focusing on consumer, government, and stakeholders as main drivers for the elimination of plastic packaging without considering any specific company in the study (Hopewel et. al., 2009; Mwanza and Mbohwa, 2017; Ragossnig and Schneider, 2017).

These questionable things are also confirmed in the literature review chapter that companies are not an essential part of plastic reduction, eco-friendly packaging and waste prevention studies, there is also lack of understanding and knowledge for food and drink companies for the waste prevention by adopting waste reducing eco-friendly packaging. This research will try to

facilitate food and drink companies by explain them the experience of companies who adopted eco-friendly packaging for waste prevention.

1.3 Research Background

Eco-innovation is characterised as a modification to a good, method, manufacture, or consumption that aids any company in achieving compatibility and sustainability (Carrillo-Hermosilla, et. al., 2010; Machiba, 2010; Bönnte & Dienes, 2013; Zubeltzu-Jaka et. al., 2018). Adams et al. (2012) claim that for governments to encourage manufacturers to use eco-packaging innovation, they must first recognise the advantages of eco-innovation. In the literature, this environmental innovation in package design is also referred to as green innovation, eco-design packaging, and eco-friendly packaging innovation. Some other studies used sustainable packaging terms for the same phenomenon.

In the last few years, eco-innovation has become an essential topic of research for the environmental benefits attached to its adoption. Consumers are also understanding that eco-packaging innovation can benefit humans, businesses, the environment, and future generations. Because of the customers' environmental awareness and demand for eco-packaging innovation many companies are working on eco-design for packaging with the help of innovative technology. They have introduced different recyclable and reusable materials that fulfil environmental requirements.

Packaging-related waste management laws are also getting attention globally. The very first person who introduced the eco-packaging design sign on the packaging was introduced by Der Grüne Punkt (from Germany) in 1975. Later, an environmental control organisation (ISO) and environment-related packaging standards were announced in 1993. After three years in 1996, these standards were implemented by different countries (Adams et. al., 2012).

The terms biodegradable packaging, eco-design, green packaging, and eco-friendly packaging refer to several research on the topic of eco-packaging innovation. But there is no literature available on eco-packaging innovation that can independently and comprehensively explain the eco-packaging innovation, driving factors of eco-packaging innovation, and the adoption process of eco-packaging innovation to support waste prevention.

There are studies to determine the drivers of eco-innovation (product, process, marketing, management) and create awareness among businesses of the benefits of eco-innovation in form of sustainability and competitive advantage (Horbach et. al., 2012; De Medeiros et. al., 2014; Díaz-García et. al., 2015 and Del-Río et. al., 2016). These studies are helping producers to understand the importance of eco-innovation for business benefits. For their theoretical

underpinnings, these works primarily draw on the resource-based approach and stakeholders' theory (Del-Río et. al., 2016).

Only a few aspects, such as the influence of environmental management strategy on eco-innovation, have received much attention in the study on the factors influencing eco-innovation (Rennings et. al., 2006; Rehfeld et. al., 2007), internal research and development, and firms' capabilities (Rennings et. al., 2004; Kammerer, 2009; Triguero et. al., 2013), firms equipment's revitalisation (Demirel & Kesidou, 2011), co-operation among working teams (Mazzanti & Zoboli, 2009), managers related driving factors (Fronzel et. al., 2004 and Triguero et. al., 2013). The internal resources and capabilities like needed learning, skills, and procedures are essential for a company to develop or introduce eco-innovation (Christmann, 2000; Darnall, 2006; Doran & Ryan, 2016).

External drivers force a firm to develop needed internal capabilities to fulfil the demand of regularity authorities, customers, and stakeholders but these capabilities must be sustainability-oriented so that they can meet the environmental needs of the economy (Derimal and Kesidou, 2018). Different studies used different perspectives to explain antecedents of eco-innovation (Cai and Zhou, 2014) including the stakeholders' theory (Guoyou et. al., 2013), institutional theory (Cai and Li, 2018; Chen et. al., 2018), and the resource-based view (Xavier et. al., 2017).

There are several more studies based on eco-innovation, including external motivations for the development of eco-innovation (Inoue et. al., 2013; Bossle et. al., 2016), how the use of renewable energy and other ethical factor affect the decision-making process of eco-innovation (Marousek, 2013), the variable influencing the green supplier selection process (Govindan et. al., 2015) voluntary efforts by a company for environmental management (Li et. al., 2019).

Some other studies are based on the quality management and eco-innovation relationship (Talib et. al., 2011), environmental management system, and eco-innovation (Demirel and Kesidou, 2011). According to Arranz et al. (2019), who employed the dynamic capabilities method, eco-innovation is dependent on a firm's internal dynamic capabilities. He also outlines the variables that influence or motivate a company's goals for various forms of eco-innovation. But still, the literature on eco-packaging innovations that are linking it with waste prevention and brand image. Zhu et. al., (2022) in their study on circular economy and packaging design conclude that eco-packaging innovation is necessary right now, thus ongoing research into the factors that influence a company's decision to embrace it is necessary.

By examining the process of adopting eco-packaging innovation for waste minimisation and brand image, this research seeks to add to the body of knowledge on the topic. The circular

economy model and ecological modernization theory serve as the theoretical foundation for the research framework in this study, which aims to understand the many factors that influence the adoption of eco-packaging innovations and their advantages in terms of waste prevention and a "green image". The data will be collected by food and drink companies to understand the eco-packaging innovation awareness and adoption by these companies.

1.4 Research Gaps

It is a well-known fact that plastic is a very common material for food and drink packaging. Many studies also clearly state that small changes in the packaging materials are not enough to cope with environmental problems occurring from food and drink packaging waste. A big change in the food and drink packaging and their treatment is necessary to ensure waste prevention and environmental sustainability. Changing packaging materials and reducing the use of plastic in the packaging is an important decision that needs to be taken by the cooperation of employees and company stakeholders. Companies are not considering big changes in their product packaging.

Studies are available addressing technological difficulties, technological and human capabilities, consumer, or regulatory pressure for the change in food and drink packaging materials. Different researchers work on the identification of factors that can drive eco-innovation. Consumers are very important drivers for encouraging companies to adopt eco-friendly (sustainable, environment-friendly, or green) packaging (Moser 2015; Prakash and Pathak 2017; Chaihanchai and Anantachart 2023; Yao et. al., 2022).

The other driving factors include institutional pressure by the government through legislation (Kesidou & Demirel, 2011; Berrone et. al., 2013; Bossle et. al., 2016; Kunapatarawong & Martínez-Ros, 2016), strategic drivers including costs reduction and brand image (Demirel and Kesidou, 2011), Customer's demand (Kesidou and Demirel, 2011), manager intension and behaviour (Cordano and Frieze, 2000 and Chou et. al., 2012) and market competition (Rehfeld, et. al., 2007; Horbach, 2008; Lin, et. al. 2013 and Jové-Llopis & Segarra-Blasco, 2018).

It is still very difficult to find a study that discuss the driving factors for the food packaging companies that reduce their waste by introducing eco-packaging. As there is very limited research on the companies understanding the problems created by packaging waste and successfully changing their packaging. Study on these companies can help others that needs come relevant data and information to change their packaging.

If a study addresses their concerns in form of questions from the companies successfully using eco-friendly packaging, it will help and motivate many others to change packaging to reduce

not only their own waste but also waste in the community. So, this study is conducted to understand the status of eco-friendly packaging in food and drink manufacturing sector and to explore the unique relationship between the eco-innovation in packaging and waste prevention. The following two gaps are discovered in the literature:

Gap 1. There is a lack of understanding of main external and internal drivers for the adoption of eco-packaging the food and drink companies.

Gap 2. A very few studies are available for the food and drink companies to understand the importance of eco-friendly packaging to reduce packaging waste.

This research will help to understand how food and drink companies are responding through their strategic decisions to different drivers or external drivers of eco-innovation in terms of eco-packaging adoption? Addressing the environmental packaging demands needs managers' action/response on it but there is less importance given to the role of the manager in the literature for strategic decisions regarding eco-packaging innovation by the firms. Even though, he plays a significant role in the decision-making process for the company's environmental policy on various environmental issues. Therefore, managerial concern is considered as an important driver for the adoption of eco-packaging. Zhang et. al., (2013) in their work shows that social pressure on a firm for environmental strategy is an important driver for the manager that drives him and the firm to work on environmental strategy and the use of cleaner production process.

Adoption of any new type of eco-packaging is a part of changing process within a company. Through which a company transform its plastic packaging to completely new eco-friendly packaging for reduction in packaging waste. Thus, this research has main research question that revolves around changing traditional plastic packaging to eco-packaging and its impact on the food and drink companies. The main research question is: What are the main driving factors that help food and drink companies new eco-packaging that help them to switch from plastic packaging to the zero percent plastic with reduction in waste?

The main research aim is achieved by formulating 4 sub-questions. First, I need to understand the main drivers that are facilitating or motivating the food and drink companies to not use plastic and move towards less use of plastic based eco-packaging. To get the answer first research question is formed as:

1. What are the most prevalent driving factors that are urging food and drink companies to adopt eco-packaging.

Every company has different teams and departments for strategic planning or to reform strategies for company's survival in the market. There are different people working in each

team or department to decide or give their opinion on a specific issue. It is very important to understand the importance of managerial knowledge and concern in food and drink sector for the decision making relevant to switching from plastic to eco-packaging. This quest leads to the next research question:

2. In what way does managerial environmental concern link with the adoption of eco-packaging innovation by the food and drink companies?

After getting knowledge on the external drivers through first research question, I must understand the internal driving factors/resources important to facilitate the switching process. In simple words I gain knowledge on internal system/process changes incorporated within the company to incorporate changes in their food and drink packaging. This leads to the thord research question:

3. Which type of eco-capabilities are required for the adoption of eco-packaging innovation by the food and drink companies?

I also must understand the practical impact of eco-packaging adoption by the food and drink companies. It will help to generate new information in the field of packaging waste prevention. The following research question is formed towards the path to form relationship between eco-packaging and waste prevention.

4. What are the consequences or results of eco-packaging adoption in terms of prevention of packaging waste?

All above mentioned research questions will help to form a good piece of information on different external and internal drivers of eco-packaging to achieve waste prevention by food and drink companies.

Eco-innovation in packaging and waste reduction has become an essential topic of discussion among academic researcher, public organisations, manufacturing firms and environmental organisations. Today social media is also contributing and increasing awareness among consumers sustainability related concepts including sustainability, environmental responsibility of the production companies, Thus, consumers is considering environmental aspects while buying anything (Nielsen, 2014). Consumers are very conscious about packaging recyclability, reusability, and proper way to discard their packaging waste. According to Nordin & Selke, (2010) consumers are fully aware regarding food packaging waste and environmental concepts related to the packaging such as air pollution, renewable natural resources.

Packaging is one of the important marketing mixes that help food companies to get more market share, gain new customers and loyalty among existing customers. In food marketing, sustainable food packaging is an important topic of research now a days. Researchers are investigating environmental packaging and sustainable packaging to study consumer behaviour and knowledge related to the packaging related environmental issues (Koenig-Lewis et al., 2014; Magnier & Schoormans, 2015; Lindh, Olsson & Williams, 2016). Previous studies focused on consumer behaviour and their acceptability for sustainable and eco-packaging. However, very few studies discussed drivers of eco-packaging specifically approved by producers. It shows that there is a need of specific study that explain the most important driving factors for the adoption of eco-packaging by food companies and its impact on the packaging waste as compared to the use of traditional packaging materials.

- To evaluate the content of prior studies different driving factors of eco-packaging innovation in the context of packaging waste prevention.
- To investigate managerial environmental concern as main driving factors of eco-packaging for packaging waste prevention in the UK.
- To understand how firm's eco-capabilities contributes to the adoption of eco-packaging for waste prevention by food and drink companies in the UK.
- To evaluate the impact of eco-packaging in terms of waste prevention specifically for food and drink companies in the UK.

1.5 Research Questions

What are the main driving factors that encourage food and drink companies to adopt eco-packaging for the prevention of packaging waste?

And four research sub-questions are proposed.

1. What are the most prevalent driving factors that are urging food and drink companies to adopt eco-packaging.
2. In what way does managerial environmental concern link with the adoption of eco-packaging innovation by the food and drink companies?
3. Which type of eco-capabilities are required for the adoption of eco-packaging innovation by the food and drink companies?
4. What are the consequences or results of eco-packaging adoption in terms of prevention of packaging waste?

1.6 Research Methodology

To further understanding of eco-innovation utilising the circular economy model and the ecological modernization theory, this study employs qualitative methodologies and a case study approach. A qualitative research approach is very suitable for studies where we need to understand a phenomenon or a unique event (Meriam, 1998). This research begins with the study of extensive literature available on different types of eco-innovations to use this data for theoretical positioning and research framework formation (Eisenhardt and Graebner, 2007; Yin, 2014). The selection of these firms is based on a selective and snowball sampling strategy, and the study design is based on several (four) case studies.

The number of cases choice was made, following the guideline of Eisenhardt, (1989, p. 545). She asserts that while there is no set restriction on the number of cases that can be used in case study research, the optimum strategy up to this point has been to choose between four and ten. Like this, Perry (1998) recommended a minimum of two to four examples for research into case studies. The researcher tested the validity of the information and the data gathering procedure using a case study approach. Multiple types of data mean i.e., interviews, already available researchers, observations, and documents are used for reliability and data triangulation (Yin, 2014).

Interview data were first transcribed by using NVivo software and subsequently coded. The data was organised and coded in the NVivo 12 software. The data was read line by line by the researcher to assign parent codes and child codes to it for thematic analysis. Data were analysed using thematic analysis, which is often referred to as qualitative content analysis. Phases of the data analysis were carried out: first, a with-in-case study, then a cross-case analysis.

For within case analysis researcher used case descriptions by following theoretical positioning. For cross-case analysis matrix coding query and text query in NVivo 12 were used to predict the patterns and go back and forth. After with-in-case and cross-case analysis, based on the results and findings propositions were validated, revised and new emerging propositions were proposed. A new revised model is also developed by using main themes and second-order themes. the researcher also followed the ethical guideline provided by Newcastle University. For confidentiality interviewees' names are kept anonymous.

1.7 The Contributions to Knowledge

This research intends to make numerous contributions to the literature on eco-packaging innovation and managerial decisions for the adoption of eco-packaging for the benefit of the company. The main addition of this study is that by embracing both ecological modernisation

and circular economy viewpoint, it expands the literature on the drivers of eco-packaging innovation. Managers should understand the importance of eco-packaging as management commitment toward firms' environmental issues can help in the adaptation and introduction of innovation that can improve firm performance (Pipatprapa et. al., 2017).

This study will also contribute to the academic literature by examining management environmental awareness and company eco-capabilities for eco-packaging innovation and impact of eco-packaging in terms of waste management. These are two mostly unexplored but crucial areas of eco-innovation research, this study will also add to the academic literature on eco-packaging innovation and waste management. By giving the answers to *What, How, why,* and *when* this study will help and encourage managers to understand the process to easily adopt eco-packaging innovation in their firm. Secondly, this study will be examining the impact of eco-packaging innovation in terms of waste prevention, green marketing, and green image.

It will be the first type of study to look at how managers concern for the environment and internal eco-capabilities aid in the introduction of packaging eco-innovation because the studies on eco-innovation that are now available are primarily based on product eco-innovation or process eco-innovation. By demonstrating the significance of two key driver's managerial environment concern and businesses' internal capabilities this study will also assist package manufacturing organisations in understanding the significance of research and development training, use of environmentally friendly technology, and eco-innovation in packaging for obtaining brand advantages in terms of waste prevention, green marketing, and green image.

This research contributes to the knowledge by extending the knowledge on waste prevention by eliminating plastic packaging and adopting eco-friendly packaging. Research adopts the approach of engaging stakeholders. Collaboration with other organisations, managerial environmental concern, and eco-capabilities to construct a qualitative research context.

By getting significant from the people working within the industry a reasonable amount of empirical data is now available based on the interviews and observations that provide deep insight into different driving forces and changes coming into the sector after reduction in plastic packaging by adopting eco-friendly materials. Additionally, this study supports the link between waste reduction and food and drink firms' use of eco-packaging. The core contribution of the study can be explained as:

1. A specific set of external driving factors for food and drink sector are identified for the exclusion of plastic as packaging material and adoption of eco-packaging.

2. Managerial environmental concern was identified as an important enabler of plastic packaging prevention for the companies.
3. Eco-capabilities were identified to that positively impact the process of eco-packaging adoption within the company. these capabilities are divided into three categories: human, technological capabilities, and research and development capabilities.
4. These three major drivers external, managerial environmental concern and eco-capabilities form a framework that explain the reduction in waste can be achieved by the adoption of eco-friendly packaging.
5. This study also explain that the adoption of eco-friendly packaging is a transformation management, in which companies open their boundaries for collaboration and create new kind of dependent relationship between brands, stakeholders, and research institutes.

CHAPTER 2

LITERATURE REVIEW AND RESEARCH FRAMEWORK

2.0 Introduction

This chapter aims to discover the related research available on eco-innovation in packaging. This chapter begins with the introduction of eco-packaging, concepts, and themes used in the existed research regarding eco-packaging innovation, and then introduces different drivers for eco-packaging adoption within a food and drink company, and its impact on the company.

Eco-packaging is also named environmental packaging, green packaging, sustainable packaging, and eco-friendly packaging that not only fulfils the basic needs of packaging by providing all traditional functional support to the product but also saves the environment from all its harmful effects (Lee and Choi, 2020). There are various approaches to implementing and carrying out the eco-packaging practice as a discipline, workmanship, and technological innovation. Conclusively, we can say that the eco-packaging concept revolves around specific themes these are:

- (1) this packaging is made of eco-materials using them in less quantity that has biodegradable and compostable features that can be *“broken down and assimilated by natural means back into common earth elements like carbon, oxygen, and hydrogen”* (Dharmadhikari, 2012; p. 8).
- (2) the manufacturing process of such packaging is using fewer resources as raw materials during production (Li, 2012), the packaging raw materials are renewable and recyclable (Dharmadhikari, 2012), and
- (3) it has an eco-friendly design and structure that adds reusability features in the packaging (Holdway et. al., 2010).

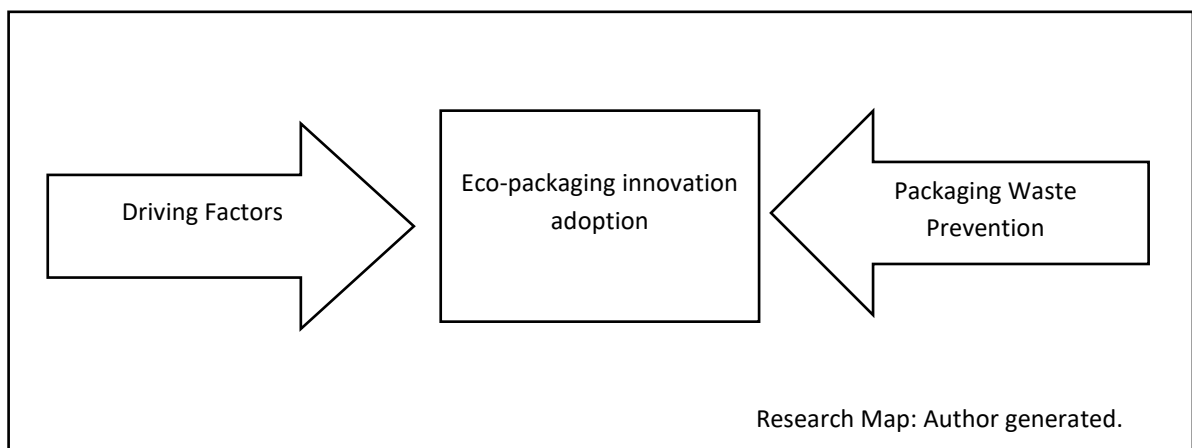
The previously explained statements, certainly, ought to be disclosed on the packaging straightforwardly and expressly to buyers (Kim and Seock, 2009). We can conclude the concept of eco-packaging concept with the understanding that it is a circular economy and close loop supply chain model that emphasizes recycling, reusing, and renewal of the materials and energy required for the whole process.

All types of brands either they are big or small use eco-design and eco-packaging in their marketing strategy. For instance, Coca-Cola Company is using an eco-deign approach for its packaging and introduced Plant Bottle packaging that is made of natural plastic derived from sugarcane instead of petroleum-based virgin plastic (Magnier and Crié, 2015). L’Oréal claims that its product packaging will be completely reusable, rechargeable, compostable, refillable, and recyclable in 2025 (Treviño, 2019).

The study's objectives regarding eco-packaging innovation will be explained in relation to the study's setting, which is the UK's food and drink industry. This chapter will also highlight the need for and importance of this research with this specific field. It will also consider different external drivers, the manager's role in the decision of eco-packaging innovation adoption eco-capabilities serving as internal promoters for industry businesses' adoption of eco-packaging innovation and the impact of eco-packaging innovation adoption on waste prevention and green brand image. At the end of this chapter main points will be highlighted to concludes the chapter.

To understand different drivers for eco-packaging adoption for food and drink companies, it is imperative to provide a full and comprehensive interpretation of the context of this study. This study is cantered around empirical work and scholarly papers available on eco-innovation in general, eco-packaging innovation and waste reduction. The following figure is explaining the focus of the research.

Figure 2.1: Focus of the study



This chapter is explaining the literature available on research constructs, followed by the descriptions of different variables used in this study.

Table 2.1: Definition of Research Constructs

Constructs	Sub-Constructs	Definition	Source (References)
External Drivers	Customers Demand	The willingness and capacity of consumers to buy a certain number of environmentally friendly items at any particular moment or during any given period is known as consumer green demand.	Cuerva et. al., (2014) and Arranz et. al., (2019)
	Competitive Pressure	Competitive pressure is characterised in terms of how a firm affects another firm's incentives to engage in any form of innovation.	Wang et. al., (2012) and Arranz et. al., (2019)
	Environmental Regulations	The attempt to safeguard the environment and human health from pollutants by industrial development takes the shape of legislative rules known as environmental regulations.	Doran and Ryan, (2016) and Arranz et. al., (2019)
Managerial Environmental Awareness	Environmental Risk Awareness (ERA)	ERA is related with managers honesty that whether he is aware of company environmental impact or not? IF he has knowledge about it then he should accept it as to overcome the risks that company will face in future.	Gadenne et. al., (2009) and Peng & Liu, (2016)
	Environmental Cost-Benefit Awareness (ECA)	ECA specifies the environmental costs that the company needs to bear for not working n its environmental strategy and the benefits that the company can get by adopting eco-packaging innovation for reduction in the environmental impact of the company processes and waste prevention.	Gadenne et. al., (2009) and Peng & Liu, (2016)
Eco-Capabilities	Eco-Capability	The capacity of a company to store, utilise, and apply various internal resources to lessen the environmental effect of the company's production process while also enhancing the firm's performance is known as eco-capability.	Ngo and O'Cass, (2009)
	Technological Capabilities	Technological capabilities are composed of concrete technology, immaterial expertise, and the specific knowledge the company needs to build green goods and processes.	Cai and Li. (2018) and Wu et. al., (2020)
		Technological Capabilities, which are the development of human capital (such as skilled managers and workers), and knowledge stocks amassed via research and innovation activity are	Díaz-García et.al., (2015); Sanni, (2018)

		crucial for the growth and dissemination of eco-innovation.	
	Human Capabilities	Human capabilities include hiring and training employees for eco-innovation.	Kabongo and Boiral, (2017)
	Research and Development Capabilities	These are the capacities of the businesses to combine, coordinate, build, and reorganise capabilities and resources to abide by environmental sustainability and eco-innovation.	Chen et. al., (2012) and Berrone et. al., (2013)
Eco-Packaging	Eco-Packaging	Eco-packaging is also termed green packaging and eco-friendly packaging. This packaging is introduced to minimise the negative environmental impact of traditional packaging materials, but it should serve all traditional packaging functions.	Choi and Lee, (2020)
Green Marketing	Eco-Labeling	Eco-labeling can be defined as adding environmental information regarding a product or packaging to inform relevant consumers.	Ibanez and Grolleau, (2008, p. 55)
	Green Message Display	A green message display is a green marketing tool to explain specific packaging features to communicate the greenness of packaging.	Smith and Brower, (2012)
	Environmental Advertisement	It refers to the product promotion as made with eco-friendly materials and will not harm nature during its whole life cycle.	Wood, (2016)
Green Brand Image		A brand's green image is the combination of consumer impressions that the company cares about the environment and is committed to protecting it.	Chen, (2008)
		Green image is linked to a consumer's emotional connection with a specific brand.	Malik et. al., (2012)
Waste Prevention		Waste prevention referred to different actions regarding a specific material or substance to reduce the amount of waste created by it. These actions include increasing the life span of that material by	(European Commission, 2008)

		reusing it, decreasing the number of harmful ingredients in that material, and decreasing the impact of that material on human health and the environment.	Wilson et. al., 2012)
Source: Author Generated			

2.1 Systematic Literature Review

Systematic literature review methodology has been used many times in environment, sustainability and circular economy approach related research (Badi and Murtagh, 2019; Carl et al., 2019; Ulgen et. al., 2019; Zhao et. al., 2019). This chapter will summarise and explain different scholarly articles and published papers comprehensively on eco-innovation related to food and drink packaging. The search for the available literature used literature search in Business Resource Complete, Scopus, and Google Scholar. Scopus is considered as a trusted platform with quality research than google scholar and web of science. According to Mongeon and Paul-Hus, (2016) 50% of Scopus articles can not be find in web of science.

This systematic literature review methodology is adopted to identify different dimensions and terms linked with packaging’s environmental aspect and waste management. This systematic literature will also highlight and critically evaluate strategies of different food and drink companies based on their packaging waste and environmental efforts. The search string for this literature begins with finding main literature review on packaging for environment and sustainability and waste prevention. Different search terms were used to find articles and research. On Scopus following research words were used to find articles keywords, title and abstracts that are more relevant to this research.

- “Eco-innovation” AND “packaging” AND “waste” AND “sustainable”
- “Eco-innovation” AND “packaging” AND “waste” AND “environment”
- “Eco-innovation” AND “packaging” AND “waste” AND “eliminate”.
- “Eco-innovation” AND “packaging” AND “waste” AND “reduce”.
- “Eco-innovation” AND “packaging” AND “waste” AND “recycle”.
- “Eco-innovation” AND “packaging” AND “waste” AND “Plastic”

Main words and synonyms used to search articles related to this study are explained in the following table:

Main Word	Searched	Synonym 1	Synonym 2	Synonym 3	Synonym 4	Synonym 5	Synonym 6

Food (Packaging)	Food	Takeaway	Takeout	Ready	Grocer	Beverage	Drink
Sustainable (Packaging)	Sustain	Environment	Ecology	Eco	Circular	Green	Nature
Life Cycle Assessment (Packaging)	Life Cycle Assessment	LCA	Life Cycle Analysis	Reusable Packaging	Disposable Packaging	Renewable Packaging	
Material (Packaging)	Paper	Plastic	Glass	Cardboard	Metal	Carton	Edible
Drivers (Packaging)	Adopters	Influence	Variables	Factors	Effect		
Waste Management (Packaging)	Waste Prevention	Waste Reduction	Waste Minimise	Waste Disposal	Waste Treatment	EPR for Packaging waste	
Source: Created by the researcher							

Snowball strategy was used to collect all relevant articles focusing on eco-packaging innovation that were left behind while searching articles for this research. For literature review snowball strategy following steps were adopted to search remaining articles related to eco-packaging.

- Step 1: Systematic references list was made for the articles published between 2015 to 2022.
- Step 2: Journals were organised within the scope of this study (Ecological, Eco-innovation, sustainability, and packaging waste). This search criteria exclude the articles and journal available within pharmaceuticals, chemistry, newspapers, and non-academic Journals)
- Step 3: Article titles and abstracts were reviewed to use only relevant articles in the main study.

Article from different other disciplines i.e., science, chemistry, maths, pharmaceutics, biochemistry, computer science, health etc were removed from the search. Article abstracts were reviewed. This abstract reading stage also removed some articles as they were not more relevant to this study. Although these articles were using terms packaging, sustainability, waste, and environment but they were removed at this stage of research as:

- Articles were focusing on different other fields on studies. waste treatment, education, veterinary, chemistry.
- Articles were not specifically related to the food and drink companies packaging or food and drink packaging. They were based on construction, toys manufacturing companies, electronic equipment's, water treatment, and components manufacturing companies.
- Some articles were not specifically related to stake holders as drivers for eco-innovation adoption. Instead of that these articles were discussing whole sellers, retailers, local recyclers, consumers, raw material suppliers and product distributor.

- Articles were explaining recycling techniques of different packaging materials for waste prevention. These articles were explaining different technologies that can be used for recycling packaging waste.

Snowballing techniques also helped to find different books, conference papers, and journal articles. To reduce biasness, the findings were discussed with the supervisor during regular meetings to settle any growing contradictions in interpretation and to explain uncertainties. After that all papers were arranged/categorised in terms of their main objective. Now we have

- Research focusing on different other materials that can be used instead of plastic packaging to eliminate waste.
- Research focusing on consumers demand/ behaviour as a driver to reduce the use of traditional packaging or increasing the adoption of eco-friendly packaging materials.
- Research focusing on government policies, legislations, or reforms to reduce packaging waste.
- Research focusing on different technologies that are necessary for the adoption of eco-friendly packaging and help companies in their waste management initiatives.
- Research focusing on the impact of packaging waste on environment.
- Research focusing on from capabilities necessary for the adoption on packaging eco-innovation.
- Research focusing on how different producers can move towards more sustainable and environment friendly packaging by using different new technologies and packaging materials.

It was found out that the main journals focusing on emerging fields of environment friendly changes in the packaging for waste prevention are Journal of Cleaner Production, Resources, Conservation and Recycling, Waste Management and International Journal of Life Cycle Assessment and Journal of Business Management. These articles were categories into drivers (internal and external), environment, waste management and company's (Brands)categories.

FINDINGS OF REVIEW OF LITERATURE ON ARTICLES FOCUSED ON DRIVERS OF ECO-INNOVATION FOR PACKAGING

Most of the studies target plastic packaging as a material that needs to be alter with environment friendly packaging material. Articles also focused on increasing the recyclability and reusability of the food packaging to make it more environment friendly. Some studies introduced biodegradable plastic materials as an alternative to plastic packaging. Studies on eco-innovation also explained several driving factors for the companies to adopt eco-friendly packaging that can have positive impact in terms of waste reduction and better brand image. The result

collected from systematic literature review is arranged in form of categories. These categories are not correlated with each other and are arranged by the researcher for own convenience during analysis. Following table is explaining systematic literature review categories used in this study.

Drivers/Instruments	Usage	References
Consumer Behaviour Customer purchase decision (Customer Demand)	Consumer behaviour theories are used in these studies to access the impact of sustainable packaging on consumer buying behaviour and the demand of eco-friendly packaging by buyers on the decision to use more eco-friendly packaging.	Magnier and Crié, (2015) Chekima et al., (2016) Jerzyk, (2016) Lacasse, (2016) Hurley et al., (2017) Magnier and Schoormans, (2017) Steenis et al., (2017) Steenis et al., (2018) Hao et al., (2019) Petljak, Naletina and Bilogrević, (2019) Nemat et al., (2019) Kapoor and Kumar, (2019) Singh, Rajendran and Wahab, (2019) Krah, Todorovic and Magnier, (2019) Nguyen et al., (2020) Taufik et al., (2020)
Regulations/ Economic Instruments (Environmental Regulations)	Deposit Refund System, Extended Producer Responsibility, Packaging material standards, Incineration Tax, and restrictions, ban on non-recyclable packaging materials, Ban on the use of Traditional plastic, Separation of packaging and non-packaging waste	Kye, Lee, and Lee, (2013) Wang, (2014), Martinho, Balaia and Pires, (2017), Li and Zhao, (2017), Kunz, Mayers and Van Wassenhove, (2018), Wagner, (2020), Friedrich, (2020), Nwafor and Walker, (2020)
Competitive Pressure		
Environmental Packaging materials, New Design with reusability and other environmental features (Eco-friendly packaging)	Materials that can be used as packaging material instead of traditional plastic. These materials are recyclable and biodegradable. Redesigning for resource consumption, returnable and recyclable features.	Balasubramanian and Raiyani, (2014) Shen, Fatehi, and Ni, (2014) Nelson et al., (2016) Zhu, Romain, and Williams, (2016) Sustainable Packaging Coalition, (2016) Saibuatrong, Cheroennet and Suwanmanee, (2017) Rabnawaz <i>et al.</i> , (2017) Mondal et al., (2019) Barron and Sparks, (2020)
Technology (Technological Capabilities)	Waste collection, waste treatment, separation of reusable/recyclable waste	Wollny et al., (2001). Jung, Matsuto and Tanaka, (2006). Dahlén et al., (2007)
Eco-Capabilities		
Human Capabilities		

Impact of eco-friendly packaging	Waste prevention, waste reduction, reuse, increased packaging waste recycling	Shekdar, (2009)
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Mainly there are two types of eco-innovation drivers explained by majority of the studies on eco-innovation (Maldonado-Guzmán and Garza-Reyes, 2020). External drivers consist of institutional pressure, social pressure and pressure from the customers that put responsibility on a firm to adopt environmental strategy (Daddi et. al., 2016). Institutional theory supports the fact that if a firm want to have public and government support it must comply with external pressure.

Articles Focused on the External Driving Factors

Existing literature on eco-innovation and environmental concern is divided into three major pressures: regulatory pressure in form of environmental policies, customers green demand and competitive pressure. Regulatory pressure and competitive pressure are termed as institutional pressures in institutional theory (Hojnik and Ruzzier, 2016; Cai and Li, 2018). Most of the time, the intended and governing factors based on industrial strategy or government environmental regulations for eco-innovation are what drive the various sorts of eco-innovation efforts (Cassells and Lewis, 2011; Hojnik and Ruzzier, 2016, Sanni, 2018). They also suggested that companies are environmentally responsible and want to contribute to environmental protection, but small companies did not have funds for long-term investment in innovation. Contrary to that medium and large firms have the resources to invest in innervational changes, so they have their innovation management policies (Han and Chen, 2021).

There are also some studies that did not consider environmental regulations as an important and forceful driver for eco-innovation. For Instance, Cai and Li, (2018) in their study proves that external regulatory pressure from the government for the adoption of eco-innovation is negatively affecting the firm decision and not positively triggering their behaviour. Another similar result was discussed in the study by Eidat et. al., (2008). He also found negative relationship between public policies or regulations for environment and adoption of eco-innovation.

Furthermore, Mady et. al., (2022) in his study on SME's he concludes that there is no direct relationship between regulation policies and eco-innovation adoption by a company. Henceforth, environmental regulations cannot provide a positive force to the companies for the adoption of eco-innovation. These companies should be willing themselves for these changes.

It should be a choice not a force. Thus, regulations or policies relationship with eco-innovation is still very controversial.

Research has identified many factors that influence the adoption of eco-innovations and has applied these factors to various eco-innovations, including as eco-product, eco-packaging, eco-process, eco-management, eco-technological, and green marketing innovations. Specific drivers related to eco-packaging selected for this research are explained below:

Activities of different firms within a sector influence the other companies in the same industry through their activities and strategic decisions. Many times, one company tries to be a part of environmental activities and management trends after observing competitors. These competitors are the main reason behind environmental changes within a company (McDaniel and Rylander, 1993). The new adopters can also gain a competitive advantage as the first mover in an industry.

Eco-packaging is often considered costly by the new adopters therefore most of the time they are not attracted to new green or eco-packaging as the first movers. Similarly, some consumers cannot find attraction in green products and packaging as compared to traditional packaging and they did not create enough pressure on the companies for its adoption. In such situations, only large firms and leaders of the market take the risk of eco-packaging adoption. Thus, with tight profit margins and by gaining first mover advantage these large firms give competition to the other firms in the same sector (Romis and Coslovsky, 2019). In recent years eco-design has become a creative aspect for leading the market by producers and distributors and it has created a big competition between private brands and national brands for the adoption of new innervational packaging designs (Manzur et. al., 2011).

Eco-packaging has become an innovative tool for companies to compete and improve their profit. Companies are adopting this eco-innovation as the best approach for sustainability (Jiménez-Guerrero et. al., 2015). Eco-design innovation in packaging is helping companies differentiate their products and attain market positioning by communicating environmental efforts and showing itself as an ambassador of environmental improvement in the market. Thus, environmental innovation in packaging can create a huge competitive pressure by differentiation (sales growth) of a rival company, competitive advantage, decrease in costs, etc (García and Prado, 2008). Eco-packaging innovation is also related to ecological, social and economic sustainability therefore it has a competitive price as compared to traditional packaging to create a competitive environment and encourage companies who have already invested in such practices (Aksentsyeva and Shunevich, 2021).

Environmental packaging, which is also termed eco-packaging, green packaging, recyclable packaging, eco-friendly packaging, eco-design for packaging is becoming of utmost importance for human health and environment protection, therefore, its demand is also increased by the consumers (Wandosell et. al., 2021). Literature on eco-packaging is divided into two perspectives consumers' perspectives and regulations for eco-packaging. Therefore, the rising demand for and emphasis placed on eco-friendly packaging by customers to preserve the environment is one of the most crucial reasons for the introduction of eco-packaging innovation (Qing and Guirong, 2012 Nguyen et. al., 2020). Kassaye, (2001) in his study on large firms' green strategies finds that most important reason for the of green actions and environmental policies within a firm was because of the increasing demand of the consumers. Change in product packaging is directly linked with its demand and an increase in responsible clean packaging is favourable for both companies and the environment (Boesen et. al., 2019).

The consumers' perception of eco-packaging is based on specific features including its recyclability, biodegradability, material, design, and impact on the product price (Nguyen et. al., 2020). Similarly, a consumer's level of knowledge and concern for the environment determines his buying intentions (Prakash et. al., 2019). According to a survey on people in the USA, France, and Germany, customers are more worried about a product's packaging towards the end of its useful life than whether it is recyclable, biodegradable, or reusable. Another study on the young consumers living in Denmark concludes that they are very much interested in the packaging of liquid products from their shelf life to their disposal (Boesen et. al., 2019). Some other scholars ascertain that eco-packaging has influence on the buying behaviour of responsible consumers (Jerzyk, 2016; Slusarczyk and Kot, 2018). Consequently, people are prepared to spend more to purchase an environmentally friendly packaged good (Sodhi and Singh, 2017).

The importance for eco-friendly practices is increasing globally for environmental protection. Due to this, many environmental regulations including eco-packaging or sustainable packaging are getting important as an aspect of sustainable development and to decrease pollution and waste due to traditional packaging (Wong et. al., 2012). Different production firms are complying with the eco-innovation rules including CO2 emissions, recycling, reduction of water, less use of other natural resources (Khanna et. al. 2009; Horbach et al. 2012). According to a study on eco-innovation by Green et. al., (1994) The acceptance of eco-innovation is greatly influenced by environmental restrictions. He studied product eco-innovation across three factors for boosting eco-innovation in the company. These are: (1) already existing

environmental regulations, (2) creating environmental regulations anticipation, and (3) growing market perception of green products.

County-wise and worldwide laws, taxation, and regulations are encouraging producers to make their packaging more sustainable to save human health and the environment (Qing and Guirong, 2012; Nguyen et. al., 2019). Companies are making strategies for making their packaging sustainable because of the consumers growing demand for such packaging and environmental regulations in form of taxation on the production companies (Nguyen et. al., 2019). To fulfil sustainability initiatives European Union has passed many directives for the countries to introduce regulations for packaging waste management and environmental protection (Da Cruz et. al., 2014). The best example of this initiative is set by Japan by introducing the "*Packaging Container Recycling Law*" that is making liable for the separate assortment and recycling of containers, food packaging waste, and solid waste (Nakatani et. al., 2020).

In Germany, there are strict environmental regulations for packaging and waste disposal they have specific requirements set by the regulatory authorities for product packaging and food delivery. Food production companies are rigorously following these laws and introducing eco-friendly packaging materials with no environmental pollution (3). Countries with their own packaging waste management laws are gaining a reputation in international markets by introducing green packaging (Chen et. al., 2016). The same study highlighted that developing countries are struggling to compete with developed countries as the manufacturers of developing countries are not fulfilling the strict packaging requirements set by the international markets.

Articles Focused on Internal Driving Factors

Many studies emphasize managerial cognition for eco-innovation (Chou et al., 2012; Cordano et al., 2010; Kim, 2013). Several studies on managerial concern for environment used planned behaviour theories to explain eco-innovation and manager attitudes and intentions for environmental decisions (Cordano et al., 2010; Zhang et. al., 2013). To explain managerial environmental concern and decisions for the adoption of eco-packaging innovation, Xueron and Yang, (2016) employed managerial cognition theory based on many drivers for eco-innovation in their study.

An important factor in the implementation of the eco-innovation approach is environmental leadership (Cai and Zhou, 2014). Understanding regarding environmental issues and the rules governing the use of eco-friendly methods may directly influence the acceptance of eco-innovation, and then top managers can persuade staff members to alter their attitudes toward

the environment (Arnold and Hockerts, 2011; Chen et. al. 2014). These managers can create norms in the organisation for innovation and creative changes that are needed for environmental protection (Dalvi-Esfahani et. al., 2017).

The adoption of various eco-innovations and environmental efforts by the company is closely correlated with managerial environmental concern for the issues and harms to the environment caused by the manufacturing process (Mirata and Emtairah, 2005). Thus, top management commitment and concern is very essential. Adams et. al., (2015) explained it as *“the extent of senior-level managerial commitment, support, and leadership in the pursuit of corporate environmental preservation and deployment of corporate environmental practices”*.

Managerial knowledge regarding the environmental costs the company is bearing as a part of environmental regulations fees or taxes plays an important part in his decision to devise an environmental management strategy within his company (Eiadat et. al., 2008; Agan et. al., 2013). For manufacturing organisations, managers' expertise, concern, and awareness are the most crucial eco-innovation drivers (Qi et. al., 2010). If the production company is a market-oriented firm, a managerial attitude towards eco-innovation in the market help company to boost innovativeness (Dibrell et. al., 2011). We may thus conclude that manager environmental knowledge and concern has a favourable impact on the company's responsiveness to environmental rules and eco-innovation (Tseng et. al., 2013).

Based on the management cognition theory, managers' environmental concern is seen as a major internal motivator for the company's adoption of various eco-innovations. Managers who have experience and knowledge of environmental regulations and taxation costs related to these regulations are very much interested in any type of environmental initiative for the company to decrease this environmental cost (Naffziger et.al., 2003). Therefore, many managers are designing their eco-innovation strategies as a best practice to overcome their environmental concerns (Eiadat et. al., 2008). Managerial cost awareness is also linked to green purchasing by the company (Papagiannakis and Lioukas, 2012) along with the promotion of organisational collaboration for environmental representativeness (Yen and Yen, 2012).

Eco-capability is linked to the proper utilisation of a firm's internal resources for better environmental performance and by using these internal organisational resources gaining eco-innovation. Sustainable development as defined by the World Commission on Environment and Development (WECD, 1987) Describe eco-capability as a key factor in reducing a company's environmental effect. Ngo and O'Cass, (2009) explain eco-capability as the business's capacity to possess, utilise, and use various internal resources in order to reduce the environmental effect of the firm's production process while also enhancing firm performance.

After exploration of the literature available on capability we can say that eco-capability is concerned with; (1) using an already existed firm's internal assets to improve the performance of several other capitals (Helfat and Peteraf, 2003); and (2) creating environmental resources with a firm in such a way that they cannot be separated easily so that it can improve firm's environmental performance (Teece, 2009). Thus, eco-capability is directly linked to an organisation's environmental positioning and innovativeness (Gabler et. al., 2015). He identified eco-capability as a combination of technology, human and business environmental innovation (Gabler et. al., 2015).

Technology is regard as an imperative requirement for the adoption different types of eco-innovation as new change whether it is in form of design or material needs some different techniques to deal with (Horbach 2008). When a firm develops its technological capabilities by resourcing green technology (pollution control, less water waste, less energy usage) it leads the firm to successful eco-innovation (Doran and Ryan 2012). Technology-related factors are the main determinant of any type of eco-innovation adoption (Bossle et. al., 2016). General innovation theory also emphasizes the technological capabilities for the decision of eco-innovation adoption (Rosenberg, 1974; De Marchi, 2012). The manager's knowledge, dedication, and care for the environment are significant resources that support his decision to incorporate eco-innovation in his company (Wittmann et. al., 2009; Bocken et. al., 2014).

According to Nidumolu, et. al., (2009) A recently popular marketing tactic that aids businesses in promoting their environmental initiatives is the creation of green technologies. Technological capabilities always rank first among internal elements when we think about the reasons that drive the introduction of eco-innovation (Del Rio et. al., 2016; Frank et. al., 2016; Tsai and Liao, 2017). Technological capabilities include the knowledge, skills, and expertise needed to create and introduce technological innovation (Hansen and Ockwell, 2014). Innovation theory also supports the fact that technological capabilities are considered as important element of the eco-innovation activity (Baumol, 2002). Technological capabilities are showing the absorptive capacity of a business in which an investment made in the research and development for understanding the technological capabilities of the firm spread with time in such a way that it brings specialization and advantageous eco-innovation (Danko, 2017). Businesses invest in clean technologies for eco-innovation so that they can decrease the effect of firm activities on the environment (Carpinetti, 2008).

There are different definitions of eco-capabilities bellow from different research:

Table 2.3: Technological Capabilities Definitions

Definitions	References
Technological capabilities are the abilities required to generate and introduce technological innovation including knowledge, skills, and experience	Figueiredo, (2001)
Technology capabilities are the skills generated internally within a firm through knowledge generation that are required to create and manage technological change in the company.	Voudouris et. al., (2012)
Technological capabilities are the set of tangibles (technology) and intangible (knowledge and experience) assets considered necessary to adopt green innovation in products and practices.	Cai and Li, (2018)
Technological capabilities categorised as internal firm abilities to use available resources for research and technology improvement effectively for the adoption of eco-innovation.	Wu et. al., (2020)

Employees are a company's most valuable intangible asset, and their knowledge, skills, and capacities are directly related to the adoption of eco-innovation. So, a company must maintain their employee's capability along with maintaining their trust, expectations, and motivations for the positive adoption of green innovation (Morsing and Oswald, 2009; Bonn and Fisher, 2011). Human capabilities help companies to integrate their ideas and considerations for eco-innovation (Liao and Tsai, 2019). But unfortunately, these human-related constructs are not a prominent part of eco-innovation studies (Ortega-Lapiedra et al. 2019). Therefore, we cannot find enough resources to prove the relationship and importance of human capabilities in form of employee education and training with different types of eco-innovations.

Trained and experienced human capital is a valuable capability of the firm to connect external demands for the eco-innovation and company's efforts (Muscio et. al., 2017). Human capabilities are also the main driving force within the company for innovation and the learning process (De Marchi, 2012). Large companies with better investment opportunities can have better human resources that enforce environmental activities and help the company to eco-innovate (Baylis et. al., 1998 Clayton et. al., 1999).

The creation of eco-technologies, which are necessary for the implementation of eco-innovation, depends on research and development skills. (Machiba, 2010). Efficient research and development capabilities are helping young international new ventures (INVs) to get technological innovation within the technology industry and help them to trade their competitive advantage (Oviatt and McDougall, 1994). Research and development were also viewed as a significant factor in the literature on eco-innovation when it came to a company's

competitive advantage. A firm's commitment to innovation depends on its investment in research and development that resultantly improves the company's innovation performance (Ren et. al., 2015).

Companies are creating environmentally friendly products as a result of their investment in R&D to grow their market share (Garcia and Mohnen, 2010). Additionally, when companies are improving technology by using research and development for innovation purposes, it contributes to the innovation in the product that further leads to process innovation and other types of innovation achievements by the company (Trott,2011). In the competitive market situation, research and development capabilities are helping companies to compete by using firms' expertise gained by research and development (Lee, 2009). Different studies prove a strong relationship between research and development capabilities with product innovation (Garcia and Mohnen, 2010; Lin and Wu, 2010; Trott, 2011; Wanga and Wang, 2012; Tseng et. al., 2012) as well as process innovation (Wanga and Wang, 2012; Tseng et. al., 2012; Annique Un and Asakawa, 2014) to reduce the production cost and getting the competitive advantage with better quality of products with less environmental effects.

Performance Outcomes of Eco-Packaging

In accordance with Charter and Polonsky (1999), "*green marketing*" is the advertising or representation of a product centred on its advantages for the environment (Lee, 2008). The green marketing efforts tries to create awareness in consumers mind that the company is responsibly working on its strategy to reduce emissions and other harmful effects on the environment during its [production process. When a corporation is trying to change its image in the minds of its customers through marketing, packaging plays a significant influence. Green marketing is a valuable source of knowledge sharing and help to communicate positive corporate strategy to the consumers (Prakash, 2002).

Furthermore, controlling the conventional promotion mix (product, price, place, and promotion), demands a knowledge and understanding of public approach processes. Green marketing is likewise firmly tangled with issues relating to environmental science and natural sustainability. For example, extended producer responsibility (EPR), life-cycle assessment, material use and asset streams, and eco-effectiveness. Hence, the issue of green marketing involves an expansive and large-scale knowledge, having significant consequences for business technique and public strategy (Prakash, 2002). According to (Rahbar et. al., 2011) green marketing is the combination of three tools (1) Eco-labelling; (2) Eco-advertisement, and (3) eco-branding.

Eco-labelling is considered a marketing strategy to deal with environmental problems related to the firm. Eco-labels are the highlighted symbols used by the companies to ensure buyers that they are environmentally responsible buyers and contribute to a better environment by choosing the product of this company (Bostrom, 2006). According to (Søerserskov and Daugbjerg, 2011) eco-labels perform two main functions (1) information spreading regarding environmental features and (2) explaining the corporate social responsibility of the firm. These ecological labels help consumers to trust the product during the buying process they are selecting green products (Rahbar et. al., 2011).

Companies are using different keywords including biodegradable, eco-friendly, recyclable, safe for the environment, and ozone friendly to fulfil the first information function of eco-labels (D'Souza et. al., 2006). Many developed countries around the world including America, Germany, and Canada are considering eco-labels as sustainable development criteria for production companies (Nguyen and Le, 2020). Therefore, companies in developed countries are using eco-labels to bridge the information gap between buyers and sellers. Atkinson and Rosenthal, (2014) found that eco-label product prices are relatively higher than the other products as the companies have certification for eco-labelling by declaring their products as eco-product innovation.

Consumers are agreed to pay more than the normal price for eco-labelled commodities as they understand the need for time to bring more environment-friendly products (Prieto et. al., 2016). Nguyen and Le, (2020) studied the outcome of using eco-labelling in terms of eco-friendly buying behaviour explain three purposes to use eco-labels includes (1) to show business efforts towards policies and messages communicated by public organisations; (2) to show that the product is better than before and eco-friendly; (3) eco-innovation introduced by the business as a strategy and showing care for the environment.

According to Easterling et. al., (1996) if a company wants to get popularity based on its environmental advertisement, then it must introduce an environmental strategy for that. According to Hartmann et. al., (2005) there are two newly created positioning tactics of green brands that are very common nowadays. These are known as functional dimension and emotional dimension. They conclude their study based on cars, with the findings that green brand positioning created by green brand strategy is positively influencing the brand stance as the emotional dimension, is very effective for green brand positioning.

According to Rivera-Camino, (2007) greening process is an uneven process that needs different green marketing strategies based on the types of stakeholders you want to target. So, we can conclude that the company's whole marketing strategy must include green marketing as a vital

component if it wishes to excel in any kind of eco-innovation (Menon and Menon, 1997). Green advertisement is used as a device to showcase these environmental innovation efforts by the firm (Sheehan and Atkinson, 2016). Green advertisement is solely responsible to explain environmental efforts, green activities, and green functional properties of the product, process, or packaging (Ghodeswar and Kumar, 2014).

Alniacik and Yilmaz, (2012; p. 209) explain green advertisement as *“any advertisement that unequivocally or certainly addresses the connection between an item/administration and the biophysical condition, advances a green way of life with or without featuring an items/administration and presents a corporate picture of ecological be duty”*. Eco or green advertisement is used as a publicity stunt by the companies to create an image in the consumers' minds that due to certain environmental efforts the product is good for the planet (Kumar et. al., 2017). These green advertisements try to create a connection between the natural habitat and company activities that the company is accomplishing its environmental responsibilities towards its natural duties (Schmuck et. al., 2017). Green advertisement is *“a critical aspect of green marketing that conveys greenness in items, administrations, practices, and procedures of associations”* (Kumar and Kumar, 2017; p. 71).

The green image is studied as a part of the environmental or green practices adopted by businesses or brands (Bekk, et. al., 2016). Zameer et. al., (2020) explains the green brand image in such a way that if green, eco, or environmental aspect are explained as a part of the brand or product and slowly it becomes a part of the belief of customer regarding this product as environment friendly then the customers' impression for the product is called green brand image. From his point of view, the green brand image came into existence from the green or eco initiatives taken by a firm. According to the consumers perspective, a green image remains linked to the environmental practices of the firm and how a firm is decreasing the damage to the environment through its efforts in the production process (Zameer et. al., 2020).

Companies are showing environmental responsibility by adopting ecological initiatives for sustainable development. These ecological efforts are establishing a green image in the market for the company (Famiyeh et. al., 2018). According to the resource-based theory innovation and creativity are two essential elements for designing differentiation for a firm. Zehir et. al., (2015) in his study found that there is a correlation among innovation, differentiation, along with the green image. Firm resources and capabilities are also linked with the green brand image as suggested by Zameer et. al., (2018) internal and external sources (employees and customers) are very important to bring a positive environmental image to the company.

Eco-Packaging and Waste Prevention

Waste prevention is an essential requirement for the attainment of a circular economy and sustainability (Bortoleto, 2015 European Environment Agency, 2015). Waste prevention is the best solution for waste reduction in the economy. According to Eionet, (2015) The European Waste Framework Directive requires member countries to announce their waste prevention programs to promote financial development and decline the effect of waste age on the climate. Waste prevention mostly occurs before the product, materials, or substances are considered waste. different measures are introduced to reduce the hazardous materials and quantity of actual material (Vancini, 2000).

Waste prevention, according to the European Environmental Agency (2015), is the practise of preventing and managing waste across the entire life cycle of a substance or product. According to Arcadis Belgium, (2010) waste prevention is only linked with reusing the material or product or decreasing the harmful substance from the specific material, but it does not include recycling as waste prevention occurs before the usage of that thing. Opposite that (Tucker and Douglas, 2007) includes reusing function by the households in waste prevention. Whereas in literature we can often read reduction, minimisation, and prevention as synonyms words to each other.

Waste prevention is also considered an essential part of the circular economy with zero waste. To improve production businesses' ability to manage their trash, several industrialised nations are encouraging waste avoidance (Parker et. al., 2012). Through a programme, the UK's Department for Environment, Food, and Rural Affairs (Defra) gathers the waste minimization practises employed by businesses in order to formulate future UK development policies (Wilson et. al., 2012).

According to Coggins, (2001) packaging industry waste prevention measures should include reduction of hazardous materials (heavy materials), design packaging with reuse and recycling features, less use of composite materials in packaging, manufacturing eco-designs with eco-materials, using fewer materials for packaging manufacturing, and health and safety information should also be displayed on the packaging.

Conclusion

Research is specifically focusing on the increasing the adoption of eco-packaging by food and drink companies for the reduction of packaging waste. Most of the food and drink packaging is plastic. Most of the previous research are focusing on sustainable supply chain management, less use of energy and sustainable logistics for the sustainability. Although these are also

important but packaging waste specifically plastic packaging from food and drinks is a warning for the environment and people.

Additionally, existing studies are not linking problems arising from plastic waste with the brand owners. So, that they can understand that they need to address this issue and consider them while taking decisions regarding their product packaging. Similarly, there is less research on the internal capabilities that help a firm to easily switch from plastic to eco-friendly packaging to tackle waste.

Furthermore, waste prevention is studied at different level from municipal waste or policy making perspective. As waste is considered as interdisciplinary topic therefore, literature specific to packaging waste is very fragmented. Due to this literature fragmentation, there is less theoretical literature and holistic view available for the company owners to understand the impact of this packaging waste on their brands. So, it is utmost essential to form an integrated study that combine technical and environmental research for brand owners to understand current situation and the social changes happening around them.

In addition, existed research addresses the importance of eco-packaging for the reduction in waste, but they did not emphasis on removing plastic in the packaging to make it more eco-friendly. Although, some scientific studies show the potential to introduce recyclability feature in the plastic by technological advancement. There are also new packaging materials are available that are easily collectable, reusable, and recyclable. But still many food and drink companies are not focusing on the aim to reduce waste by changing their packaging material. These companies need to understand the importance of eco-packaging for their brand and long-term benefits attached to it.

In conclusion, we can say that there are many studies available on the problems associated with the plastic waste, but food and drink sector is still the most packaging waste generated sector. Plastic and other packaging waste collection and recycling figures are also not very attractive. So, the research is needed to attract food and drink sector towards much needed change in the packaging to prevent waste.

Previous Research on Plastic Packaging Waste Prevention

Reference	Driver	Brief Description	Theoretical Approach	Outcome	Method/ Research Setting
Livingstone and Sparks, (1994); Fullerton and Wu, (1998); Fernie and Hart, (2001); Yusuf et al., (2017)	Regulatory Pressure or Legislations	Policies, regulations, and reforms that have an influence on the firm decision related to their packaging	Natural Resource based view; Innovation based theories	Regulatory Pressure and legislation are very important part of packaging innovation adoption process.	Case study
Kumar et al., (2008); Vernuccio et al., (2010)	Environmental Regulations for packaging	Policies and regulatory reforms proposed by the government to take eco-friendly decisions for the packaging	Eco-innovation, Packaging innovation	Government policies specifically monetary reforms (fines, discounts) are positively related to the firm decision of ecofriendly packaging adoption.	Case Study

Policy Instruments used as drivers for Plastic Packaging waste Prevention

Wang, (2014); Martinho, Balaia and Pires, (2017); Kunz, Mayers and Van Wassenhove, (2018); Friedrich, (2020)	Economic Instruments	Use of Extended producer Responsibility Policy (EPR). Taxes by government or regulatory organisations, Landfill charges, UK Trade Permit Scheme are used to decrease plastic waste within country.			
Li and Zhao, (2017); Nwafor and Walker, (2020); Wagner, (2020)	Regulatory	government restrictions and bans on landfills and incineration, restriction and bans on non-recyclable plastic packaging, Separate packaging and non-packaging waste after or before collection can also help to decrease plastic waste and encourage eco-friendly packaging materials.			
Wollny et al., (2001); Jung, Matsuto and Tanaka, (2006); Dahlén et al., (2007)	Technical Instruments/ Technology	Waste Collection, Waste Prevention, Recycling, and other waste treatments for plastic waste prevention			
Shekdar, (2009)	Strategic Instruments/ Business Strategy	Zero-plastic/Zero-waste strategy, Re-using waste after recycling, Set targets for less packaging waste can prevent or decrease waste from, the economy.			
Reference	Driver	Brief Description	Theoretical Approach	Outcome	Method/ Research Setting

Vernuccio et al., (2010); Pattara et al., (2012); Accorsi et al., (2014); Garcia-Arca and Prado-Prado, (2008)	Stakeholders' requirements for the packaging sustainability	Collaborative approach used by stakeholders for the adoption of eco-packaging as sustainability initiative by the company	Economic theory, Innovation Theory, Corporate social responsibility, Organisation decoupling	Stakeholders can contribute positively for the environmental sustainability of the firm as their demand for the eco-innovation in packaging brings positive outcomes.	Case Study
Chekima et al., (2016); Lacasse, (2016); Hao et al., (2019); Kapoor and Kumar, (2019); Singh, Rajendran and Wahab, (2019)	Consumer Pressure in terms of their perception effecting their buying behaviour	Consumers pressure that affects business marketing strategy and have impact on the environmental decision related to their product packaging.	Consumer behaviour theories, Moral/reasoned decision-making, Theory of Planned behaviour for sustainable packaging	Customers can put moral, ethical and environmental duty on the firm for their packaging related decisions and thus can impact changing traditional packaging material to more environment friendly materials.	Mix-method research
Steenis et al., (2018); Nemat et al., (2019); Petljak, Naletina and Bilogrević, (2019); Taufik et al., (2020)	Product Consumption, post buying behaviour of consumer regarding waste	How packaging characteristics affect buying behaviour of consumer at retail store and post-consumer waste recycling behaviour	Consumer Behaviour theories		Exploratory
Dobon et al., (2011); Accorsi et al., (2014); Manzini et al., (2014)	Eco-capabilities and resources	Describe a conceptual framework outlining the connection between environmental capabilities and the eco-packaging adoption process.	Generic Theoretical Framework	He found that eco-capabilities are an important part of eco-packaging strategy execution by the firm.	Exploratory -interviews
Demirel and Kesidou, (2011)	External policy tools and internal firm-specific factors for eco-innovation	Using the OECD's recommended framework, this section will demonstrate the elements of each category of eco-innovation (2009)	Framework	Environmental legislation, ISO14001 certification, and market-driven cost-saving considerations are beneficial at promoting end-of-pipeline technology.	DEFRA -Quantitative
Ar, (2012)	green product innovation, firm performance, competitive capability, environmental concern	Using empirical data to support the adoption of green product innovation by businesses can help them perform better and become more competitive.	Conceptual Model	Green product innovation has a huge beneficial impact on a company's capacity to compete as well as its performance. Green product innovation and business performance only have a moderately positive link with managerial environmental care.	Questionnaire-based survey
Huang and Li, (2017)	Green Innovation and Performance	Examines the linkages between influencing variables, green innovation, and effectiveness while also looking at elements affecting green innovation.	Framework	Significant forces behind green innovation, especially green product and green process innovation, include dynamic capability, organizational capability, and social reciprocity.	Qualitative -Survey Questionnaire

Chen et. al., (2017)	Excessive Product Packaging, Green Brand Attachment, Green Brand Image	Examine how excessive product packaging affects brand attachment and talk about how green product attitude and green brand image might act as mediators.	Framework	The unfavourable association between excessive product packaging and attachment to the green brand is totally mediated by the green brand attitude and green brand image.	Questionnaires
Ghisetti and Montresor, (2019)	Design and eco-innovation: micro-evidence from the Eurobarometer survey	extending environmental studies' "packed" methodology to "eco-design"	Diagram	The influence of a design's eco-innovation on the firm's choice to invest in it is connected. In turn, it is presumable that design investment is linked to the use businesses make of the design.	Eurobarometer 2015 and 2016 surveys
Yang and Zhao, (2019)	Green packaging, consumers' green trust, and green brand attachment	Environmental protection, safety, package design idea, environmental identity, and convenience are the five factors that affect customers' green trust, which in turn encourages loyalty to green brands.	Framework	Green brand attachment is boosted through green package design, which is a significant predictor of green trust.	Qualitative -Questionnaire
Branska et.al., (2020)	Customer Chemicals Packaging in Concern of Sustainability	to determine how much waste material again from primary packaging of the chosen product may be reduced.	N/A	By switching out the plastic for another substance, change the colour of the packaging materials, using recyclable materials in products packaging, changing the technology used in packaging production, introducing a system for reusing plastic packaging, and using recycling, it is possible to reduce the amount of conventional plastic waste generated for a particular product.	Primary qualitative research
Maziriri., et. al., (2020)	Green packaging and green advertising as precursors of competitive advantage and business performance	To evaluate the effects of green packaging including promotion on manufacturing small and medium-sized businesses' ability to compete and overall performance (SMEs)	Conceptual Model	Green Packaging can help SME's to get competitive advantage in the sector.	Quantitative -Simple random sampling

2.10 Theoretical Foundation for Eco-innovation

This research is using ecological modernisation theory and circular economy practices to explain eco-packaging innovation for waste prevention and green image. Ecological modernisation theory is based on the same concept as sustainable development (Buttle, 2000). This innovation theory proposed that although technological innovation and industrial development are increasing competitiveness economically, it is the best answer to the questions raised by the government on producer responsibility for environmental protection (Murphy and Gouldson, 2000).

According to Berger et. al., (2001), ecological modernisation theory is now used by policymakers to draft environmental policies for an economy. These policies are environmentally friendly and politically feasible for the government (Buttel, 2000; Fisher and Freudenburg, 2001). Therefore, ecological modernization is crucial for preserving the environment due to two key considerations. (1) use in government policies for the environment, (2) increased awareness of environmental pollution by scientific organisations, NGOs, and media to pressurise businesses to think about ecological changes (Janicke, 2008).

Public policies are an important contributor to ecological modernisation as these public procedures forcefully or by facilitating, companies are promoting environment-friendly innovation. If the companies are not doing so, they must face consequences in terms of taxes or fines (Murphy and Gouldson, 2000). It is putting many industries at risk because of polluting firms within an industry. Ecological modernisation theory is effective to understand how companies can use environmental technology, eco-friendly, biomaterials with recycling, less environmental emissions, and waste processing to fulfil their environmental responsibility (Zhu et. al., 2011). This research is using ecological modernisation theory to understand how internal capabilities in terms of technological modernisation are enabling companies to adopt packaging eco-innovation for the environment, waste prevention, and circular economy. The following table is highlighting different studies on different phases of circular economy model related packaging design.

Table 2.8: Previous Research on environment friendly packaging materials for eco-packaging innovation.

	Eco-packaging innovation materials

Article Publishing Year (2014-2022)	Criteria for selecting eco-packaging materials	Reusable and Recyclable eco-packaging material	Biodegradable and naturally sourced agriculturally based eco-packaging materials
2014	Da Cruz et. al., (2014) Luijsterburg and Goossens, (2014)	Ionas et. al., (2014) Lee et. al., (2014)	Dicker et. al., (2014)
2015	Sanyang and Sapuan, (2015)	European Commission, (2015)	El-Wakil et. al., (2015) French Standards, (2015) Ramamoorthy et. al., (2015)
2016	Abdul Khalil et. al., (2016) Babader et. al., (2016) Jeswani and Azapagic, (2016)	Leslie et. al., (2016) Palkopoulou et. al., (2016) Pivnenko et. al., (2016)	Jones et. al., (2017) Abdul Khalil et. al., (2016)
2017	Adidas, (2017) Geissdoerfer et. al., (2017) Harding et. al., (2017) Lambert and Wagner, (2017) Winans et. al., (2017) Romeo, (2017) Rujnić-Sokele and Pilipović, (2017)	Harding et. al., (2017) Lambert and Wagner (2017) Houssier et. al., (2017) Rujnić-Sokele and Pilipović, (2017)	Harding et. al., (2017) Lambert and Wagner, (2017) Rujnić-Sokele and Pilipović, (2017)
2018	Dahlbo et. al., (2018) Dell, (2018)	Eriksen et. al., (2018) Hahladakis et. al., (2018) Hahladakis and Iacovidou, (2018)	Casarejos et. al., (2018) Guillard et. al., (2018) Narancic et al. (2018) Sadh et. al., (2018) Youssef and El-Sayed, (2018) Steenis et. al., (2018)
2019	Demetrious and Crossin, (2019) Šomplák et. al., (2019) Trošanová et. al., (2019)	Groh et. al., (2019) Eriksen et. al., (2019)	Civancik-Uslu et. al., (2019) Shankar et. al., (2019) Dilkes-Hoffman et. al., (2019) Rhodes, (2019) Engel et. al., (2019) Shanmugam et. al., (2019) Girometta et. al., (2019) Marichelvam et. al., (2019)
2020	Czamecka-Komorowska and Wiszumirska, (2020) Ghosh, (2020)	Coelho et. al., (2020) European Commission, (2020) Masmoudi et. al., (2020)	Andreola et. al., (2020) Shen et. al., (2020) Huntrakul et. al., (2020)

	Morseletto, (2020)	Solis and Silveira, (2020)	Pinem et al. (2020) Elsacker et. al., (2020) Havstad, (2020)
2021			Filiciotto and Rothenberg, (2021) NewPack, (2021)
2022	Jones et. al., (2022)	Jiang et. al., (2022) Sarkar et. al., (2022) Jones et. al., (2022)	

2.11 Research Gap

It is a well-known fact that plastic is a very common material for fast moving consumer goods packaging. Many studies also clearly state that small changes in the packaging materials are not enough to cope with environmental problems occurring from food and drink packaging waste. A big change in the food and drink packaging and their treatment is necessary to ensure waste prevention and environmental sustainability.

Changing packaging materials and reducing the use of plastic in the packaging is an important decision that needs to be taken by the cooperation of employees and company stakeholders. Companies are not considering big changes in their product packaging. Studies are available addressing technological difficulties, technological and human capabilities, consumer, or regulatory pressure for the change in food and drink packaging materials. Different researchers work on the identification of factors that can drive eco-innovation (Kemp and Oltra, 2011; Diaz-Garcia et al., 2015 Bossle et al., 2016). These driving factors include institutional pressure by the government through legislation (Kesidou & Demirel, 2011; Berrone et. al., 2013; Bossle et. al., 2016; Kunapatarawong & Martínez-Ros, 2016), strategic drivers including costs reduction and brand image (Demirel and Kesidou, 2011), Customer's demand (Kesidou and Demirel, 2011), manager intension and behaviour (Cordano and Frieze, 2000 and Chou et. al., 2012) and market competition (Rehfeld, et. al., 2007; Horbach, 2008; Lin, et. al. 2013 and Jové-Llopis & Segarra-Blasco, 2018).

But it is very difficult to find a study that discuss the driving factors for the food packaging companies that reduce their waste by introducing eco-packaging. As there is very limited research on the companies understanding the problems created by packaging waste and

successfully changing their packaging. Study on these companies can help others that needs come relevant data and information to change their packaging.

If a study addresses their concerns in form of questions from the companies successfully using eco-friendly packaging, it will help and motivate many others to change packaging to reduce not only their own waste but also waste in the community. So, this study is conducted to understand the status of eco-friendly packaging in food and drink manufacturing sector and to explore the unique relationship between the eco-innovation in packaging and waste prevention. The following two gaps are discovered in the literature:

Gap 1. There is a lack of understanding of main external and internal drivers for the adoption of eco-packaging the food and drink companies.

Gap 2. A very few studies are available for the food and drink companies to understand the importance of eco-friendly packaging to reduce packaging waste.

This research will help to understand how food and drink companies are responding through their strategic decisions to different drivers or external drivers of eco-innovation in terms of eco-packaging adoption? Addressing the environmental packaging demands needs managers' action/response on it but there is less importance given to the role of the manager in the literature for strategic decisions regarding eco-packaging innovation by the firms. Even though, he plays a significant role in the decision-making process for the company's environmental policy on various environmental issues. Therefore, managerial concern is considered as an important driver for the adoption of eco-packaging. Zhang et. al., (2013) in their work shows that social pressure on a firm for environmental strategy is an important driver for the manager that drives him and the firm to work on environmental strategy and the use of cleaner production process.

Adoption of any new type of eco-packaging is a part of changing process within a company. Through which a company transform its plastic packaging to completely new eco-friendly packaging for reduction in packaging waste. Thus, this research has main research question that revolves around changing traditional plastic packaging to eco-packaging and its impact on the food and drink companies. The main research question is: What are the main driving factors that help food and drink companies new eco-packaging that help them to switch from plastic packaging to the zero percent plastic with reduction in waste?

The main research aim is achieved by formulating 4 sub-questions. First, I need to understand the main drivers that are facilitating or motivating the food and drink companies to not use

plastic and move towards less use of plastic based eco-packaging. To get the answer first research question is formed as:

1. What are the most prevalent driving factors that are urging food and drink companies to prevent plastic packaging and adopt eco-packaging.

Every company has different teams and departments for strategic planning or to reform strategies for company's survival in the market. There are different people working in each team or department to decide or give their opinion on a specific issue. It is very important to understand the importance of managerial knowledge and concern in food and drink sector for the decision making relevant to switching from plastic to eco-packaging. This quest leads to the next research question:

2. In what way does managerial environmental concern link with the adoption of eco-packaging innovation by the food and drink companies?

After getting knowledge on the external drivers through first research question, I must understand the internal driving factors/resources important to facilitate the switching process. In simple words I gain knowledge on internal system/process changes incorporated within the company to incorporate changes in their food and drink packaging. This leads to the third research question:

3. Which type of eco-capabilities are required for the adoption of eco-packaging innovation by the food and drink companies?

I also must understand the practical impact of eco-packaging adoption by the food and drink companies. It will help to generate new information in the field of packaging waste prevention. The following research question is formed towards the path to form relationship between eco-packaging and waste prevention.

4. What are the consequences or results of eco-packaging adoption in terms of the less use of plastic in packaging for prevention?

All above mentioned research questions will help to form a good piece of information on different external and internal drivers of eco-packaging to achieve waste prevention by food and drink companies.

CHAPTER 3

THEORETICAL FOUNDATION FOR THE STUDY

3.0 Introduction

This chapter analysed and reviewed the existing research on eco-innovation and eco-packaging innovation. The literature study revealed that there is little research linking eco-packaging innovation and waste prevention, with most studies concentrating on eco-innovation in general. Even though, the food and drink industry generate a significant amount of packaging waste as these products are consumed daily. But still there are surprisingly few studies on packaging waste of food and drink industry and eco-innovation in packaging for the waste prevention that are significant to this industry. The purpose of this research is determining the drivers of eco-packaging and establishing the relationship between eco-packaging and waste prevention to encourage the companies who are still not moving their status to eco-friendly company by changing their packaging.

This chapter will explain and ascertain the theories relevant to this study phenomenon. The major goal of this study is to identify the motivating elements particularly for the eco-packaging innovation with food and drink sector and benefits of this adoption in terms of waste prevention. The researcher finds stakeholders theory, ecological modernisation theory and circular economy model most relevant to the adoption of eco-packaging innovation for waste prevention. This section will also explain institutional theory that has been used by the existed eco-innovation literature and has little connection with the drivers determined in this study.

To clarify the theories relating to eco-innovation, this chapter is split into different sections. Four distinct theories that were examined for their theoretical underpinnings and applicability to this study environment will be introduced and discussed in this chapter. The stakeholder's theory, circular economy model and the idea of ecological modernization seemed most closely related to the eco-packaging innovation as compared to institutional theory. The final section of this chapter will summarise the key ideas from the selected theories that will be applied to this study framework.

3.1 Context for learning the adoption of Eco-packaging innovation.

The researcher considers four different theories from the body of literature to understand the drivers of eco-packaging innovation. This chapter is highlighting how these theories were used by the previous studies and what were the main factors behind the selection of these theories by the existed scholars. The ideas covered in this chapter include the institutional theory, circular economy model, stakeholders' theory, ecological modernization theory. These four theories are selected because they are providing the base to the main aim of the research and research framework.

3.1.1 Institutional Theory

According to Scott, (1987), Institution theory highlights the important duties of institutions and their policies through which different systems work responsibly in society. This theory focuses on the determination of different social, cultural, environmental, and economic regulations that help smooth organisational activities within society (Bruton et. al. 2010; Glover et. al. 2014).

Studies on environmental performance and sustainability also used institutional theory for establishing a link between green supply chain management, sustainability measures, and institutional pressure (Sarkis et. al. 2011). For instance, the institutional theory is applied to the supply chain of the supermarket sector to establish a connection between value chain stakeholders' sustainability practices and sustainable firm performance (Glover et. al., 2014). It has been used to establish a link between environmental regulations, green practices, and social pressure on the firm (Ball and Craig 2010). In this research this theory is explaining the relationship between environmental regulations related to the packaging and eco-packaging adoption.

From the perspective of institutional theory, social pressure in form of pressure from public organisations, industry institutions, and consumers is necessary for companies to increase awareness of environmental policies and their importance (Rivera 2004). This study is also exploring the relationship between social pressure created by consumers and different environmental policies demanding producers to use eco-friendly packaging for environmental protection and as a part of their sustainability initiative.

Institutional theory also argue that the organisational surrounding environment can influence the organisational activities and its culture (North, 2005; Zhou et al., 2017). Therefore, it has been used as a theoretical ground for some studies that are based on eco-innovation adoption. One of the studies based on institution theory conclude that a firm can get many environmental

benefits after the eco-innovation adoption including the decrease in the environmental performance of the firm (Rennings et al., 2006). Eco-innovation adoption also has impact on market performance and social performance. The Market-related effects of eco-innovation mostly depend on market institutions i.e., green marketing and the current market (Triguero et. al., 2013). This research framework is also highlighting the connection between eco-packaging and green marketing as companies are using eco-packaging to promote their environmental responsibility for better brand image. Similarly, the social effects in form of company image and reputation depend on society's perception of environmental practices (Chen, 2008).

Studies that connect institutional theory with eco-innovation have looked at how institutions or regulatory bodies affect the uptake of eco-innovation or green-related innovations (Huang et. al., 2009; Weng and Lin, 2011; Li, 2014), various kinds of eco-innovations with a company (Demirel and Kesidou, 2011; Chen et. al., 2012; Zhu et. al., 2012) and strength of green innovation with different sectors (Berrone et. al., 2013; Aguilera-Caracuel and Ortiz-de-Mandojana, 2013; Aragon-Correa and Leyva-de la Hiz, 2016). Other research also used institution theory to assess the impact of eco-innovation on business performance (Aguilera-Caracuel and Ortiz-de-Mandojana, 2013).

These institutions can take the official shape of rules and regulations or can have informal norms and cultures (North, 1990). Different countries have their own sustainability initiatives and waste management policies. Most of these environmental regulations and waste reduction plans ask for zero use of virgin plastic and demanding companies to use recyclable plastic and other eco-friendly packaging materials for less waste and environmental protection. Organisations are a part of a macro-level organised process in which obedience of institutions provides them with social approval (Berrone et al., 2013).

Environmental studies are using institutional theory as a lens to observe eco-innovation without considering efficiency in the process (Berrone et al., 2013). Institutional theory has three main elements defined as pressure: cognitive, regulatory, and normative (Scott, 1995; DiMaggio and Powell, 1983). All three elements have different instruments and mechanisms through which they affect the eco-innovation adoption by the companies.

According to (DiMaggio and Powell 1983) normative pressure comes from the company employees. As internal stakeholders' employees spread knowledge about the policies and procedures the company needs to follow and if the company is not following them, they can take legal action (Sarkis et. al. 2011). Social actors are also a contributor to normative pressure

on the ecological behaviour of the company (Berrone et al., 2013) as they exert pressure to comply with social obligations (March and Olsen 1989). Thus, normative pressure is not formal but informal pressure that arises from social responsibility and justice (Young and Makhija, 2014). For instance, international standard organisations (ISO) rules ISO14001 are the social standards set by the international organisation, and companies are bound to follow the rules for a better society, a better environment, and a better future.

The regulatory pressure comes from regulatory authorities, public institutions, industrial agreements, and social bodies that can have public forces behind them to influence companies. If companies are not complying with the rule and regulations, they must face certain legal procedures, fines, or taxes (Peterson and Barreto, 2018). For instance, public organisations increase influence on law enforcement organisations, and those organisations then exert pressure on industrial organisations to adopt eco-innovation through environmental regulations (DiMaggio and Powell 1983). For environmental management strategies and ensuring sustainability, these factors are crucial (Kilbourne et al. 2002).

The normative tool does not apply any pressure like the other two cognitive, regulatory elements but it imposes some limitations on the manufacturing firms. For example, if a model is set by the industry as a popular competitor between different firms, then companies try to replicate that model to get success in the industry (Sarkis et. al. 2011). This cognition can be in terms of beliefs and values set within an industry and firms do not have alternatives for them (Peterson and Barreto, 2018). In terms of eco-innovation studies, these beliefs are the standard set by the stakeholders and employees and values are the customer's attitude towards environmental practices within the industry (Cherian and Jacob, 2012).

The advantage of using institutional theory in eco-innovation studies is that it explains why certain firms are adopting eco-innovation without having economic benefits in return (DiMaggio and Powell, 1983; Berrone et. al. 2010). Thus, studies on institutional theory are explaining the changes within an organisation due to different driving factors. Public organisations use coercive pressure in form of environmental policies, laws, and regulations to promote eco-innovation (Aguilera et. al., 2007; Doran and Ryan, 2012). Contrary to that normative and cognitive pillars use indirect means to establish the importance of regulations for companies.

There are some disadvantages attached to this theory as well. According to Greenwood et., al. (2014) institutional theory cannot differentiate between different organisations easily. He

criticises the theory on its generalisation aspect for different types of organisations. Because it ignores the heterogeneity between different organisations sometimes can create a bias in the study. Another criticism is based on the strength of the pressure how much pressure any pillar can put on a company? So, the studies evaluating only external driving factors of eco-innovation can use this institutional theory. But the studies evaluating the internal firm capabilities used as internal strength of the firm to fight against external pressures cannot use this theory as a theoretical base for the study.

This research is using external influencing factors or drivers for the adoption of eco-innovation in packaging, but it is also using internal capabilities as a strength to adopt eco-innovation as a response to that pressure. Additionally, it is a multiple case studies research and the four firms used in this study are different from each other. They are not homogeneous based on their innovation adoption experience and size. Institutional theory can create a bias in this aspect therefore, it is not the best theory for this research.

3.1.2 Stakeholder Theory

According to Freeman and Reed, (1983 p. 91). A stakeholder is a term that is used for the individuals or groups of people who are affected by firms' objectives or can affect the firm. Many other theories on stakeholders describe firm accountabilities toward its stakeholders but the stakeholders' theory emphasizes the importance of stakeholders and their needs as a responsibility of the firm to fulfil them (Banerjee, 2002). These stakeholders focus on the social objectives and responsibilities of a firm objective. Therefore, the stakeholders' theory appraises the social responsibilities of a firm based on its societal views and social performance (Clarkson, 1995). It leads a firm towards better social performance as stakeholders' perspective is used for better social and organisational performance.

Researcher is considering the stakeholders theory for the eco-innovation in packaging for the food and drink industry. As packaging waste and eco-packaging is very new area of knowledge therefore, the literature on eco-packaging for waste prevention is very fragmented. To add into the existing literature, facilitate study literature review and to give base to this research stakeholders are used as important drivers for eco-packaging adoption. According to Freeman, (2010) Stakeholders are the person who are affected by or can affect the firm activities. Stakeholders' theory is based on corporate social responsibility that emphasis on businesses to be the servant of the society and making stakeholders happy is not their only duty (Schnepf and Bowen, 1954).

According to the stakeholder's theory, a successful business is not that just thought about keeping its shareholders happy, but it keeps stakeholders satisfied and gives importance to all stakeholders (Benn et al. 2009). If a manager understands the importance of stakeholders and firm responsibilities toward them, the business will be successful to achieve its social and economic objectives (Donaldson and Preston, 1995). It helps managers to solve business matters with stakeholders easily by adding value and trading social and ethical relationships with stakeholders (Freeman et. al., 2010). Similarly, Weiss, (1995) claims that the stakeholders' theory emphasis the company to serve stakeholders' demands sincerely as they can damage or harm the company if their demands are not fulfilled by the company.

If they are happy with the company as it is serving them well, they can benefit from it. Much green marketing, environmental management, environmental strategies, and environmental innovation-related studies used stakeholders' perspectives to explain stakeholders as important drivers for the company's efforts toward the environment (Garrod 1997; Henriques and Sadowsky 1999; Rivera-Camino 2007; Horisch et al. 2014). This theoretical applicability of the stakeholders' theory in eco-innovation research clarifies a variety of aspects and stakeholders as motivating forces for the company's moral actions and decisions connected to environmental advantages. So, stakeholders theory revolves around stakeholders, their importance to the company, and their impact on the company's decision-making process.

According to Jones and Wicks, (1999) the definition of stakeholder theory can cover many aspects and can comes under the scope of different types of research. But a researcher can use this theory based on his cases selection and explaining the theory based on his own study scope. The next section us explaining the application of stakeholder's theory based on this research stakeholders.

According to Thom, (2018) many multinational companies (coca cola, tetra pack, Unilever) are aiming to sustainability and for that those companies are using packaging recycling and packaging waste collection as their most important sustainability strategy. Although, companies are claiming that they are suing strategies to fulfil their waste management responsibility but still food and drink packaging waste is a big problem of the economy (Discussed in chapter 1).

Strategies that are related to waste prevention and eco-innovation in packaging are closely linked to the concepts defined in existed literature as green supply chain, sustainable supply chain management, close loop strategies and environmental management (Meherishi, et. al.,

2019). All these concepts are providing support for packaging supply chain management and are adding close loop/ circular flow of packaging materials around supply chain. Some recent studies address the close loop strategy and circular economy practices in the whole supply chain. But packaging is always a small percentage of discussion in all these studies and is not investigated deeply (Wang, et, al., 2016). In all these previous studies packaging waste prevention, sustainable packaging and eco-friendly packaging are the concept discussed at strategic level and some remaining perceptions are debated based on packaging design, production process and waste treatment. In simple words, the literature on eco-packaging is shattered and instead of discussed solely, it has become a part of other research topics.

It is very important to specify the concept of eco-packaging for waste reduction and stakeholders used in this research in advance. Industrial system has two different types of processes that are termed as restorative and regenerative (The Ellen MacArthur Foundation MacArthur, 2017). According to (The Ellen MacArthur Foundation MacArthur, 2016) restorative system has “*Ability of end-of-life products/materials to become technical nutrients through repair, refurbishing, remanufacturing, and recycling*”. Similarly regenerative system has “*Ability of end-of-life products/materials to become biological nutrients and become part of the biosphere as natural capital for reuse*”. This research is using eco-packaging aiming at keeping alternative eco-friendly materials in focus to reduce plastic packaging and using restoration and regeneration process at its highest level for waste prevention.

Additionally, waste prevention strategies also encourage zero plastic use or waste. This is termed as circular economy concept or circular supply chain management. The difference between linear supply chain and close loop supply chain management is that in linear supply chain all packaging (generated by different stages) becomes a part of landfill and in close loop supply chain packaging waste is recycled and reusable materials are recovered, remanufactures, renewed, and reused (Van Wassenhove, 2006; Moula, Sorvari and Oinas, 2017). Each stage of the circular supply chain system recycles, refurbish, renew, recover, reuse, remanufacture and retain the packaging material (Pan et. al., 2015; Genovese et. al., 2017; Geissdoerfer, Vladimirova and Evans, 2018). Following image is comparing Comparison of linear, closed loop, and circular supply chain networks (Farooque et al., 2019).

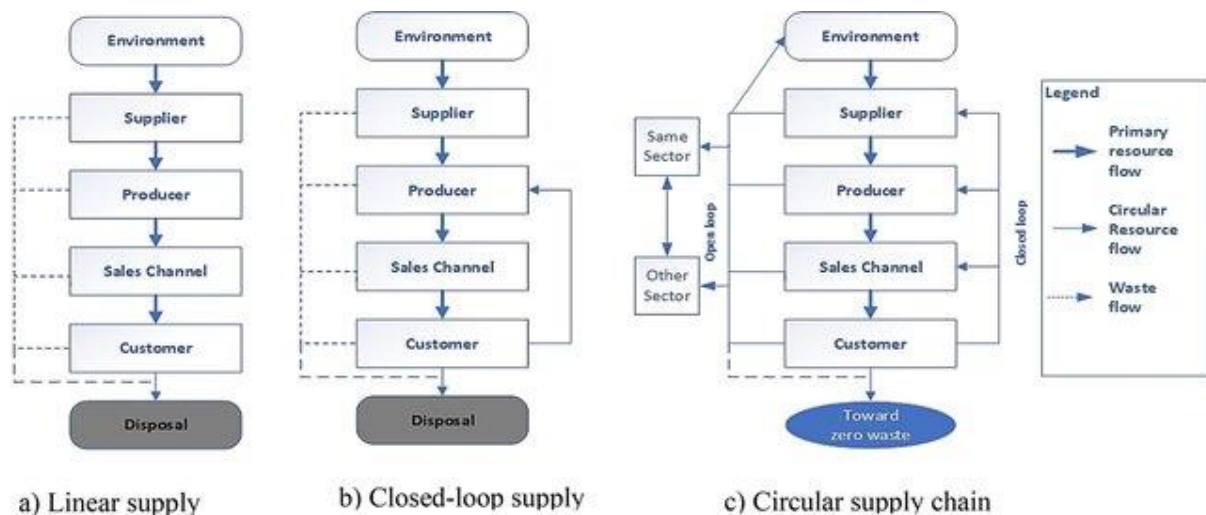


Figure: Comparison of linear, closed loop, and circular supply chain networks (Farooque et al., 2019)

If we combine Verghese and Lewis (2007) supply chain process with circular economy supply chain management process it makes circular packaging supply chain.

In this research stakeholders that are important for the adoption of eco-packaging for the food and drink companies are consumers, government (regulations), brand competitors, employees, and company managers. These stakeholders have big impact on the adoption eco-friendly packaging materials to replace plastic packaging from the packaging supply chain.

3.1.3 Ecological Modernization Theory (EMT)

Huber introduced ecological modernisation theory in 1982. In his theory, he introduced the word “ecological switchover” to transform the industrial word into an ecological word to escape from an ecological emergency. He introduced a new relationship between ecology and economy via his theory. In simple words, ecological modernisation theory can help to establish a connection between the production process, environment, consumption, institutions, and people living in a society. This theory, therefore, explains industrial nations how can protect their environment through environmental innovations (Murphy and Gouldson 2000).

According to ecological modernisation theory, ecological problems created by industries can be solved by incessant and constant technical and social reforms and by introducing policies to implement these reforms in society (Gouldson and Murphy, 1997; Mol and Sonnenfeld, 2000; Mol, 2001). Ecological modernisation theory has two basic proposals. The first economic sphere cannot add the environment as subordinate to it. It means they both have their independent domains and can have equal significance (Mol, 1996). Second, Environmental

activities have become a movement in politics. As political forces are using it as their mainstream agenda.

EMT explains that capitalism can be retained as a production and consumption system by efficient use of natural resources and gaining sustainability by using environmental innovation. Thus, environmental problems can be an opportunity for the capitalist industries. EMT also proposed that manufacturers can use clean ecological technologies to overcome the problems of old technologies. It will also help them to remove the obstacles related to technology adoption. These manufacturers just need to change their organisational structure to adopt ecological changes and find opportunities in new environmental technologies (Murphy and Gouldson, 2000).

According to Porter and van der Linde, (1995), eco-innovation can help companies to increase their profit and gain a competitive advantage by efficient use of resources and by adding value to the company. So, for better results, ecological modernisation should be linked with recycling, renewable and renewable resources, and clean technologies. Sonnenfeld, (2000) explains the short-term and long-term goals of ecological modernisation. A short-term goal is to introduce waste prevention, reuse and renew resources, eliminate the environmental impact of production through clean technology, and use environment-friendly materials. Similarly, the long-term goal is to clean the whole production process and resource preservation. Gouldson and Murphy, (1997) proposed the main objective of ecological modernisation as a reduction in the environmental damages per unit of production and thus increase the production efficiency.

According to Mol and Sonnenfeld, (2000) ecological modernisation studies are based on five themes.

1. Considering the role of technology as not only the contributor to ecological problems but at the same time can provide solutions for the crisis created by these ecological problems.
2. The responsibility of economic agents and the market situation on the adoption of these ecological changes and the economy reforming process.
3. Introducing change in the government and their command-and-control instruments for environmental changes. Introduction of decentralised and malleable reforms.
4. Involvement of private and public organisations during the environmental reforms and policy-making process. In which roles are changed for the better environmental policies and their implementations.

5. Use of new emerging ecological technologies, ecological designs, and ecological materials during the production process to decrease the environmental impact of firms.

Similarly, Gouldson and Murphy, (1996) also identified three steps as changes to adopt ecological strategies.

1. Inclusion of ecological objectives in the production and consumption of social actors. This process will lead to the development and introduction of clean technologies along with the advantage of efficient use of resources and fewer emissions to the environment (Gibbs, 1998).
2. Adding environmental policies into firm business strategies or in industrial reforms.
3. A structured system of environmental policies, fees, and tax reforms by incorporating economic value into them.

The main aim of the ecological modernisation process within a business is to provide financial benefits to the company from pollution reduction, waste management, and recycling. A cleaner production process will help a company to reduce the costs related to environmental fees and taxes. As companies must pay for environmental damages, cleaning up contaminations, proper waste disposal, and, CO₂ emissions (Dryzek 1998). As different studies used ecological modernisation by using different definitions for it, therefore, the concept of EMT is new for every research.

Ecological or environmental innovation is the base for ecological modernisation theory. Technological changes in the firm in terms of technological innovation are the main driving force for innovation in production and consumption by keeping ecological importance in mind (Gouldson and Murphy, 1998; Mol and Sonnenfeld, 2000; Murphy and Gouldson, 2000). Most studies on environmental innovation are focused on introducing change in the polluting industries in terms of eco-innovation for efficient use of resources and reduction in cost.

Murphy and Gouldson, (2000) divide innovation into two types radical and incremental innovation. Radical innovation is about intermittent change i.e., introducing new eco-technologies or processes. On the other hand, incremental innovation is about continuous change in the technology or process or introducing ecological changes in the existed technology. He also added that incremental changes can become radical innovations after getting success. Additionally, radical innovation also requires a change in the other parts of the production process as a requirement for the system and it may be a bit more costly for the company to adopt it easily. Therefore, companies often prefer incremental innovation to radical change (Murphy and Gouldson, 2000).

As ecological modernisation theory is used for many environmental innovations and eco-innovation studies, therefore, it is justifiable to say that we can use it to get knowledge regarding the adoption of eco-innovation in packaging based on the eco-technological capabilities, recycling, reusability of materials, and getting an advantage in terms of waste prevention.

Ecological modernisation theory is used to introduce eco-innovation in packaging as according to this theory environmental problems can be overcome by introducing ecological innovation, technological innovation, and environmental solutions through public and private policies and prevention. This theory has gained support from different types of eco-innovations, pollution prevention strategies, and life cycle assessment policies (Spaargaren and Vliet, 2000). EMT supports technological innovation and environmental regulations for redesigning from an ecological perspective and sustainable supply chain management (Zhu. et. al., 2012). Technological innovation and environmental regulations by government are considered as essential driving forces for the adoption of eco-packaging by food and drink companies.

Eco-innovation is about the efficient use of natural resources, and this is named as “eco-efficiency paradigm” (World Business Council for Sustainable Development, 2000; Kemp and Andersen, 2004; Franceschini and Pansera, 2015). Eco-efficiency is also termed ecological modernisation (Mol and Spaargaren, 2000; Jänicke, 2008). Therefore, ecological modernisation theory is considered an eco-innovation theory. It is concerned with the use of clean technologies for environmental protection, micro-level business benefits, and economic development (Murphy and Gouldson, 2000; Zhu et. al., 2012). It is also providing guidelines for management innovation and strategic business changes from the perspective of environmental preference.

Eco-innovation also helps companies to maintain competitiveness through technological innovation, invention, diffusion of information, innovation, and adoption of modern techniques (Zhu et. al., 2012; Huang, 2018). While a company is drafting an eco-innovation strategy, it also invests in green resources for green processes and tries to use all required green resources and changes for eco-innovation. These green strategies and resources help companies to overcome regulatory and other pressures and achieve new market positioning.

According to (Li and Ye, 2011) public environmental regulations and competitive pressure have a big impact on the adoption of green practices by the firm that resultantly help companies to improve their environmental performance. another study on 137 countries by (Wang et. al., 2019) proves that international laws and internal regulations help to reduce emissions along

with helping developing countries to reduce emissions. Hence, ecological modernisation theory is used in the literature for achieving green objectives through technological innovation for coping with the pressure from public organisations and other market drivers.

This research is using ecological modernisation theory to explain how packaging is evolved by replacing plastic with eco-friendly materials and how different features of eco-packaging are helping waste prevention. Companies are reacting to packaging waste related to environmental regulations and other pressures by building technological and other eco-capabilities for eco-packaging adoption. This will not only help a company to stay competitive in the market but also help to achieve a green brand image and waste management.

3.1.4 Circular Economy

The Circular Economy concept is a tool that helps companies to reduce or eradicate their harmful activities (Ghisellini et al., 2016; Loiseau et al., 2016; Winans et al., 2017; Geissdoerfer et al., 2017; Kirchherr et al., 2017). It provides a close-loop strategic system to the production companies for the prevention of their waste, efficient use of energy resources, and reduction in raw materials (European Environment Agency, 2016; Stahel, 2016). For the last few decades, this concept is a part of public policies (The Standing Committee of the National People's Congress China, 2008; EC, 2017). It has also been used for waste management-related policies, responsible production, and consumption around the world (Ghisellini et. al., 2016).

The circular economy concept is giving importance to the use of clean technologies, clean energies, and reusing waste for many purposes (Geissdoerfer et. al., 2017). Waste reduction uses the principles of recycling, reduction, and reuse (Wu and Deng, 2013; Jawahir and Bradley, 2016; Sehnem et al., 2019). It encourages the introduction of sustainable practices in the business to achieve the circular economy objective (Tura et. al., 2019). Now this concept has become very common for regulatory authorities, business representatives, and policymakers (Sehnem and Pereira, 2019). It provides many advantages to a business including a reduction in environmental costs by reducing its environmental impact (Linder and Williander, 2015). Thus, it helps companies to find solutions and respond to the environmental impacts of the company (Tura et al., 2019).

According to the European Environment Agency, (2016) report, the circular economy concept encourages the use of life cycle assessment, extending product life cycle, eco-designs, and waste prevention strategies. Similarly, Ghisellini et. al., (2016) introduce reuse, recycling, and

reduction as three basic principles for waste management. The reduction rule works on less use of energy resources, and raw materials, and less production of waste. The reuse principle is based on reusing a product or its components for any other purpose to not include them in waste. Recycling is about processing materials, waste, energy, water, and other resources for reuse. Reuse and reduction are considered green or environmental options (Allwood, 2014). Whereas recycling is considered a cost-efficient solution for the company (Grosso et al., 2017). This new circular economy model is now challenging the already existing business models based on its importance for the future (Lewandowski, 2016; Sehnem et al., 2019; Bocken and Short, 2020). Additionally, the circular economy concept is gaining popularity among different stakeholders including customers, suppliers, public authorities, and research institutions (Zucchella and Previtali, 2019). The circular economy concept is giving importance to the company managers and their views as they must create an environment in the company for better adoption of circular economy practices e (Ghisellini et. al., 2016).

For packaging, waste management reuse and recycling are two main tools that can be used to get economic and environmental benefits by the company (EC, 2015). But the problem here is that only specific packaging materials can recycle including glass and metals. Materials that do not change their chemical properties during the solid to liquid phase can be reused again after recycling (Conte et al., 2014). Some packaging material changes their chemical structure during recycling therefore, they have restricted recyclability i.e., paper, cardboard, and thermoplastics. Some have very complicated process of recycling e.g., thermoset plastic. some are easily renewable and recyclable materials that are best for the circular economy perspective (Conte et al., 2014; Grosso et al., 2017).

The “R” principles are linked with the circular economy studies to highlight the importance of reduction, recycling, and reusability (Reike et. al., 2018). Some other studies mentioned “6R” values for the circular economy these are Reduce, reuse, redesign, recycle, renew, recover, and remanufacture (Zhang et. al., 2013; Govindan and Hasanagic, 2018; Bradley et. al., 2018).

There are different rules and regulations for food packaging in different developed countries around the world. These rules asked companies for necessary precautions while using recycled packaging materials in food products packaging so that chemicals from recycled materials should not migrate into food items (Muncke et. al., 2017). European countries are using Plastics Recycling Regulation for products that are using recycled plastics as packaging material (EC 282/2008). Similarly, in US Food and Drug Administration of the United States (US

FDA) regulate packaging manufacturing companies by keeping a close eye on the plastic recycling process and reuse of the recycled materials as food packaging (US FDA, 2006). Recycled paper and cardboard packaging are regulated in the 21 CFR 176.260 act in the US. There are rules for the waste papers that are recycled that they should not contain any poisonous substance that can be transferred into the food. There are many measures introduced specifically for recycled paper and board packaging (Simoneau et al., 2016).

This research is using eco-innovation in packaging concepts based on a circular economy model for waste prevention. As the main objective of a circular economy system is to design an economy in such a way that there is less use of natural resources or if possible separate economic activities from natural resources and eliminate the waste in the system. Based on the concept of the circular economy model, this study is evaluating the adoption of eco-friendly packaging materials by food and drink companies for waste prevention. The proposed framework integrates different external drivers and internal eco-capabilities of the firm for waste management and a better brand image.

3.2 Conceptual Framework Applying Stakeholders theory, Ecological Modernisation theory and Circular Economy model.

To understand the various factors that influence the adoption of eco-packaging innovations for waste prevention and a green image, including managerial environmental concern and firm eco-capabilities, a comprehensive theory that makes it possible functionality for the integration of eco-packaging innovation approaches is necessary. This study considers ecological modernisation theory and circular economy model as theoretical base for research framework. These theoretical models will support the research objective and plans. The goal of this section is to create a theoretical foundation that can explain how eco-packaging innovation has been adopted and how it has affected the UK food and drink industry.

This research is conducted to assess the eco-packaging innovation in terms of food and drink industry. It is also conducted to evaluate the extent of awareness, knowledge, and adoption that exists in the UK food and drink sector for eco-packaging as a waste management practice. Based on the study rationale the following research questions are set for the study:

5. How do external driving factors affect the eco-packaging innovation for the environment and waste prevention by the food and drink industry?

6. How do managerial environmental concerns link with the eco-packaging innovation for the environment and waste prevention by the food and drink industry?
7. How do Eco-capabilities affect the eco-packaging innovation for the environment and waste prevention by the food and drink industry?
8. How does eco-packaging innovation is helping to prevent waste and affect the green image of the company?

To meet the above objectives, key elements of ecological modernisation theory (Knowledge, innovation, clean technologies, government regulations), stakeholders' theory (customers, government, competitors, employees) and the circular economy model (5R's, Share, Waste prevention, optimisation) are applied to the research framework. There are some other elements included in the framework as driving factors for eco-packaging innovation.

The food and drink sector are contributor of a huge amount of packaging waste therefore, this sector needs to consider alternative packaging materials that can have reusability and recyclability features. Additionally, waste can also be used for energy recovery to use in production processes (Ortiz *et. al.*, 2019). So, the circular economy model helps companies to convert waste into energy by using thermochemical adaptation and other processes (Ortiz *et. al.*, 2019).

Environmental problems are associated with packaging waste treatment therefore, ecological modernisation theory can be used as a solution to these problems through cleaner technologies and eco-innovation adoption (Weber and Weber, 2020). This theory suggests the government institutionalises the production and consumption process by considering the importance of the environment. Clean technologies or technological innovations are also essential elements in EMT (Lazarotti *et. al.*, 2020) The key concepts of the framework concerning the EMT are discussed below:

UK food and drink firm Characteristics:

The research defines its scope and particular focus using components related to ecological modernization and circular economy principles. This is significant since the study is focused on the adoption of a particular market, the food and beverage business, a specific group that has previously embraced eco-packaging for products, somewhere in a specific country, the UK. The respondents are the company managerial level employees who have more than 5 years of working experience within the company. In chapter six of this study, the findings are provided together with the features of the respondent's profile.

Motivators to eco-innovation adoption: The main drivers for corporate adoption of eco-innovation are identified using the existing eco-innovation literature. The study makes use of external driver factors. Managerial environmental concern, eco-capabilities as components of eco-innovations, and an effort to emphasise the significant drivers behind the case firms' adoption of eco-packaging.

Eco-innovation adoption process: Following the identification of the respondents' perceived drivers of eco-adoption through the ascribed variables affecting adoption, they are then motivated to either accept or decline the eco-innovation depending on the most important factor. The research tries to determine how and why the eco-innovations are adopted if motivated to adopt and the choice to adopt is verified. This is confirmed by knowing areas inside which the business has completely integrated various forms of eco-innovation embraced.

The study is looking to see whether there is any additional motivating or supporting elements connected to the innovation adopted from the respondents' experiences and adoption, or in some cases, what outcomes and advantages the respondents identify with the adoption of particular eco-packaging innovations. The response will also draw attention to the ways in which the eco-innovations in packaging that they have embraced have been proven via acknowledgement of the application and confirmation phases of the adoption process.

This is not practical for short-term research and significantly depends on the participant's ability to recall the many phases involved with the eco-innovation choice process, such as when they initially learned about the innovation and made the decision to adopt it. Because there may be a gap between these two points that may have been difficult for some responders to recall, this study opted not to account for this element. However, this was changed, allowing the study to develop characteristics of eco-packaging depending on the variety of eco-innovations embraced by each respondent within the survey, by removing the time aspect from innovativeness and focusing solely on adoption.

The key concepts of the framework concerning the ecological modernisation theory (EMT) are discussed below:

Government regulations

Ecological modernisation theory (EMT) focuses on government regulations and environmental policies as major determinants of environmental strategies and eco-innovation adopted by companies. Environmental regulations are considered external driving factors along with

customer demand and competitive pressure within the research framework. Public policymakers are also creating awareness among consumers of the importance of green practices; therefore, these government regulations are also creating consumer demand. Similarly, these environmental regulations are creating advantages for the companies who are adopting environmental practices in the first place within an industry. The first mover advantage also creates competitive pressure for other companies within an industry.

The UK as a developed country has policies for packaging waste. The ambition of the country is to make all packaging recyclable, compostable, and reusable before 2025. It also includes a strategy for zero waste before 2050 with the eradication of plastic packaging before 2042. In the UK companies must pay for the collection, recycling, and disposal of waste in form of taxes and fees.

Knowledge

Ecological modernisation theory (EMT) considered the importance of technical knowledge and new technology for cleaner production processes. Thus, modern scientific knowledge through research is a central part of the EMT. This knowledge should also be distributed among employees but also can be shared through collaboration. From this element perspective, this study is considering the integration of the importance of managerial knowledge as a facilitator of the eco-packaging adoption process. Managerial knowledge regarding EMT helps him to understand the importance of green technologies for eco-innovation.

Knowledge as an element of EMT, in the research framework, represents managerial environmental awareness, research and development, and building of human capabilities by employees training and sharing the knowledge of eco-innovation with them. The employees also need to be trained for using new technologies adopted for eco-innovation. Employees' confidence in the company's environmental policies and decisions with help to create employee loyalty, retention, and successful adoption of eco-packaging.

Clean technologies

Ecological modernisation theory (EMT) considers technological innovation in form of clean technologies and prevention as a solution to environmental problems. This perspective of EMT is supported by eco-innovation. In this study framework, this element of EMT is added as technological capabilities, where firms are introducing new eco-technologies for the adoption of eco-packaging. These technologies are helping companies to reduce their emissions and

waste. Some other types of new technologies are adopted to treat this production process waste to regenerate energy to reuse it in the production process. These clean technologies also help companies to deal with the eco-materials needed for new packaging.

Innovation

Innovation is termed eco-innovation in the research framework. This innovation as an element of EMT helps companies for cleaner production processes with fewer emissions and less waste generation. This technological innovation can help companies to improve their operational and environmental performance. In this research framework, technological capabilities are also based on innovation along with the introduction of environmental innovation in the packaging. Technological innovation is a strategic element of EMT that is helping companies in eco-packaging adaptation.

The elements of the circular economy model concerning the research framework are discussed below:

5R's

The 5Rs introduced in the circular economy model are Reduce, reuse, recycle, refurbish, and repair. These 5Rs are helping companies to respond to costs linked to waste management and other environmental challenges. These 5R's are linked to eco-packaging to make it more eco-friendly as these features reduce packaging waste by closing the production cycle, renewable energy and resources, and eco-efficiency. Additionally, these 5R's also help in packaging waste prevention that is added to the framework as an outcome of eco-packaging adoption.

Waste prevention

The circular economy concept is based on the concept of replacing the end-of-life phase to reduce waste. On the other hand, it is encouraging recycling and reusing materials for waste management and sustainable development. The R principles of the circular economy model are also used for eco-innovation in packaging to reduce packaging waste and efficient use of natural resources by the company. This element of the circular economy model is an outcome in the framework of this study, gained from the adoption of eco-packaging.

Optimisation

The circular economy concept is based on resource optimisation by innovation collaboration and using waste as a resource to regenerate energy. Technological advancement is also helping companies for optimisation the use of different resources. In this research, framework optimisation refers to the efficient use of energy and water resource by reusing them in the production process. it is also linked to the use of new technology innovation as a source of renewable energy and other resources and eliminates the environmental impact of the production activity.

Green marketing green marketing is supported by the channels of communication, is documented in the study as a green image, green advertising, and green publicity, and is employed to investigate the possibilities of green awareness, leading to pretend acceptance without real implementation in practise. In this study, "green marketing" refers to how companies promote their environmental initiatives.

3.5. Summary

This chapter listed four theories that may be used in the study, including the circular economy model, stakeholder theory, institutional theory, and ecological modernization theory. The literature has been studied for their applicability, benefits, and drawbacks, and as a result, the ecological modernization theory (EMT) and circular economy model (CE) have emerged as the theories most suited for all this study. The integration of these two concepts into the study framework contributes to the understanding of how firms implement eco-innovations in packaging. In the methods listed below, this hypothesis contributes to the goals of the study.

The types of eco-innovation considered in this study are just those that pertain to eco-packaging. To lessen the harmful environmental effect caused by their food and drink packaging, the food and drink industry will undoubtedly implement a variety of green concepts, methods, and activities. The circular economy concept is therefore helpful in understanding the eco-packaging technologies used throughout the UK food and drink industry.

The spread of ecological modernisation theory (EMT) and circular economy model (CE) are well-developed theories, broadly accepted for the solution of environmental problems. This research is using the themes of both these theories to develop a study framework.

CHAPTER 4

RESEARCH PROPOSITIONS

4.1 External drivers

Three primary external factors, which have a significant impact on the implementation of eco-innovation, are outlined in the literature review. These drivers are competitive pressure, customer green demand, and environmental regulations. These drivers are discussed as sub-section in this section and related propositions are later presented in these sub-sections.

4.1.1 Competitive Pressure for the Environment and Waste Preventing Eco-innovation.

Competitive pressure helps a firm to gain an advantage in form of success after reacting to the competitors' activities (Chen, 2008). Keeping yourself up to date with your rivals' strategies and actions is very important to stay in the market (Narver and Slater, 1990). Eco-innovation is linked with ambiguous and risky effects therefore, keeping an eye on competitors' eco-innovation help companies to get an advantage from the result gained by the other company or they can bring more innovative idea than the rivals in the market (Dai et. al., 2015). It is also possible that one company will copy the other company's eco-innovation same way to at least get the same kind of success in the market (Liu et. al., 2010). In this way, a firm may show the impact of the competition and try to overcome that impact by adopting green innovation (Berrone et. al., 2013). As a result, pressure from competitors is seen as a key factor in the adoption of eco-innovation.

Competitor companies put pressure on businesses to innovate more by creating new products, technologies, and equipment (Clark, 2005). As a result, enterprises are subject to external competitive pressures. By creating energy-efficient goods and solutions as well as renewable energy, Siemens, a German industrial conglomerate. For instance, assumes a leadership position in sectors that use a lot of energy. Due to intense competition, several businesses copy Siemens' eco-innovation strategies to project a positive image and increase their market share (Li and Ye, 2011). As a result, the increasing need for eco-innovation capabilities is being driven in part by external competitive pressures that demand higher environmental as well as product quality (Hicks and Dietmar, 2007).

Research has already been done that demonstrates the beneficial effects of competition on environmentally friendly or green activities (Sarkis, et. al., 2011; Hofer et. al., 2012; Dai et. al., 2015). Similarly, Hofer, et. al., (2012) find that The competitive pressure that businesses create via their environmental plans and environmental management systems (EMS) is strongly attributable to the environmental actions of other businesses. The adoption of eco-innovation by rivals influences a company's green innovation as well (Dai et. al., 2015). These above-discussed observations are suggesting the following propositions:

Proposition 1a. *Competitive pressure is associated with the adoption of eco-packaging innovation.*

4.1.2 Customers' Demand for Environment and Waste Preventing Eco-innovation.

Customers' environmental demands may also be the driving force for businesses' adoption of eco-innovation. Suppliers must comply with these requirements to enhance their environmental and social performance and implement pro-active eco-innovation strategies. Additionally, corporate clients could want manufacturers to submit documentation proving that they adhere to all environmental quality requirements. We may thus anticipate that such demands will positively encourage eco-innovation (Handfield et al., 2002). Demand from consumers is a major factor behind green innovation (Huang et. al., 2016).

Customers' environmental concerns and responsible buying behaviour are becoming a key driving force for green innovation (Lieb and Lieb, 2010; Wolf and Seuring, 2010; Rossi et.al., 2013). For example, the pressure manufacturers are facing from consumers who are becoming more concerned about the environment is pushing businesses to adapt their logistical methods to be more environmentally friendly (Gonzalez-Benito and Gonzalez-Benito, 2006). Customer demand and pressure arise from their expectations of a manufacturing firm to have environmental requirements and solve environmental problems related to them (Lin and Ho, 2011).

The institutional theory also proves that green innovation is derived by a firm after customers' demand, for the environmental management system. Customers' demand is a source of green supply chain management practices by many companies these days (Zhu et. al., 2005; Gonzalez-Benito and Gonzalez-Benito, 2006; Sarkis et. al., 2010, Jack et. al., 2010; Zhu et. al., 2005). These companies are reacting to the customer's demand by introducing different types of eco-innovations. Another study by Jack et. al., (2010) highlights the fact that because of customers demand and pressure companies are showing innovation and environmental

practices. if customer demand is not existing in the market there are chances that companies never introduce eco-innovation. Based on all studies discussed above, the following proposition is proposed:

Proposition 1b. *Customer demand is encouraging the adoption of eco-packaging innovation.*

4.1.3 Environmental Regulations for Environment and Waste Preventing Eco-innovation.

Li and Ye (2011) claim that customers' expectations for green products, environmental legislation, and market pressures are some examples of external drivers for eco-innovation. Environmental restrictions are one of the key drivers of eco-innovation since most environmental problems have negative external repercussions and are thus less internally motivated than other innovations. According to the well-known Porter hypothesis (Porter and Van der Linde, 1995), environmental standards may provide regulated businesses greater benefits, which might eventually result in higher profitability. According to empirical studies, stricter environmental regulations encourage eco-innovation by lowering production costs associated with complying with environmental regulations (Cleff and Rennings, 1999, Frondel et al., 2007, Kammerer, 2009).

According to the institutional theory, institutional pressure can use stakeholders as a medium to force firms to adopt environmental policies and eco-innovation by reallocation of their resources (Berrone et. al., 2013). Regulations such as eco-taxes are restricting firms to introduce packaging innovation to increase the recyclability of packaging and decrease waste with less packaging material (Deweese and Hare, 1998). The most significant legislative tool based on the "*polluter pay*" idea is extended producer responsibility for packaging, which forces businesses to contribute financially to minimise packaging waste and environmental consequences based on their packaging (Fernie and Hart, 2001; Roine and Chin-Yu, 2006 and, Mayers and Butler, 2013). Extended producer responsibility for packaging is based on the packaging weight therefore it helps to bring change in the packaging at the source (Afif et. al., 2021).

Environmental regulations are an active part of environment-friendly packaging introduction and packaging sustainability (Qing and Guirong, 2012; Nguyen et. al., 2020). Some of the packaging regulation laws are municipal governments for the collection and storage of recyclable waste separately (Nakatani et. al., 2020). These municipal regulations also enable companies to think about the change in packaging material as an environmentally responsible producer to introduce most of their packaging as recyclable. Numerous studies have found a

link between regulations and the long-term effectiveness of food packaging. The main features highlighted for this packaging innovation are compostable, biodegradable, recyclable, renewable, and environment friendly to spread less environmental pollution (Siracus, et. al., 2008; Goffin et al., 2011; Peelman et al., 2013; Lic-ciardello, 2017; Narayanan et. al., 2017). After all discussion about environmental regulations and packaging innovation (sustainable packaging, eco-friendly packaging, eco-packaging), the following proposition is proposed:

Proposition 1c. Environmental Regulations foster the adoption of eco-packaging innovation.

4.2 Managerial Environmental Awareness for Waste Preventing Eco-innovation.

Organisation learning theory is that any firm can learn and progress from its internal capabilities and knowledge by spreading it inside in a well-managed way. In the same manner, managers may get knowledge from their previous choices and attitudes toward the company's future business strategies (Cohen & Levinthal, 1990). Simply put, organisational learning theory describes why a business learns from judgments made in the past by management and senior leaders and integrates this knowledge into all the company's activities (Levitt & March 1988). The successful deployment of eco-innovation associated with leadership support. Innovation in eco-packaging may be justified using the same justification.

Eco-innovation is an essential aspect of becoming green for sustainability by giving direction and complete knowledge to the firm towards green trends (Chiou et. al., 2012). When creating a new, innovative product or service, green innovation takes the shape of green product design innovation. This includes integrating less energy and generating less waste during production (Chen, 2018). The organisation will be more inclined to introduce innovation if managers support it (Ho et. al., 2009). Like this, the more the management supports green innovation, the more effective and successful any type of sustainability development will be for the company (Mohd Saudi et. al., 2019). The promotion of any environmental practises and the improvement in the efficacy of eco-innovation are both dependent on management environmental care. It will lead to the company's competitiveness and the attainment of environmental goals (Qi et. al., 2010).

Muinat and Adebola, (2018) in their study on Taiwan support the fact that a company's environmental culture directly influences its green learnings and performance. Found the positive relationship between green product development on the company's environmental performance. Green innovation, management environmental concerns, and business

performance were all linked in the same study (Ar, 2012). Similarly, Tang et al. (2018) demonstrates through their research on Chinese enterprises that management environmental concern moderates the association among both green process innovation and company success. According to Lin and Ho's (2008) study, managerial support is a major factor in the adoption of eco/green practises that are connected to the environment. Standards, values, and organisational management attitude also have an impact on a company's propensity to implement eco-innovation (Jansson et. al., 2010). Like this, Lin and Chang (2009) note the beneficial influence corporate environmental integrities have on green innovation and environmental learning. Qui et. al. (2010) also discovered that management care for the environment at work is a driver of the firm's adoption of eco-innovations. Based on the research mentioned above, we may conclude that management environmental awareness directly influences packaging eco-innovation.

4.2.1 Managerial Risk Awareness and Waste Preventing Eco-innovation.

Managerial environmental awareness can be divided into managers' environmental risk awareness and its cost-benefit analysis for the solution they can adopt for environmental risk. Risk awareness refers to the degree to which a manager knows about the firm's negative corporate impact on the environment, which reflects administrative ecological profound quality/morals. Cost-benefit analysis alludes to managers' knowledge of the potential cost of investment funds as well as benefit increment coming about because of better ecological practices, which mirrors the benefit of looking for inspiration. In the first place, we contend that managers with higher ecological mindfulness give more consideration to environmental issues or issues in the business. In other words, ecological issues are bound to be seen by officials with more grounded natural mindfulness.

Contrasted and general developments, eco-advancement needs progressively management duty and consideration due to its double positive externality attributes s (Ramus and Steger, 2000). According to (Gadenne et. al., 2009) management with higher risk awareness will give significantly more consideration to the unfavorable impacts that their firm has on the indigenous habitat and to ecological issues in the business. He will likewise be progressively learned about how ecological guidelines or laws influence the firm and what best natural practices exist in the business. In this way, managers with higher environmental chance mindfulness are bound to concentrate on eco-advancement with higher ecological execution, and consequently are bound to present assembling forms, improve existing items, or acquaint

new items with diminishing their natural effect. Interestingly, officials with a more grounded cost-benefit analysis will give more consideration to the financial returns and potential business openings (e.g., green market) of natural insurance and contamination aversion. Along these lines, they will in general spotlight on improving their company's current items or presenting new items that catch these open doors because of their characteristics, for example, higher permeability, a shorter compensation period contrasted and interest in procedures, and methods for catching worth (basically through item market trade).

Second, we believe that managers that have a greater ecological consciousness may be more proactive in their interpretation of natural challenges and see them as opportunities rather than threats. Managerial elucidation of ecological issues altogether influences corporate natural methodologies. We accept that officials with more grounded ecological mindfulness might be proactive in their understanding of natural issues in two regards (Sharma, 2000). The more grounded an official's risk awareness, the higher his view of ecological institutional weights from outer striking partners. That is environmental risk knowledge that can improve a manager's impression of the significance of ecological assurance.

According to Kocabasoglu et. al., (2007) just those managers who completely perceive the significance of natural issues and countermeasures incorporate eco-innovations in their key plans and allot comparing assets to execute them. Cheng et. al., (2014) says that the final item and its generation procedure are two extraordinary and significant viewpoints adding to the ecological effect. The previous includes eco-item advancement and the last includes eco-process development. Consequently, managers with more grounded risk awareness experience higher natural weight and will in general designate assets to eco-advancements that make a significant commitment to ecological execution, for example, eco-procedure and product development.

Consequently, they are indifferent to or denigrate the risk and expense of eco-development. Managers with increased environmental awareness are increasingly able to recognise the hidden commercial opportunities of ecological concerns and to learn from their competitors' best natural practises. One reason a management may be reluctant to adopt eco-innovation is that the company finds it difficult to see the benefits, especially when travel is not involved. (Linde, 1995). Managers typically assume that waste control is a very expensive investment, and as a result, they do not place much emphasis on the need of considering ecological concerns (Li, 2014). Even though eco-innovation initiatives have several benefits, corporate managers rarely take them into account. Managers with higher cost and benefit analysis hence inclined

toward eco-advancements with higher development execution and lower speculation and will in general recharge their items to catch openings coming from natural issues. Thus, we can propose that:

Proposition 2a. *Managerial environmental risk awareness encourages the adoption of eco-packaging innovation.*

4.2.2 Managerial Cost/Benefit Awareness and Waste Preventing Eco-innovation.

Third, we accept that managers with higher ecological mindfulness are probably going to pick proactive environmental strategies (Murillo-Luna et. al., 2011 Liu et al., 2015), which can cut outflows well beneath the levels legally necessary, lessening the association's consistence and risk costs, because of the outer ecological test from predominant partners (Hart and Ahuja, 1996). We contend that managers with higher environmental risk awareness will in general receive or dispatch eco-process and eco-item developments to manage ecological contamination issues. Eco-management advancement is regularly, truly, a practical and transient arranged activity to manage the ecological test from overwhelming partners. It is unlikely that eco-management innovation will be able to address the "primary issue" without the aid of mindfulness, and these ecological activities will likely become more prominent. (Buysse and Verbeke, 2003).

Additionally, we argue that managers who are more conscious of environmental risk are more likely to respond to environmental issues by developing eco-products rather than eco-processes and environmental management systems. The justification for this contention is that eco-process development is more innovation and capital concentrated, and the venture is hard to restitution through item market trade with an ecological premium; it is additionally hard for eco-management innovation to meet the higher financial return necessity. With the expanding improvement of global environmental concerns, the main concern arranged ecological activities, for example, eco-management innovation, are broadly utilized and are slowly turned into an asset with diminishing negligible returns and protection like highlights (Flammer, 2013). Based on the above arguments, we propose the following hypothesis:

Proposition 2b. *Managerial environmental cost awareness encourages the adoption of eco-packaging innovation.*

4.3 Eco-Capabilities for Environment and Waste Preventing Eco-innovation.

According to Gabler et. al, (2015) combination of the dynamic capabilities of a firm and resource-based theory is used to understand the main driving forces behind the adoption of environmental strategies of a firm. A firm can use its orientation and internal resource innovation to create eco-capabilities. He divided these capabilities into three components (1) Human; (2) Business and (3) Technology. Marcus and Anderson, (2006) used a combination of four elements to explain the environmental capability of a firm. These factors are named: (1) human capability (employee training and education); (2) technological innovation (3) Innovative recycling and, (4) fundamental recycling. But as reported by Turrisi et. al., (2013) and Gabler et. al, (2015) two of these factors are directly related to recycling, therefore, they may not represent eco-capabilities instead of that we can term them as reverse logistic capabilities of a firm.

Similarly, World Commission on Environment and Development-WCED (1987) explain the main objective of the sustainable development approach is to decrease the impact of a firm's production process on the environment. This ecological impact could only be reduced by the integration of environmental strategies and resources within a firm resource so that they should not be separated easily (Teece, 2009) and by using these ecological resources to improve the production process of the firm (Helfat and Perteraf, 2003). Hence, eco-capability is the combination of acquisition, application, retention, and application of firm resources for the reduction of the environmental impact of a firm to improve productivity (Ngo and O'Cass, 2009). Using Powell and Dent-Micallef, (1997); Marcus and Anderson, (2006), and Gabler et. al, (2015) we are dividing eco-capability into three elements. These are technological capabilities, human capabilities, and research and development capabilities.

4.3.1 Technological Capabilities for Environment and Waste Preventing Eco-Innovation

Eco-innovation in packaging is also known as green packaging, sustainable packaging, and eco-friendly packaging and it refers to the reduction in the environmental impact of packaging. The most recent terms for the same packaging are bio-friendly, biodegradable, eco benign, and bio benign (Guillard et. al., 2018). This new green packaging is based on green chemistry and green technology principles (Singh and Pandey, 2018). These green/ eco-friendly technologies use less temperature and generate less chemical and other waste while their production processes (Mironescu et. al., 2021).

Technological capability is a necessity for eco-innovation as companies need to be technologically innovative to introduce environmental change (Aldieri et al., 2019). Eco-innovation is successful if the firm has higher technological capabilities (Doran and Ryan, 2016; Tsai and Liao, 2017). For instance, a study on Tetra Pak's head office in China (Shanghai) and Brazil by Batista et. al., (2019) highlights the packaging waste recycling technological capabilities so that they have recovered raw material from the packaging waste for new eco-packaging. The case study also added that Tetra Pak's technological capabilities are helping the companies to introduce new eco-designs and eco-materials for waste reduction.

Technological capabilities are helping companies to track and trace the actual product and packaging and returns for life cycle assessment. This data is helping the company to use technology and innovation together for waste reduction (Meherishi et. al., 2019). Similarly, the incorporation of the sustainability aspect in the technology for environmental research and development leads to building technological capabilities for eco-innovation (Pacheco et al., 2018; Demirel and Kesidou, 2019). After discussing the above information, the following proposition is structured:

Proposition 3a. *Technological capabilities facilitate the successful adoption of eco-packaging innovation.*

4.3.2 Human Capabilities for Environment and Waste Preventing Eco-innovation.

Human capabilities in form of human support are a very important element in the adoption of eco-innovation (Emamisaleh and Rahmani, 2017). To build human resource capability firm needs to equip employees with knowledge and skills, via training, workshops, seminars, and virtual learning programs (Kamble et. al., 2020). These human resources not only improve the working efficiency within a firm but also help in successful collaboration and partnership with different stakeholders of the company (Castro and Swart, 2017).

Human capability in terms of hiring and training employees is considered one of the key organisational capabilities for the efficient use of resources for environmental innovation (Demirel and Kesidou, 2019). Similarly, if a company is investing in sustainable practices, it is also required to invest in human skills, knowledge, training, and competencies to successfully achieve sustainability. Therefore, during innovation, research for the environment, and the sustainability process, hiring new people with expertise is very important (Giacomarra et. al., 2019). Human resource management policies also help companies to build human capabilities to achieve environmental goals set by the company (Uddin and Islam, 2016). This eco-friendly

human resource focus on environmental practices including recycling, reducing CO2 emissions, eco-innovation, and waste management (Poornima, 2013; Ahmed, 2015). In this way, using green human resources in recruiting, training, and recruitment helps to develop human capabilities, which is crucial for environmental innovation and sustainability (Staffelbach et. al., 2012; Mashala, 2018). The argument below is built using the above justifications:

Proposition 3b. *Human capabilities strengthen the successful adoption of eco-packaging innovation.*

4.3.3 Research and Development Capabilities for Environment and Waste Preventing Eco-Innovation

Research and development capability is essential to understanding and learning external resources and building technological capabilities within a firm for eco-innovation (Williander, 2007; Pacheco et al., 2018; Demirel and Kesidou, 2019). Much research on environmental research and development (Demirel & Kesidou, 2011; Lee and Min, 2015; Costa-Campi et. al., 2017; Melander, 2018) demonstrated that eco-innovation and research and development have a good link. Research and development capabilities help a firm to understand and invest in eco-technologies for better technological capabilities and eco-innovation (Demirel and Kesidou, 2019).

The research and development process is helping companies to work with innovative technologies to achieve the desired innovation (Fleming et. al., 2021). Companies are making new innovative products through research and development and gaining market share (Trott, 2011). If an organisation is not investing in research and development to build internal research and development capabilities for innovation, a firm cannot achieve successful innovation and will also lose its competitive advantage (Chumaidiyah, 2012). Research on Taiwan's technological company (Trott, 2011) determined that the company introduced product innovation effectively because it built research and development capabilities along with the ability to manage new technologies. Similarly, the combination of upstream and downstream research and development contributes to higher process innovation (Un and Kazuhiro, 2015).

Research and development capabilities can also be developed in collaboration with external research institutes and universities (Chamusuk et. al., 2017). Research and development and technological capabilities together are essential to compete in the market and introduce innovation (Lee, 2009). Companies with a lack of knowledge should invest in research and

development for getting more valuable knowledge and building internal resources for innovation. Contrary to that companies with strong research and development and knowledge should collaborate with external companies to share their knowledge and experience (Lin and Wu, 2010). The following proposition is proposed considering the analysis just mentioned:

Proposition 3c. *Research and development capabilities stimulate the successful adoption of eco-packaging innovation.*

4.4. Green Marketing

According to Charter and Polonsky (1999), "green marketing" is the promotional strategy or advertisement of a product based on that product's performance measurement or an improvement thereto (Lee, 2008). A key component of the entire company strategy is green marketing (Menon and Menon, 1997; Prakash, 2002). Additionally, changing the conventional marketing mix (product, price, place, and promotion) necessitates a grasp of public policy procedures. Ecological and environmental sustainability challenges, such as extended producer responsibility, life-cycle analysis, material usage and resource flows, and eco-efficiency, are also directly related to green marketing. Thus, the topic of "green marketing" has a wide range and significant ramifications for company strategy and governmental policy (Prakash, 2002).

4.4.1 Relationship between Waste Preventing Eco-packaging and eco-labelling.

The application of an eco-label to items that are environmentally friendly is one of the most important green marketing strategies (Rahbar et. al., 2011). Eco-labels describe the whole environmental performance of a product or packaging (Giridhar, 1998; Nik et. al., 2009). They were created as indications of a product's environmental performance in an effort to prevent customers from being misled by promises of environmental friendliness (Childs and Whiting, 1998; Nik Abdul Rashid, 2009).

The manufacturing, distribution, usage, and disposal of the product would all be considered by a good eco-labelling scheme. There are two types of eco-labels: claims made by oneself, and claims made by unaffiliated third parties. Manufacturers, retailers, or marketers may make self-declaration claims about a product based on a specific attribute or a general evaluation of the item. There are a variety of product claims that are often listed on the packaging, such as "natural," "pesticide-free," "biodegradable," and "recycled content." (Nik et. al., 2009).

Rex and Baumann (2007) interpret eco-labels as an instrument for customers to help them make decisions about purchasing environmentally friendly items and to educate them about how such

products are manufactured. Eco-labels, in the opinion of Nik et al. (2009), are appealing tools for informing customers about the environmental effects of their purchase decisions. Eco-labelling initiatives were started to encourage environmental consumerism by assisting customers in identifying items that are more ecologically desirable than other comparable products. According to research by Nik et al. (2009), customer understanding of green products and purchase intent are positively impacted by eco-label awareness (Rahbar et. al., 2011). Therefore, based on the reasoning above, we may state that:

Proposition 4a. *Eco-labelling, an element of green marketing is an outcome achieved by Eco-packaging innovation.*

4.4.2 Relationship between Waste Preventing Eco-packaging and Environmental Advertisement

Green advertising, according to Eren-Erdogmus et al. (2016), is a marketing strategy used by businesses to get favourable standing in the eyes of consumers. Green packaging using companies are focusing on social media and environmental advertisements to communicate their environmental efforts. This environmental advertisement increases consumers' knowledge regarding packaging recyclability and biodegradability (Nguyen et. al., 2020). According to Sambu (2016) and Yildiz ankaya & Sezen (2019), green packaging and green advertising are related since they both provide businesses a competitive edge.

Environmental advertisement is used to promote the eco-friendly efforts of the company by using green colour, recyclability features promotion, eco-labelling, and eco-friendly raw materials (Wahab and Eneizan, 2016). These environmental advertisements attract customers, especially those who are environmentally conscious, by using eco-friendly packaging. These environmental advertisements are helping companies to convey environmental responsibility messages on their behalf to improve their image (Keh and Xie, 2009).

Proposition 4b. *Environmental advertisement is a medium to promote Waste preventing features of eco-packaging innovation.*

4.5 Eco-packaging for Green Brand Image

A product's name, logo, or design that is environmentally friendly is known as an eco-brand (Rahbar et. al., 2011). A particular set of brand characteristics and advantages connected to the brand's decreased environmental impact and its perceived as being ecologically sound create a green brand identity (Hartmann et al, 2005). A brand's positioning may be based on both

practical qualities and/or psychological advantages. Here, green brand positioning techniques are divided into functional and emotional categories. Providing details on environmentally friendly product qualities is the goal of an environmental positioning strategy based on the functional brand attributes, which tries to create brand connections. This positioning approach should be based on the environmental benefits of the product over competing for traditional items, and may pertain to production techniques, product use, and/or product disposal (Meffert and Kirchgeorg, 1993; Peattie, 1995; Hartmann & et al, 2005).

The fact that a product's reduced environmental effect typically does not result in personal advantages for its consumer, however, may provide a barrier to the success of a marketing strategy that promotes the product purely by its functional features. As a result, the perceived consumer advantage might not be strong enough to spur brand purchases (Belz and Dyllik, 1996; Hartmann & et al, 2005). Additional drawbacks of functional positioning techniques include their propensity to be readily copied, their reliance on rational consumer behaviour, and their potential to limit the scope for brand distinction (Kroeber-Riel, 1991; Aaker, 1996; Hartmann & et al, 2005). According to Hartmann et al. (2005), there are several emotional brand advantages, including a sense of well-being, the ability to express oneself via consumption in public, and benefits relating to the environment. (Rahbar & Abdul Wahid, 2011). The material mentioned above demonstrates that:

Proposition 5. *Eco-innovation in packaging stimulates the green image of the company.*

4.6 Eco-innovation in Packaging for Waste Prevention

Many businesses have chosen environmental advertising in the media or in newspapers as a green way to reach consumers who care about the environment, which is concurrent with the growth of green movements globally and rising public awareness of environmental issues. The aim of environmental advertising is to motivate customers to make environmentally responsible purchases while also drawing their attention to the benefits of such behaviour for both the environment and them (Rahbar et. al., 2011). According to Baldwin, (1993), A consumer's values are shaped through environmental advertisements, and these ideals are then translated into the purchasing of environmentally friendly goods and learn about proper disposal of packaging waste to reduce it from landfills.

Proposition 6. *Waste prevention is an outcome achieved by the firm after the successful adoption of Eco-Packaging innovation.*

CHAPTER 5

RESEARCH METHODOLOGY

5.0 Introduction

This Chapter is explaining the methodology and research design being used in this study to achieve research objectives. It is also discussing the specific research approaches and research strategies used by the researcher to understand the research phenomenon by comparing different alternative methods. For this study, case study research methodologies were used, and this chapter will detail all the actions that the researcher had to take as part of the case study protocol to maximise the trustworthiness of this research (Eisenhardt, 1989; Yin, 2014). The chapter is also explaining all four company cases selected specifically keeping eco-packaging adoption into consideration. It is also explaining the process of data collection, data collection instruments, and different sources to collect the data. In this part, the interview guides the development process. Interview guidelines for semi-structured interviews, sampling techniques, and the selection of sample size will also be discussed.

In the next part tools, techniques, and data analysis process will be explained along with the research finding and discussions. Based on the findings of this research, the usage of NVivo is discussed for qualitative data analysis. NVivo is a very helpful software for data organisation, coding, thematic analysis, inter-case, and intra-case analysis, and its visual presentation.

Data validity and reliability are also covered in this chapter. Since this study's research participants were humans, information gathered through interviews was also verified against other materials accessible on the websites of case companies. An ethical protocol is followed to ensure the trustworthiness of the collected data. The Newcastle University ethical approval was the first stage of this data collection process. All research participants are ensured that their identity will be kept anonymous, but the research purpose was also explained carefully and thoroughly.

Refining Research scope:

The research is structured to explore eco-innovation in packaging by aiming to reduce the use of plastic as packaging material by food and drink companies. The first aim is to explore how different food and drink companies are taking decision to adopt eco-friendly packaging to

remove plastic as packaging material. It will help researcher to understand the factors or stakeholders that facilitate the adoption of eco-packaging innovation within food and drink sector. This will also make it clear to the researcher that what was the environment during making the decision for the eco-packaging adoption by the company. It will help to understand the key stakeholders to facilitate that help company to solve plastic packaging related environmental problems. When company agrees to stop using plastic and introduce eco-friendly packaging the next question came into mind that what are the main drivers that facilitate the reduction of plastic material usage in packaging and increase the usage of eco-friendly packaging materials.

The answer to the above question regarding drivers of eco-packaging also establish the details of interconnection between different drivers of eco-packaging within food and drink sector. After that the relationship between eco-packaging and waste prevention will also be studied so that this research can add a new validated relationship between eco-packaging and waste reduction in the existing literature.

5.1 Research Philosophy

This section will explain the research philosophy used by the researcher based on her philosophical stance. According to Saunders et. al., (2019; p. 130) research philosophy is a “*system of beliefs and assumptions about the development of knowledge*”. There are five main research philosophies for social science research these are positivism, positivism, interpretivism, critical realism, post-modernism, and pragmatism (Healy and Perry, 2000). All these research philosophies are not the same if we consider their ontological, epistemological, and axiological assumptions for all of them.

Ontology refers to people's views about the world based on their learning and factual experience. Epistemologies are assumptions about the given knowledge as it explains how the knowledge we know and how much we know (Crotty, 1998). Saunders et. al., (2009; p. 119) describe ontology as “*the researcher's view of the nature of reality or being*”. And epistemology refers to “*the researcher's view regarding what constitutes acceptable knowledge*”. On the other hand, axiological assumptions are linked with participants' and researchers' ethical values that how much honesty and ethics they show during the research process (Saunders et. al., 2019). As researchers' and respondents' ethics and values directly influence the research data collection process.

According to Easterby-Smith et. al., (2002) positivism originated from French philosopher Auguste Comte, 1853. It is predicated on the philosophical premise that we can observe, quantify, and generalise social reality based on scientific rules, just as we do in scientific investigations (Corbetta, 2003; Saunders et. al., 2016). We can collect quantitative data to ascertain the relationship between variables or study phenomena without being based on a researcher (Saunders et. al., 2019). In positivism cause and effect, relationships exist as a reality in the world without being affected by the beliefs of people living in this world (Denscombe, 2002).

The second most important epistemological paradigm for social science is interpretivism (Bryman and Bell, 2007). In interpretivism reality is affected by the respondent's experience, culture, thinking, circumstances, and own understanding of the world (Saunders et. al., 2019). It is thought of as a qualitative research technique that aids in a deeper comprehension of a phenomena by the researcher. In simple words, the researcher observes and examines the characteristics of a social phenomenon to understand the causal relationships according to his interpretation by getting knowledge about the abject (Corbetta, 2003).

Interpretivism does not believe in generalisation like scientists as according to interpretivism philosophy, reality has some limitations and it is not constant or the same each time it may change over time, therefore, interpretivism is examining the phenomena from the view of the participant that may vary from person to person and time to time (Saunders et. al., 2019). Positivism and interpretivism are the most common research philosophies in marketing research and have been used constantly under their qualitative and quantitative methods for data analysis (Collis and Hussey, 2013).

According to Danemark, (2002) critical realists did not rely on theories, opinions, and interpretations. It means reality is directly affected by the ideas, knowledge, and thinking of any person. Therefore, the researcher uses observation, sense, and knowledge to understand, adapt, interpret, and describe reality. Fleetwood, (2005; p.199) believes that for an entity to be real it should have cause effectiveness, behavioural impact, and create a difference.

According to Saunders et. al., (2016) postmodernism is a business research philosophy used to contest the existed theories and concepts to reveal the hidden realities or suppressed biases in them. This philosophy is not in favour of objective knowledge, scientific reality, and historical truth rather it favours subjective knowledge and belief in multiple opinions. Postmodernists

(followers of postmodernism philosophy) consider that scientific advancement is straight and perpetual, but it is the opposite of that (Easterby-Smith et. al., 2012).

Postmodernism can be valid philosophy for social science studies, specifically research that is based on organisations as the unit of analysis. Our environment is always changing, which is why this concept allows organisations to deal with many circumstances based on a dynamic environment. So, for postmodernists, invention was one of the most crucial components of a successful business (Aldawod and Day, 2017).

Charles Pierce, William James, and John Dewey developed the concept of pragmatism in the United States in the late nineteenth and early twentieth centuries (Morgan, 2014). Pragmatism believes in different realities and the fact that only one point of view cannot explain the entire picture clearly. Thus, they argue that research philosophies are not just straightforward assertions but also beliefs that govern social situations that directly affect the study enquiry, pragmatism integrates beliefs with actions (Thornhill and Lewis, 2016). The following table is comparing different research philosophies based on their ontology, epistemology, research methods, and axiology.

Table 5.1: Research Philosophies

		Positivism	Interpretivism	Critical Realism	Postmodernism	Pragmatism
Philosophical Assumptions	Ontology What kind of thing is reality?	Although reality is true and existing, but researchers and reality are different from each other. Facts can be disclosed. One true reality (Universalism)	Researchers and reality both relate to each other and are inseparable. Complex and rich Socially constructed through cultural values	External, Entities and events Observable and Unobservable Mind-Independent and fixed Word's Strata (real, actual, and empirical)	Participative reality No single reality, there are multiple realities and interpretations. The real word exists but is difficult to understand because of human perceptions	Reality is the practical consequences of ideas. Complex, Rich External Multiple views
	Epistemology How do researchers know the reality?	Objectivists: Reality exists beyond the human mind and is independent of the subject or object. Causal explanations and predictions as contributions	Subjective: Realty is subjective to human experience and knowledge. Theories and concepts New findings as worldviews and contributions	Multiple Fallible Socially constructed knowledge Link with historical events for explanations and descriptions	Objectivists but modified/ Social subjectivism. World only known via discourse. No knowledge is better than any other (relativism)	Practical meanings of knowledge are specific context. True theories and knowledge Problem-solving and future practice as a contribution
	Research Methodology How can we find out answers?	Quantitative Research methods Can also use qualitative. Highly structures large samples Questionnaires Experiments Hypothesis testing	Qualitative Research methods Small study samples In-depth investigation Phenomenology Hermeneutics	Qualitative Research Methods Data triangulation Abstraction Retrodiction	There is no single best method for data collection. Typical qualitative methods for analysis Experimental Manipulative	Both qualitative and quantitative methods Mixed-method research Multiple methods research Action research Focus on practical solutions and outcomes

		Statistics Content Analysis				
Axiology What part do a researcher's beliefs have in their research?	Value-free, The researcher is unaffected by the evidence, logic, or true knowledge.	Value-bound research Research is constantly an element of another research; hence it is always subjective. A crucial element is interpretation.	Value-led research Researcher reduces errors and bias in data. Freedom equality Emancipations are valued	Value-laden research Research and research are connected via a powerful relationship	Importance of values for result interpretation Cultural values, experiences, and upbringings affect the research findings	
Adapted from: Lincoln, et al. (2011), Easterby-Smith, et. al., (2012), Wahyuni (2012), Creswell (2013), Bryman (2016) and Saunders et al. (2016).						

This research is about the drivers that helps during the decision-making process of adopting eco-packaging innovation by food and drink companies. This topic is considered as an interdisciplinary process that depends on the work of different disciplines. To design a packaging different social technical and environmental factors are considered by the companies and these facilitating drivers are corelated with each other (Guercini, 2014). Therefore, it is not possible to isolate them are investigate the independently by keeping them separate from each other. Thus, this research cannot use positivists research philosophy to identify and combine logical knowledge (Susman and Evered, 1978).

Interpretivism philosophy for research:

This study favours the interpretivism philosophy (based on ontological and epistemological assumptions). Additionally, it is assisting the researcher in developing a thorough grasp of the eco-packaging phenomena, its causes, and its effects from the perspective of the production firms for each type of food and drink. According to Gorden, (2002) researcher can focus on explanatory and likely generalizable outcome of the study rather than insisting on perfect objectivity. He also added that all research data can be presented as a ladder to explain researchers "*cognition of the world*". At this point an intercede philosophical approach (middle of positivism and interpretivism) help researcher to connect research problem with his research approach.

There are three different methodologies are considered from three different disciplines (management, sustainability, and designs) to fulfil research needs and explain the answers of the research questions. After considering studies from different disciplines the research methods that considered most appropriate for this research are case study, action research, stakeholder theory and design research (Wiek and Lang, 2016). Case study research method is used by the researcher to support research philosophy. The case study research's propositions and data collecting procedure are both impacted internally by the existing eco-innovation literature. According to interpretivism, the researcher can create a model or framework based on understanding of the connections between study phenomena by using the philosophy of previous research (Yin, 2014).

By using interpretivism research philosophy this research is focusing on exploratory research design to extend the knowledge about eco-packaging as a waste management strategy from the food and drink companies' perspective. This will be understood from the company's managers point of view that what kind of internal capabilities and external drivers were behind the

adoption of eco-packaging and what chances they observe after this adoption as an impact on their company.

5.2 Research Approach

Earlier in this research's development, the researcher employed a variety of theories to comprehend the phenomena that the research topic is founded on. The study subject is then utilised as a guide to comprehend the gaps in the earlier literature on the same issue. Based on the weaknesses and the topics that are not exclusively used for the research phenomenon, the research draws an initial research framework. At this stage when the researcher has deep knowledge and understanding of his research topic and theory related to his research, the next phase is to understand whether the inductive or deductive approach will be good for this research.

There are three main research approaches inductive research, deductive research approach, and abductive approach. The inductive approach is used to build a theory after empirical data analysis (Saunders et. al., 2016). A theory is developed by observing, seeking details, and getting a deep insight into the phenomenon (Spens and Kovacs, 2006). In the inductive approach, research moves from fact to theory, by the collection of data from empirical cases to generalise a law (Taylor et. al., 2002). Based on what Saunders et. al., (2016) said about the inductive approach, the research will analyse the empirical results to develop or improve a theory. In this approach, comparatively small samples are used to understand problems for the development of a theory or give a different definition to the existed theory, but it has a very small link with generalisation (Saunders et. al., 2016)

On the other side, the deductive approach is a theory-testing technique to identify a specific conceptual application in a particular circumstance (Hyde, 2000). In this approach existed theory can be used by the researcher to draw a model or research framework for his research propositions. He can later empirically validate that framework and propositions to improve it. Therefore, Perry, (1998; p. 790) explains that in the deductive approach *“the prior theory informs all main data collection equally and a new theory is generated from all cases in one operation of cross-case data analysis across all the main cases”*. The large study samples are used to collect data for already defined concepts to measure them for making a law to generalise them (Saunders et. al., 2016)

Suddaby, (2006) defined an abductive method as a blend of an inductive and a deductive technique. It first explores the phenomenon to find the research problem, after that, a theory is developed, and modified and then propositions are developed based on that theory (Saunders et. al., 2016). This method uses qualitative data for proposition development and then use quantitative data to test those propositions and theory. The following table is highlighting the basic contradictions between these research approaches.

Table 5.2: Major contradictions between deductive, inductive, and abductive approaches

	Deductive approach	Inductive approach	Abductive approach
Logic	Uses scientific methods. Movers from theory to data Use data to test the theory. Explore causal relationships. Quantitative data Very much organised method Independence of the researcher from the subject under study	Human understanding has a direct effect on data meanings. Limitations are developed to draw untested conclusions. Qualitative data More flexible approach The researcher is closely linked and an essential part of a research	combines the deductive and inductive approach. Start with observation that will be the end conclusion of the study. Explanations are constructed to test later. Themes and conceptual framework are identified after data collection and exploration. The framework is tested again by collecting the data a second time
Generalisability	Efficient sample size is necessary for the generalisation of research results	Generalisation is not the main concern	Move from specific to general instructions
Theory	Theory Testing	Theory Building	Theory building or modification
Adopted from: Saunders et. al., (2019; p. 153)			

Different research approaches are taken into consideration by the researcher before finalizing one approach for this case study. The approach is the deductive approach. This deductive approach will help the researcher at the initial stages of qualitative research to develop initial themes from the already existing literature. The research's primary method, however, is not deductive because the study's primary goal is to develop the theory rather than test it. The researcher is attempting to gain an in-depth knowledge of the eco-packaging phenomenon from the UK food and beverage industry.

Inductive Approach:

This study is employing a small sample. So, this study is using an inductive approach based on deductive reasoning. Inductive approach is used to explain the themes and categories defined by the researcher after data analysis and comparison. Deductive approach is also used by using thematic analysis. Qualitative content analysis is used to derive initial codes from theory or findings of research analysis. The researcher used eight steps defined by Zhang and Wildemuth, (2006) for qualitative content analysis. These steps include:

1. Data Preparation
2. Defining the unit of analysis.
3. Developing data categories and a coding scheme.
4. Testing coding using sample text.
5. Applying coding on all textual data
6. Reading the coding to keep data consistency.
7. Use coded data to conclude research.
8. Writing reports on the used method and findings.

First step of qualitative content analysis is to transcribe audio data into written form. During this process there are some questions came into researchers mind that.

- Only main question should transcribe? Or all sub-questions also transcribe?
- Should I use summary or verbatim for transcribing interviews?
- Can I add sounds and other observations during interview in the transcripts?

Researchers decide to include all kind of data in transcripts by assuming that everything is important for the research. All transcripts are reviewed by the researcher to delete un-important sentences i.e., sentences that remain incomplete due to the sound or any other interruption.

In next step researcher defined coding units/unit of analysis to create understanding for interviewee. According to Zhang and Wildemuth (2006; p.3) researcher uses a code to define his theme or research issue and it can be represented by using one word, or combination of multiple words if it is used to represent main idea or problem studied by the researcher.

Next process includes develop data categories and coding schemes. These coding schemes and categories can be developed inductively or deductively by the researcher (Zhang and Wildemuth, 2006). It can be derived from data, previous studies, or previous theories relevant

to the research. In this research these codes and themes are derived from the interview developed by the researcher. Later, new codes and categories are added during data analysis. This inductive content analysis is used to develop new theory. As researcher have previous content or preliminary model that is developed by the researcher based on existing data, new inductively emerging theories will help to confirm research framework or model (Miles and Huberman, 1994).

In next step coding consistency is checked manually on sample text. According to Zhang and Wildemuth, (2006) coding consistency should be at appropriate level otherwise researcher needs to revise coding.

After achieving coding consistency all data should be coded. Coded consistency needs to be check again and again as with more addition of categories and codes, the coding consistency may be changed (Miles and Huberman, 1994; Bryman and Bell, 2007).

This coded data now can be used to draw conclusions. Researcher also needs to explain themes and categories. The concluded data will represent any amendments in his model/framework, defining relationships between themes and categories and newfound relationships in his data.

The last step is writing the whole data analysis process and writing reports on its finding and the methods he used during data analysis. This report will help other researchers to replicate the study therefore report should be accurate to help further research. In qualitative content analysis this report can use quotes to explain his research conclusions (Schilling, 2006) and can also represent conclusion by using images (Miles and Huberman, 1994).

The research develops propositions based on theory and linked with data. By collecting data and its analysis, the researcher will conclude that he is supporting those propositions, or he needs to modify them to contribute to practicality and theory.

Data Display as Bar Graph:

In qualitative research representing data in an attractive display is an important step (Miles & Huberman, 1994; Burke et al., 2005; Grbich, 2007; Slone, 2009; Yin, 2011). According to Miles and Huberman, (1994) visual display is used in the research to display complex and large piece of information that help researcher to represent his conclusions and actions to the reader. Similarly, (Lengler and Eppler, 2007; p. 1) define visual display as “*a graphic representation*

that depicts information in a way that is conducive to acquiring insights, developing an elaborate understanding, or communicating experiences”.

It is an easy way to compare data in form of simple graphs that can also be used to compare these results. These data display techniques help researcher to explain the connection between different important pieces of information (Grbich,2007). Using diagrams, charts, or graphs to represent data enhance presentation of qualitative research and help author to represent his work more accurately and interactively (Yin, 2011). But the visual data display should also be simple for the reader therefore it should not contain any un-necessary long information in it.

Graphs or any other kind of data display can be adjusted depending upon the researcher’s need and the information he wants to use to communicate with the reader. According to the Publication Manual of the American Psychological Association (APA), Ed. 6 every data excluding tables comes under figure category. These figures can be in form of image, graphs, drawing or charts (American Psychological Association, 2010).

This research is using NVivo bar graphs to display data to elaborate interviewees thoughts, compare cross-case interviewee views and create understanding to the new emerging knowledge. According to (Eisner, 1997; P8) the use of diagrams or bar graphs is *“illuminating rather than obscuring the message”*.

5.3 Research Design

This section will explain the research methodology, sampling, and sampling process for this research. Also covered are the methods for gathering study data, how they are analysed, the instruments used to do so, and ethical issues that should be considered while designing the study. The research design refers to the researcher thinking about how he will collect the data for his developed set of questions (Saunders, et. al., 2003).

A quantitative research strategy favours the gathering of quantitative data using numerical instruments, such as surveys, and numerical data in the form of mathematical sheets, and then uses statistical software to analyse the data. However, qualitative designs concentrate on gathering textual data through dialogues, interviews, and other means, and then analyse that material using a theme approach (Saunders et. al., 2016). The research design also specifies the industry, the unit of analysis, the geographical location of the study, and the technique to be used.

Table 5.3: Different between Quantitative and Qualitative research design

	Quantitative design	Qualitative design
Philosophy	Used with positivism, realism, and pragmatism	Normally linked with interpretivism but can be a part of pragmatism and realism
Objective	Analyse data quantitatively and extrapolate sample results to the target population.	Understand the underlying reasons. To understand the uncover trends, thoughts, and opinions
Approach to Theory	Deductive or Inductive	Deductive, Inductive, or Abductive
Sample	A large sample to represent the population of study interest	A small number of respondents
Data collection	Quantitative data collection Questionnaires Validation of data collection instruments Database on precise measurements	Qualitative data collection Interviews Open-ended responses Observations Field notes
Data Analysis	Identification of statistical relationships	Identification of themes and patterns
Outcome	Correlations Comparisons of means Statistical significance of research findings	Descriptions Narrative reports Quotations from respondents
Research Strategies	Survey Research Experimental Design Case Study	Action Research Case Study Grounded Theory Narrative Research and Ethnography
Adopted from: Johnsons and Christensen, (2008) and Saunders et. al., (2016)		

Qualitative research, in the opinion of Denzin and Lincoln (2011), is only associated with the interpretivism research philosophy. Qualitative results explain the verbal interpretations in form of text that helps the researcher to understand complex relationships more easily. Based on the research phenomena, the researcher is utilising qualitative case study methodologies to comprehend the research phenomenon by accumulating rich data to address research questions and achieve research objectives.

As there is limited time for the academic research to investigate the phenomenon from different angles with clear explanation and details and interpretation of the study phenomenon,

especially as the adoption of eco-packaging is an important phenomenon for the current world from sustainability, environment protection, and waste management point of view; the qualitative research approach is a justifiable methodology for this research. According to Gummerson, (2000) qualitative design is a useful tool for thousands of management and business studies in the last few decades. Meriam, (1992) argues that if the study is designed to analyse unique events or identify a phenomenon, the qualitative design is the best and most appropriate methodology for that study.

5.3.1 Case study Method

According to Eisenhardt, (1989; p.534) “*the case study is a research strategy which focuses on understanding the dynamics present within a single setting*”. A preferred research method for generating theories and exploratory inquiry is the case study (Eisenhardt, 1989; Handfield and Melnyk, 1998; Yin, 2009). Yin, (2014; p. 16) Particularly in a study when research constraints and environment are not clearly specified, a case study is characterised as an experience analysis that aids in the procedure of in-depth exploration. For the adoption of eco-packaging in the food and drink industry in the UK, the case study strategy is the ideal method.

A theory can be developed or expanded by case study research, but occasionally the theory is validated or strengthened using several case studies (Herriott and Firestone, 1983; Perry, 1998). When research questions start with what, why, and how, a case study is the appropriate strategy. On the other hand, a survey approach may be employed in research that begins research inquiries with the phrases who, what, where? how many, and how much (Yin, 1994; p. 6). To explore different drivers of eco-packaging adoption, multiple companies were selected as cases, that have already adopted eco-packaging. Multiple case study approaches are preferred by Ellram (1996; p. 102) to “*represent replication that allows for the development of a rich theoretical framework*”.

The study cases are selected based on replication logic instead of sampling logic (Yin, 2014). There are two types of replications explained by Yin, (2014), literal and theoretical replication. Literal replication, according to Yin (2014), refers to the notion that the study outcome is foreseen by the study utilizing the theoretical perspective of the research, and it is anticipated that all cases would explain comparable outcomes. Contrary to that if different cases are showing different results, opposite to researcher expectations, then it is termed theoretical replication. This multiple case study research is using literal replication logic as the case companies have already adopted eco-packaging and have a green image in the market.

Number of cases:

The next phase of research is the selection of the number of cases. Regarding the number of instances that should be employed in multiple case study research, there is no advice in the available literature. According to Yin, (2014) if the researcher is working with literal replication logic, then 2 to 3 cases are enough for research and if he is in favour of theoretical replication logic then 4 to 6 cases should be used in the study. Another recommendation regarding several cases for multiple case study research is given by Eisenhardt, (1989). According to Eisenhardt a minimum number of cases should be 4 and the maximum should be 10, to explain and generate the theory with fewer flaws and complications, along with its empirical approval. Therefore, the researcher is using 4 case studies in this research to understand the eco-packaging adoption drivers more comprehensively. These companies have already experienced the eco-packaging adoption process a few years ago. Yin, (2014) explains the following case study research steps to be followed by the researcher.

1. Writing a case study research question
2. Development of theoretical propositions based on existing literature.
3. Defining the unit of analysis to define research boundaries.
4. Following case study protocol and collection of data
5. Making logical connections between data and propositions
6. Setting the criteria for research findings interpretations

The following research questions are addressed through case study research:

- i. How much knowledge is available based on the given importance of Eco-packaging innovation for the environment and waste prevention by the food and drink industry?
- ii. How do external driving factors affect the eco-packaging innovation for the environment and waste prevention by the food and drink industry?
- iii. How do managerial environmental concerns link with the eco-packaging innovation for the environment and waste prevention by the food and drink industry?
- iv. How do Eco-capabilities affect the eco-packaging innovation for the environment and waste prevention by the food and drink industry?
- v. How does eco-packaging innovation is helping to prevent waste and affect the green image of the company?

Based on the pre-existing literature on eco-innovation and eco-packaging, the theoretical viewpoints are described in chapter 2. Case study boundaries specification is also essential (Yin, 2014) so as the time and scope of this research are fixed therefore the research will not consider broader issues in this research that relate to this topic. The key features of Eisenhardt, (1989) framework is recapitulated in the following table.

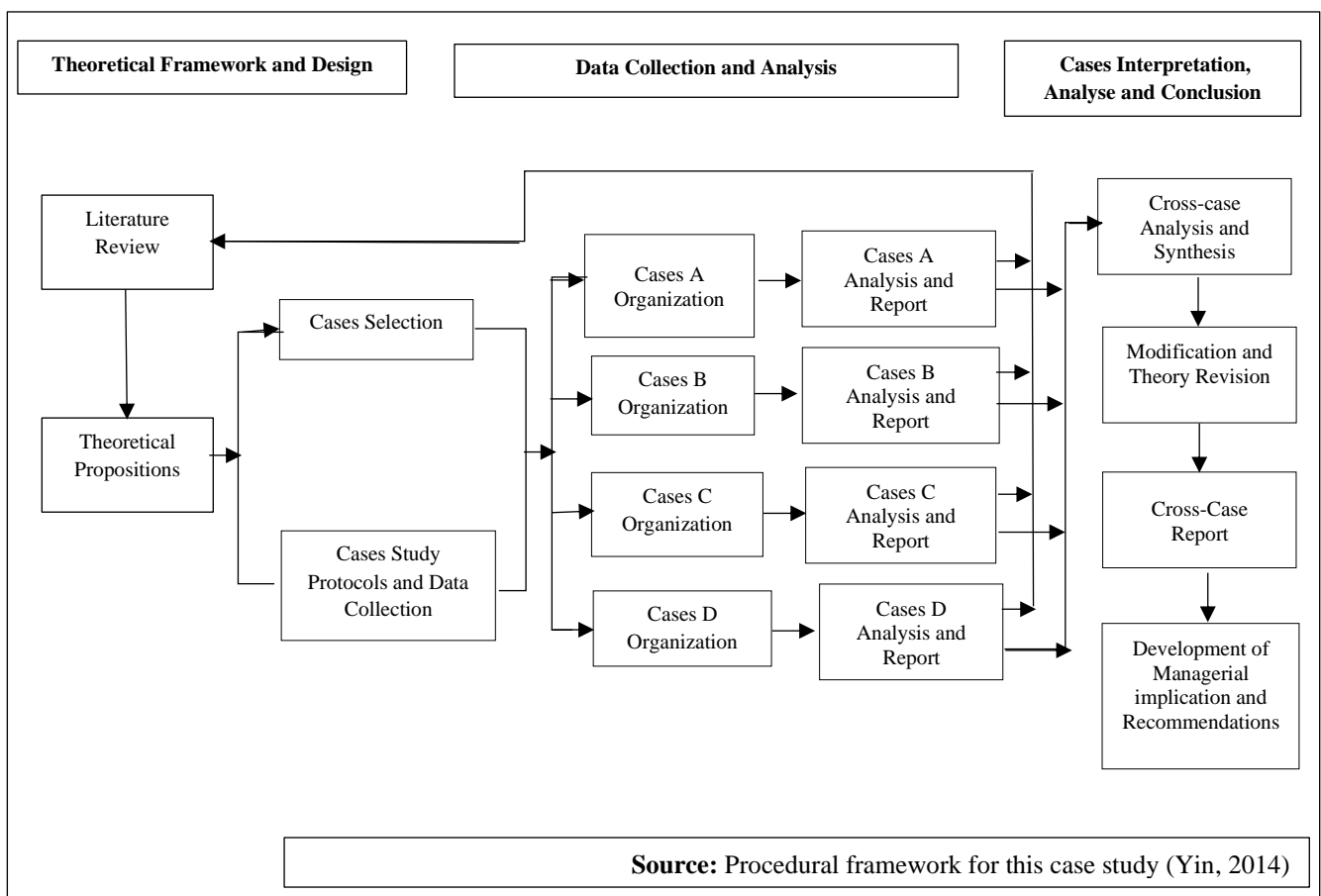
Table 5.4: Research Framework and Theory Development Process

Phase	Stage	Activity	Data source	Output
Phase 1	Getting Started	Literature Identification Gap Identification Development of Research Questions	Nature of reality on problem Comprehensive Literature Review	Research Problem Research Question
	Selecting Cases	Theoretical Sampling Select companies that underwent an eco-packaging adoption process.	Focus on cases specifically for extending existing theory	Single or Multiple cases Emergent theory
	Crafting Instrument and Protocol	Interview guide development and review by experts Data Source Identification Data collection methods Observations, webpages, documents, and interviews	Data Triangulation	Multiple data Collection methods Qualitative evidence collection
Phase 2	The field access	Reiterative data collection and analysis. Flexible opportunities in the data collection field	Improve the data collection instrument and helpful in identifying emergent themes.	Interview protocol Facilitates/identifies emergent themes. Triangulation of multiple data
	Analysing Data	Within case analysis Cross-case analysis (using thematic analysis)	Data familiarisation Data Codes Preliminary view of theory generation	Cross-Case patterns
	Shaping Theoretical Propositions	Repeating the same reasoning across scenarios and iteratively tabulating the material for each construct Search for the cause, i.e., the 'why' behind relationships	Improves the validity and definition of the constructs. Measurability strengthens, expands, and confirms theory. Increases internal consistency	Developed definitions and measures. Verification of evidence. Validation of findings. Refinement in the emergent theory
Phase 3	Unfolding the Literature	Evaluation considering contradictory literature. Evaluation of related publications	Strengthens construct description, increases conceptual level, and increases reliability and validity. Enhances generalizability, increases the theoretical	Builds generalisability theoretical level definition. Tying the emergent theory with existing literature

			bar, and clarifies construct definition	
	Closure	Theoretical saturation	Puts a stop to the procedure when a minor significant upgrade remains.	Theory Conceptual Framework/Model
Adopted from: Eisenhardt, (1989) and Halizahari, (2019)				

This case study includes companies that have already adopted eco-packaging in form of any eco-design feature in their packaging and have demonstrated some kind of change after its adoption. The interview participants are the people who have some level of knowledge about packaging, firm strategy for packaging, and different aspects attached to any kind of change in the packaging.

Figure 5.1: Case study design for the research



The logic is linking data and propositions that were developed at earlier stages of this research. Thematic Analysis helps to revise research propositions and validate the data in inter-case and

cross-case analysis. This whole stepwise process help researcher keep eye on relevant data and improve study findings.

5.3.1.1 Case study Protocol

To improve the framework of case study research, the case study protocols is a crucial prerequisite (Yin, 2014). This case study approach is also useful for developing research designs, comprehending the best data gathering methods, data processing, and presenting the research findings. Establishing consistency in data collecting and at the research's analysis stage is helpful when doing many case study studies (Yin, 1994). It also provides uniformity to the data if it is collected from different places at different periods. The case study protocol also contains appropriate research instruments. The research instrument can be qualitative, quantitative, or a combination of qualitative and quantitative, based on the research design and research problem.

Eisenhardt, (1989) also developed some guidelines to use case study protocol. His guidelines are very flexible and allow the researcher to use them in any case study protocol like the one created by Yin, (1994). The Eisenhardt, (1989) is perfect for researchers working on conceptual models for theory building. Although case study protocol has its importance in case study research still there are very few protocols are developed in the literature specifically for case study research.

To create a framework for the adoption of waste-reducing eco-packaging innovations in the food and drink industry, this research is adopting the case study design recommended by Eisenhardt (1989). This case study design by Eisenhardt, (1989) will help to determine the dynamic relationship between different drivers (External, Internal Eco-capabilities, Managerial Environmental Awareness) and eco-packaging adoption (Yin, 2009). The researcher is combining the case study methodology explained by Eisenhardt, (1989) and pilot work done by Chi and Javernick-Will, (2011). The combined research process is shown in the following table.

Table 5.5: Research Process

Step 1	Define Research Questions Selection of likely study subjects depending on the justification and goal of the case study research.
Step 2	case-by-case selection

Step 3	Following Interview Protocol and crafting research instruments
Step 4	Collection of First-hand data Find contacts and emails addresses of each case selected participants. Emails send to schedule interview appointments. Conduct the interview. Record all the sources of data
Step 5	Analyse Cases data Inter-case Analysis Cross-case Analysis
Step 6	Generate a report and refined framework
Source: Eisenhardt (1989); Chi and Javernick-Will, (2011) and Hu et. al., (2018)	

The Interview guide follows all important concepts that are explained in an earlier conceptual model of this research. The questions written for the interview were modified on the suggestions given by the academic panel and research supervisor. The changes were also based on the pilot study that was conducted by 3 employees of different food and drink production companies. All these changes help the researcher to bring an appropriate research instrument with all the needed questions linked with the conceptual model.

5.4 Data Collection

Plastic and other conventionally hazardous packaging materials have an impact on the natural environment, natural habitats, and human health, which has raised awareness of the need to use eco-design or eco-packaging innovation (Jiménez-Guerrero et. al., 2015). The purpose of this study is to comprehend how the food and beverage industry views the use of environmentally friendly packaging. Green or eco-packaging can be used as a competitive strategy (Tuwanku et. al., 2018) and a cost-saving option with less environmental footprints for a better reputation and brand image (van-den-Elzen, 2016). By making the best use of natural resources as raw materials and reducing economic waste, it helps a company achieve sustainability (achieving of the triple bottom line: social, economic, and environmental performance).

Global changes are also creating consumer awareness of the role of producers to decrease environmental damage through eco-friendly practices (Saravanaraj and Pillai, 2017). Environmental commitment has also become a part of the green marketing strategy of a firm to attain a competitive advantage by competing with rival companies in the industry (Arseculeratne & Yazdanifard, 2014); attain a green image, and improvement in performance

Emeizan et. al., 2016). It's essential to comprehend how companies are attracted to the adoption of such eco-packaging for green marketing, waste reduction, and better brand image.

Marketing strategies are changing over time as consumers are improving their environmental knowledge that which kind of activities or factors are responsible for this environmental deterioration. As a result of these ecological changes and demand for environmental protection, producers are changing their existing activities, introducing new eco practices, and re-introducing new strategies to show the less environmental impact of their activities (Gbadeyan and Omolekan, 2015). Consumers, competitive advantage, green image, green marketing, and better performance are not only contributing factors to ecological changes in a company's production process, product, or packaging. A company's adoption of eco-innovation is influenced by several other aspects that are discussed in the literature already in existence. The most significant factors that influence the adoption of eco-packaging for the food and drink sector will be highlighted by this research.

5.4.1 Unit of Analysis

According to Cavana et. al., (2008; p. 119) The definition of a unit of analysis is dependent on the goals of the study and includes *“the level of aggregation of the data collected during the subsequent data analysis stage”*. In recent times, it is almost impossible to consume or commercialise food and drink products without packaging, but the production and disposal of packaging materials is also a reason behind many environmental problems (Muhammad, 2021). According to a study by (Silvenius et. al., 2014), almost 20 to 30 percent of global warming is caused by the food and drinks production process, and 10 percent of which is directly related to their packaging. So, along with the main functions like food and drink protection and safe transportation their packaging is also contributing to the waste and pollution around the world. The volume of solid waste is also increasing because of the packaging materials' slow disposal process i.e., plastic (Eurostat, 2019).

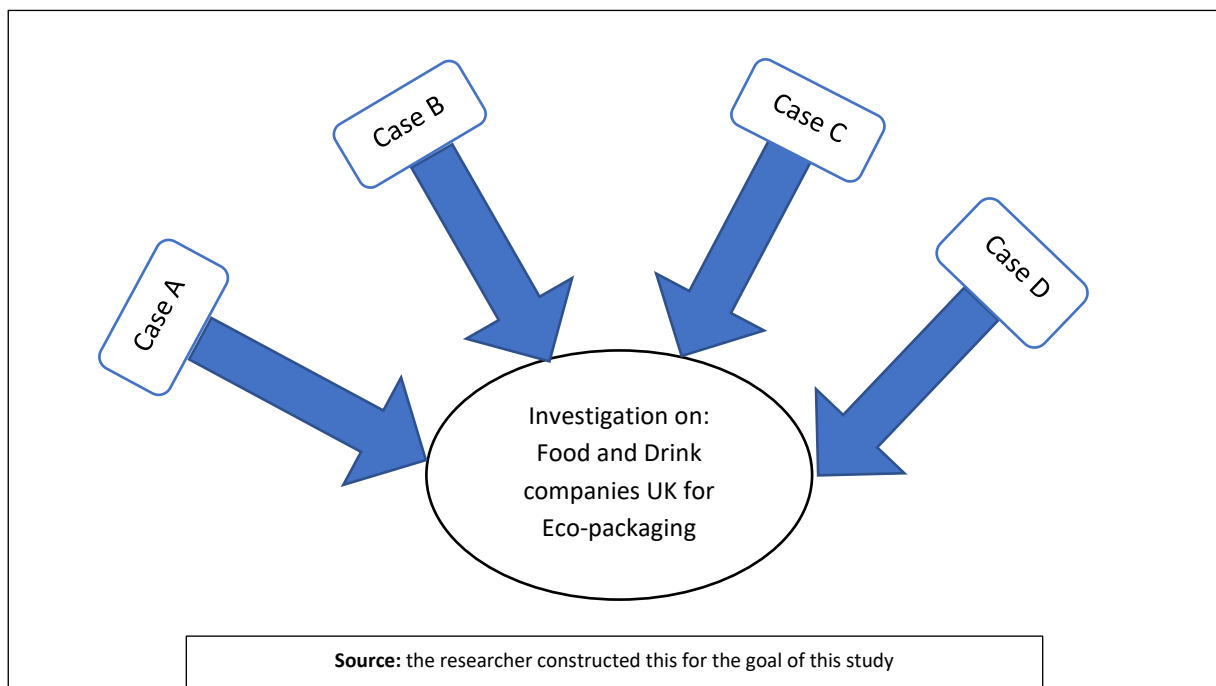
The UK has many packaging waste management legislations that are specially introduced for food and drink retailers and producers to handle their packaging waste as they have a direct connection with the packaging of their products. These reforms comprise the Waste and Resources Action Program and the Packaging and Packaging Waste European Directive (94/62/EC) (WRAP). The UK government is also releasing investment plans to assist food manufacturers and distributors with eco-innovation in the food and drink packaging to make it a little less hazardous to human health and the environment (Matsueda and Nagase, 2012;

Lindh, 2016 WRAP, 2017). For instance, the UK government has passed a funded agreement named “Courtauld Commitment” to provide necessary help in form of procedures to design sustainable packaging for food and drinks retailers for waste reduction, efficient use of resources, and environment protection. It has also introduced environmental technologies and many solutions for the development of food and drink packaging with the same functional features but with less household waste contribution (WRAP, 2018).

Food and drink packaging is the unit of analysis of this research. It evaluates the companies that already have shown an environmental change in their packaging to make it eco-friendly or adopted eco-packaging by completely changing their traditional packaging materials. The cases are selected based on literal replication of study results (Yin, 2014). Different companies were studied to identify their current and past packaging materials, their commitments for environmental packaging materials, and their future aims for waste reduction and packaging-related environmental problems solutions. There is extremely little empirical study on food and drink industry packaging, and there is also a limited amount of research on eco-packaging innovation. In existing literature eco-innovation in packaging is named green packaging, environmental packaging, eco-friendly packaging, and eco-packaging, and all these are considered synonyms in this research.

To conduct interviews with the food and drink companies’ employees, the researcher used her contacts and references. These respondents were contacted via email address and cell phone calls. These respondents are managers of different departments and different locations of the company. Case A and Case B have more research participants as compared to case C and case D as the researcher finds fewer volunteers in these companies. These employers started working in the company before the adoption of eco-packaging or the introduction of environmental features in the packaging via the change in materials. So that they have an idea and experience of change that the company feels after the change in their packaging.

Figure 5.2: Four cases in this research



5.4.2 Expert Interviews

Based on the perspectives of the research participants, this study employed interviews as research tools for data collection “*about the social world are socially constructed*” (Saunders et. al., 2016; p. 390). The research data is interpreted by the researcher at the analysis stage based on the respondent's perception (Denzin, 2001).

There are three types of research interviews unstructured, semi-structured, and structured interviews (Baumbusch, 2010; Hair et. al., 2016; Saunders et. al., 2016). Unstructured interviews are considered informal and in-depth, in terms of interview structure and study topic. The research questions are asked by the researcher on the spot after getting the respondent's point of view on the topic (Saunders et. al., 2016). Instead of pre-planning questions for this form of interview, the interviewer encourages the respondent to discuss, describe, and explain the issue from his point of view based on his knowledge and experience (Saunders et. al., 2016). A full description of the research phenomena based on the respondent's knowledge and experience is obtained from the interviewee using open-ended semi-structured interview questions (Ryan et. al., 2009).

Based on the research topic, themes, and understanding of relationships from prior literature, interview questions are developed. According to his needs and organisational conditions, a researcher using semi-structured interviews can alter the order of the research questions at any

point throughout the interview (Saunders et. al., 2016). The interviewer can also add probing during the interview to get insight into the data based on research questions and objectives (Saunders et. al., 2016). Structured interviews consist of a fixed questions list for the respondent to get his answers. The researcher is restricted to using the same order and same tone and voice to ask questions to eliminate biases (Hair et. al, 2015; Saunders et. al., 2016). From all the above three types of interviews, this research is following the semi-structured interview method.

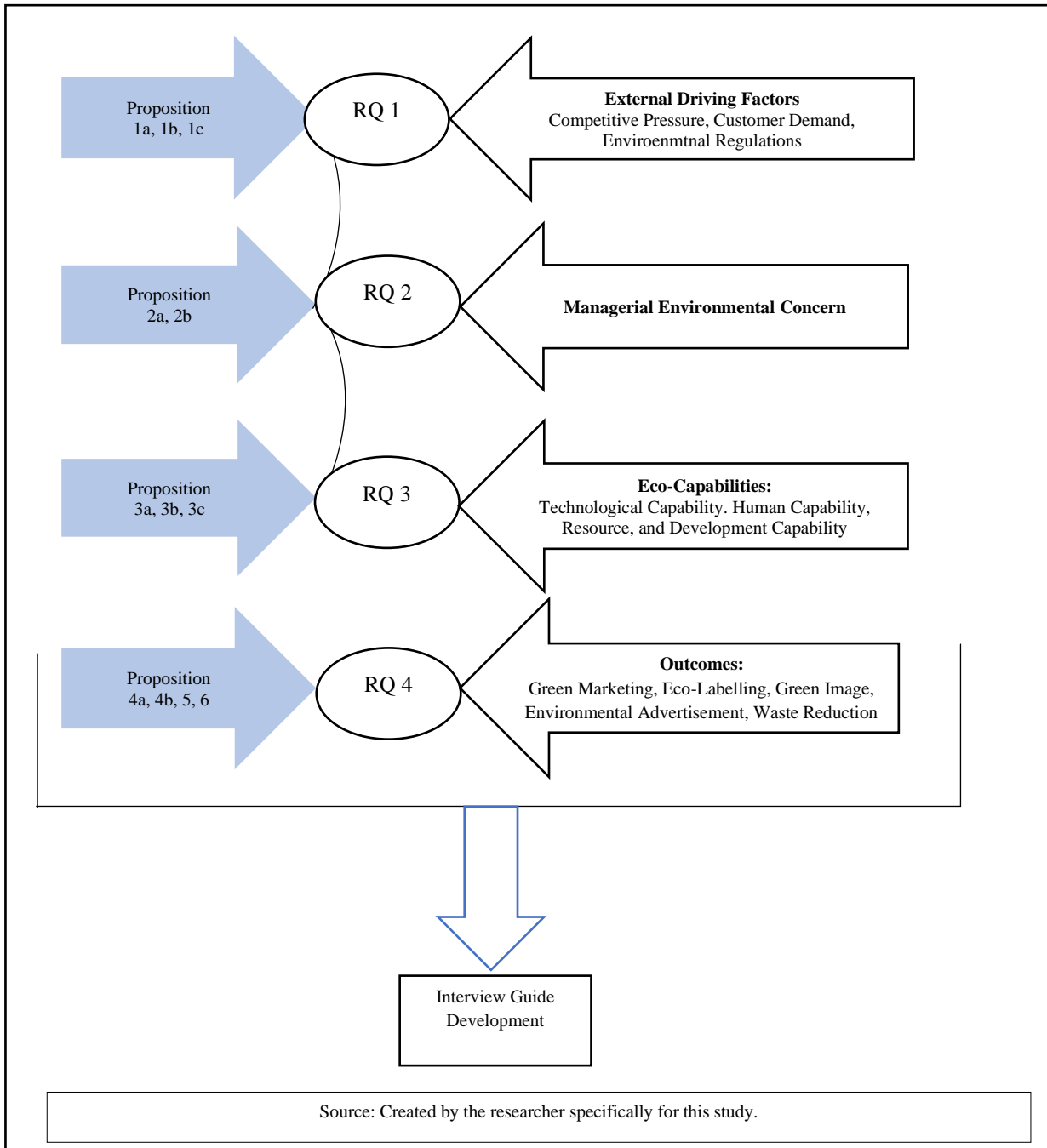
5.4.3 Semi-Structural Interviews

The researcher must have predefined study themes to examine in the form of a framework before conducting semi-structured questions (Miles and Huberman, 1994; Bryman and Bell, 2007). According to Lindlof and Taylor (2002; p.195), the interviewee should prepare an interview guideline before formal interviews that are based on the “*grouping of topic and questions that the interviewer can ask in different ways for different participants*”.

This fact supports the usage of study hypotheses that can assist the researcher in data collection prior to his study subject. If we find existing work on environmental packaging or eco packaging, we can have the idea that there is not enough literature available specifically for this topic of study. Although research is available for eco-innovation in general and sustainability, eco-packaging is not considered an independent topic of study. Some concepts i.e., sustainable packaging, eco-design innovation, green packaging, drivers of eco-innovation, managerial environmental awareness, eco-capabilities, green brand image, green marketing, and waste-reducing eco-innovation are existed in form of research themes and research elements in different marketing, sustainability, and design innovation-based research.

The research literature, propositions, and research framework relate to each other via themes and research questions are also developed accordingly (Miles and Huberman, 1994). Participants were given an interview guide and briefed about the research before the start of the interview. The structure of the interview was not completely followed by the researcher, as the researcher add some questions based on the respondent’s responses.

Figure 5.3: Interviews Guideline Development



The relationship between the study's conceptual model, research questions, and research propositions is explained in the above diagram. These research topics and assumptions form the basis of the interview guidelines and questions. The interview guide help researcher to keep his focus on the research topic without being worried about the specific format. This thing helps

the interviewer to change questions on the spot according to the respondent's answers to fulfil the need of his study (Lindlof and Taylor, 2002 and Saunders et. al., 2009).

5.4.4 Selection of Participants and Interview Process

This study is conducted to improve the packaging sustainability in food and drink industry by identifying the interviewees who are working for the companies that are using eco-packaging for their products. These people have specific level of knowledge related to packaging sustainability, specific packaging design requirements for their products and changing in their waste after adopting packaging materials other than plastic. These experts also have knowledge and experience in different capabilities and tools required by the company to use eco-packaging. This method is in favour of the research phenomenon by providing great understanding to the researcher about his study topic (Goffin et al., 2006; Acee-Eke and Gladson-Nwokah, 2018).

These interviewees are important stakeholders for the company that significantly contribute to the packaging related decisions of the company as this comes under their job responsibilities within the company. These respondents include research and development manager, technical manager and sustainability manager etc. The first company respondents also suggest different other companies that are already using eco-friendly packaging designs as their environmental responsibility and to decrease waste. So, the participant's selected for interview were knowledgeable about packaging sustainability, new environmentally friendly packaging around the world and they were happily willing to participate in research to share their experiences. Thus, this research will help many other food and drink companies to understand the benefits attached with the adoption of eco-packaging in terms of waste prevention and sustainability.

In qualitative research, for grounded theory, the number of interview participants is often determined by the theoretical saturation (Glaser & Holton, 2004; p. 54; Mason, 2010). According to Strauss & Corbin, (1998; p. 143) theoretical saturation can be defined as a "*point in category development at which no new properties, dimensions, or relationships emerge during analysis*". In these methods after data collection and analysis, theory construction takes place simultaneously.

In phenomenology, criterion sampling is the most common approach. The research participants are (Moser and Korstjens, 2017). selected based on the research phenomenon and their

experience with a research topic. These participants share their knowledge and experience of the phenomenon, but it will be a different experience for each participant based on his age and personal characteristics.

Sample Selection:

There are different views of different researchers on the exact number of samples for a phenomenological study. Creswell, (2007) is in favour of a sample from 6 to 25. According to Ellis, (2016) it is enough to consider 6 to 20 samples for phenomenological research. This research has 22 interview participants selected from four different companies (cases).

The samples were selected based on their working experience within the company so that they have better knowledge regarding the eco-packaging adoption process and its influence upon the food and drink manufacturing companies. Another limitation is the country from where empirical data was collected. As the UK is a multi-cultural country where people from different regions and races are working in different industries therefore the study samples are homogeneous, they are not completely the same.

Undeniably, all interviewees were very friendly and happy to share their experiences and knowledge so, it was a pleasant experience for the researcher to interview them. It will be an interesting idea to distribute them into different cultural groups to observe the effect of their culture on their experience, knowledge, and opinion.

The list of participants is also displayed in this section. Each company website and online document has been viewed by the researcher for the selection of study cases. All the interviews were conducted between 45 minutes to 1 hour and 10 minutes. The interviews were recorded along with the field notes. The next step was to transcribe the recorded interviews for analysis purposes. All participants were asked for interview recording and where permission was not given for that due to some personal reasons, the field notes were taken, and the interview was transcribed at the same time. These participants were followed up by phone and email for more clarity of ambiguous information.

The interview questions were constructed around the research themes that were identified during the literature review writing on eco-packaging or eco-innovation in packaging. The purpose of the opening interview questions is to get a sense of how significant and well-known eco-packaging is in the food and beverage industry. After that, the questions are based on major themes: major drivers for eco-packaging adoption, eco-packaging innovation features

important for the food and drink sector, and the impact of eco-packaging innovation (waste reduction, green image, green advertisement, green labelling).

These themes are based on the existed gaps in eco-packaging or eco-innovation in packaging literature regarding the adoption and impact of eco-packaging innovation from the managers perspective. During the interviews, the interviewer also observes the body language, voice intonation, and way of answering questions of the interviewee. The main reason behind this act was to understand the most important factors for eco-packaging adoption from the emphasizing tone of the interviewee.

Since every participant in this study was a native English speaker, interviews were held in that language. To avoid any biases all the questions are naturally asked by the researcher without any interpretation as the interviewer was only a medium of exchange for the interview questions (Irani et. al., 2002). The response biases are also curtailed by getting the respondent's consent for sharing his information and responses in the study by keeping his identity anonyms (Saunders et. al., 2016). Every interview is a part of the data set collected to develop the study themes to contribute to the existed literature.

Table 5.7: Interview Participants

Serial No.	Cases	Participants	Job Title	Age	Gender	Time at company
1	Case A	A1	Research and Technology Manager	30-40	M	5 years
2		A2	R&D manager	45+	M	15 years
3		A3	Innovation Manager	30-40	M	10 years
4		A4	Marketing Director	30-40	F	8 years
5		A5	Marketing Manager	40-50	F	6 years
6		A6	General Manager	40-50	F	5 years
7	Case B	B1	Marketing Manager	50+	M	23 years
8		B2	Marketing Director	30-40	M	5 years
9		B3	Retail Manager	40-50	M	9 years
10		B4	Research & Technology Manager	30-40	M	7 years
11		B5	Environmental Manager	30-40	F	6 years
12		B6	Packaging Developer	40-50	F	16 years

13	Case C	C1	Innovation Manager	40-50	M	15 years
14		C2	R&D manager	45+	M	10 years
15		C3	Marketing Manager	30-40	F	8 years
16		C4	Innovation manager	40-50	M	15 years
17		C5	Package Development Manager	30-40	M	7 years
18	Case D	D1	Research & Technology Manager	30-40	M	5 years
19		D2	Marketing Manager	40-50	F	6 years
20		D3	Innovation Manager	40-50	M	13 years
21		D4	Retail Manager	30-40	M	8 years
22		D5	General Manager	40-50	F	10 years

For triangulation purposes, the researcher also read business strategy-related documents for all cases to have an idea about business value, vision, culture, future aims, and commitments. All this data helps the interviewer to add in during the interview where it is of utmost necessity (Irani et. al., 2002). Details on each of the four case study businesses that were chosen for the research's data gathering are provided in the section that follows. From an environmental standpoint, each of these businesses has modified their packaging.

5.5 Case A

Case A is a multinational food and drink company. They expand their business through the acquisition of different food and drink brands. It has one of its foreign offices in the UK as a part of its business growth strategy. Now it has its factories in many countries around the world and is selling its products in almost every country. This company is intensively using its business managers for its country-based operations as they have a better idea about their country and strategies that can be good for it. Many managers have been promoted to other countries to expand sales and bring a better working environment to those countries.

Research and development and innovation is the main area of focus for this food and drink company nowadays. They have a worldwide research and development initiative budget that is used to establish different research and development groups for bringing innovation to the company. Globalisation is the main strategy of the company for its growth all over the world and is selling its brands with the same name in different developed and developing countries.

Following the sustainability initiative and promoting sustainable packaging this company has aim to make 100% of its brand packaging recyclable and reusable. Investing \$30 million in different strategies for sustainable packaging has promoted the use of refillable and recyclable paper food packaging.

The firm is actively working to minimise the amount of product packaging as part of its commitment to the environment, with the goal of having zero packaging effect on the environment by 2025. Currently, they aim to increase the recycling process and aid the consumers in recycling, eliminating the packaging where it is possible and using recycled materials for packaging to stop deforestation activity. The packaging materials of its products are made of natural resources that have biodegradability features. It commits to waste free future and therefore, it is addressing the waste issues around the world where it has factories and plants. Of its three main strategic plans, the first one is the introduction of new environment-friendly packaging. In the UK, this company has introduced recyclable paper wrappers, single material pouches, and Polyethylene terephthalate for many of its food products.

According to the company website they are recycling 75% of their packaging waste which consists of glass, metal, and paper-based packaging materials. elimination and optimisation are two main goals of the company in the UK to contribute to environmental protection. Some of the product's shapes are changed to redesign the packaging. This new packaging is using fewer materials and needs less space to transport from one place to other. Education to consumers for easy recycling of packaging waste is another big aim of the company. Public-private partnership is also on the papers for packaging waste recycling. Packaging design is improved continuously by using research and technological innovation by the company.

The company is also working on designing mandatory working and implementable an extended producer responsibility scheme for a waste-free future. To prevent landfills and dumping in oceans it has co-operations for its packaging waste collection and processing. For waste prevention, it has many future projects on eco-design innovation for packaging so that there will be less food waste and packaging-related environmental problems. This company is also a member of the UK plastic pact.

5.6 Case B

Case B is also a multinational fast-moving consumer goods (food, homes, and personal products) company with one of its head offices in London. It is the 23rd largest food brand in

the UK with 95% of shares in the hot snacks market. It has its business operations around 100 world countries. It has a wide variety of products around the world. It has its aims to double its business size by addressing social and environmental issues linked with the consumer goods market. It has decreased the energy consumption in its working plants along with a reduction of paper consumption in its offices to decrease waste and promote reusability and recycling habits. The company has committed to stop using plastic as packaging material for its brands by 2025. It has already replaced tonnes of its packaging material with recycled plastic around the world.

The company has started working on a post-consumer recycled plastic scheme and decreased 10% of its plastic packaging footprints around the world which is expected to increase up to 25% in 2025. It has introduced new recyclable paper-based packaging for some of its food items to save 4,500 tonnes of plastic every year. The work on refillable and reusable packaging is in the learning phases to replace plastic bottles with these different reusable and refillable bottles. It has its strategy for waste in developing countries as well, where different strategies are planned for the collection of waste generated by the company to recycle, reuse, and dispose of it properly. The company initiative is to finish the throwaway culture that is dangerous for our planet, and this will also help to stop using plastic for a successful transition into the circular economy.

It has decreased the dosage of its products as compared to other companies to reduce or less use of packaging which is leading to less water usage, less waste, and less use of resources. One of its brands has introduced replaceable parts for personal products so that consumers did not require the throwaway whole product instead of that half, part is replaceable for less plastic waste. Many other brands (same company) plastic packaging is replaced with recycled plastic jars and bottles, locally sourced recycled plastic, food-grade recycled plastic, and recycled materials to decrease carbon footprints around the world. In many countries, the company has invested in partnership with waste collection companies to collect the waste for proper recycling as a part of its extended producer responsibility for its waste by paying itself directly for it. With the help of google Maps, the company has introduced a platform that anyone in his country uses to find the waste bank location near him, where he can sell waste (deposit refund system).

In 2019 the company has introduced its very first reusable and refillable packaging in UK and Brazil for the consumers to use the same bottles again instead of throwing them in the garbage and buying a new one. This act is decreasing almost 200 tonnes of plastic bottle waste in these

countries. It has also a partnership with UK plastic pact. As this company has already changed its packaging material from plastic to recyclable and other eco-friendly materials so this company will help to understand the driving factors behind this adoption and its impact of it on the company.

5.7 Case C

Case C is one of Europe's largest food companies with diversified food, ingredients, and retail business in many countries around the globe (Europe, southern Africa, the Americas, Asia, and Australia). like the other two companies (Case A and Case B) it is also a member of the UK plastic pact. It has five business branches including grocery (food brands). Sugar, Agriculture (agri-food products), and fashion. The company has its sustainable development company goal which is innovation in food packaging technology for less packaging and less food waste. the recent innovation change in the company was to use renewable fuel, turn waste into packaging materials, and change non-reusable or non-recyclable material waste into composting (soil food).

The company has a zero waste to landfill ambition for 2025 and it is working with local recycling companies to recycle their waste. For that investment has been made by the company in training, technology, processing, and physical segregation initiatives. This investment is helping to reduce 25% of its greenhouse gas emissions. The company is committed to innovating its packaging to reduce plastic waste and landfills. For one of its business branches, the company is using cardboard beverage cartons and recycled paper bags as a part of its sustainability program.

The beverage cartons are using polyethylene, Polyethylene terephthalate (PET), card, and aluminium (thin layer). They are recyclable but their recycling process is not as simple as aluminium or glass. The company is investing in research, technology, and employee training so that they can successfully adopt the environmental change in the packaging. The company is claiming the recycling of its waste globally, but we cannot confirm exact figures for its waste recycling in the UK. Most of the UK's plastic waste is sent to other developing countries where recycling cost is low.

The company has decreased 5% of packaging waste across all its businesses. According to the company report, they are reluctant to use bio-based packaging materials as they can come into direct contact with food that can be dangerous for human health, but they are collaborating with their stakeholders for a proper recyclable plastic circular economy infrastructure. To fulfil the

commitment with the UK plastic pact for finishing the single-use plastic (PVC and polystyrene) the company has changed 30% of its packaging into recyclable, poppadum packaging, and reusable or compostable. After achieving 100% recyclability in the packaging (in 2025) the company will start working on shrinking its labels to decrease waste created by labelling.

Collaboration is the biggest strength of the company. Partnership with the research companies to understand innovation in packaging and understanding the recycling process. Partner companies are also helping in the process of waste collection for company C. The collected waste is separated between recyclable and non-recyclable and then recyclable packaging waste is recycled to use again as raw material for new packaging. According to the company's annual report, their new eco-friendly packaging is transit friendly. Similarly, secondary packaging is also educating buyers about the renewability, recyclability, and reusability of the packaging to create brand love.

5.8 Case D

Case D is also a multinational company with many foods retail stores around the UK, it is branding around the globe. As a part of its plastic-free future strategy. the company has introduced paper bags, paper laminate bags, paperboard pots, and new recyclable carton packaging for its label brands. It has also committed to stopping using plastic for packaging completely by 2030 and aims to zero carbon by 2042. As it develops a new business model and forms new partnerships to reduce all sorts of waste as part of a sustainability plan based on the UN's Sustainable Development Goals, the firm is also dedicated to decreasing food and packaging waste in its operations by 2030.

This company is using recycled plastic (rPET) as its drink packaging. This change in the packaging will help the company to reduce its greenhouse gas emissions. The company is soon starting a project to collect as much of its packaging waste as it can covert and reuse them as raw material. Company D is an active member of plastic pact UK therefore, it is working on building a proper recycling system that can be used to recycle plastic consistently. The reduced plastic and plastic-free new paper packaging are on trial at around 35 stores in the UK. There are many other packaging options including paper-based trays and water-based coatings. paper packaging without any plastic film is in their experiment stage to be used as brand product packaging.

The recycling bins are also introduced inside the stores to collect recyclable packaging waste from the customers who are unable to recycle at home. The customers can bring carrier bags,

food products bags, drink bottles, and magazine wraps to throw in these in-store bins. They can also give their feedback on this approach to the company. The data of this collected waste is also gathered by the company to introduce a deposit refund system as a waste management strategy by the company.

By emphasising waste reduction, encouraging package reuse, and boosting recycling of packaging waste, the firm is dedicated to minimising its environmental effect. Company D is working on a scheme like a deposit refund system but in this strategy, they are planning to give discounts to the customers who are buying and returning reusable cups, boxes, and bottles to the store. In the UK. Similarly, a new straw less lid box design is introduced by the company for some of its juice drinks that did not require plastic straws. With millions of investments, this strategy is on trial at specific places.

The company pledged to be transparent about its packaging material reduction and reusable packaging goals. This process of changing single-use packaging to eco-packaging innovation adoption was started in 2018 and now the company is claiming that about 70% of its product packaging is recyclable, compostable, and recollect able packaging. The use of paper is sometimes creating backlash by the customer specifically for liquid products as the paper did not have long usage life and if not handled with care can create problems for the customers. For instance, paper straws and paper bags are annoying many customers as they need something that can stay wet for a long time without being destroyed. The company is investing in the research of other materials that can be combined with paper and have easy recyclability along with no hygiene issues to solve this kind of problem.

As a multinational company there are some projects based on packaging waste management that are working in developing countries as well. For the corporation to apply the same policies in developing nations as it has in developed countries, there are obstacles created by a lack of environmental legislation and environmental education, but for that to happen, the people living in those countries need to be educated regarding waste management. To solve this issue company D is using advertisement as an educational platform to create awareness among consumers along with improving its green image.

5.9 Data Analysis

There is defined by Yin, (1989; P.105) as the “*examining, categorizing, tabulating, or otherwise recombining the evidence, to address the initial propositions of a study*”. Theoretical claims and conceptual frameworks aid in the researcher's ability to concentrate on certain data

sets and carefully plan out his work according to his unit of analysis (Yin, 2009). The first step of this process is data transcribing from the interview recordings (Saunders *et. al.*, 2009; p.485). In addition to analysing the participants' spoken words, data transcription also considers their vocal intonation. NVivo 12 was then employed for this data analysis procedure, which followed the usage of CAQDAS software.

Beginning with the analytical approach of what should be analysed and why should be done, qualitative research (including case study) should always be conducted (Miles and Huberman, 1994; Silverman, 2005 and Yin, 2009; p.126). There are six commonly used qualitative data analysis methods named qualitative contents analysis, narrative analysis, discourse analysis, thematic analysis, grounded theory (GT), and interpretive phenomenological analysis (IPA) (Braun and Clarke, 2006). All these analyses have their own strengths weaknesses and usage according to the study. Qualitative content analysis is mainly used to transform large verbal interviews or qualitative raw data into a systematic summary (Erlingsson and Brysiewicz, 2017). Similarly, narrative analysis is also used to analyse verbal data by summarising it into meaningful words, themes, or categories. The main difference between qualitative content analysis and narrative analysis is that qualitative content analysis can also deal with non-verbal data that narrative analysis cannot do (Smith, 2000).

Disclosure analysis helps researcher to understand the participant's words closely. Since how he explains the facts in his words and what kind of shared relationships, identities, and meanings are created from his given information. Grounded theory is mostly based on open, axial, or selective coding for cross-examination of the concept's dimensions and properties. This process helps the researcher develop an integrated explanatory framework to categorize the concepts. The phenomenological analysis is used to identify phenomenal descriptions to cluster them together into separate categories. These categories explain the commonalities and essence of the experience (Starks and Trinidad, 2007).

To find, analyse, and report various patterns, the thematic analysis method comprises the description and interpretation of the data, the selection of codes, and the development of themes (Braun and Clarke, 2006). This case study has adopted a thematic data analysis process as it is considered suitable for this type of research (where we are examining behaviour, experiences, and beliefs through data sets). As a first for thematic analysis the collected interview data was transcribed and initial codes were generated. After that themes and sub-themes, were searched and generated as categories based on the objective of this study and research questions. NVivo

12 software was used for these identifications and the data analysis. Thematic analysis is further explained in the following section.

5.9.1 Thematic Analysis

Since thematic data analysis is an adaptable qualitative data analysis technique that may be employed within many paradigmatic or epistemological research contexts, this study is employing it to uncover themes (Nowell et al., 2017). Braun and Clarke, (2006; p. 79) describe it as “*a method for identifying, analysing, and reporting patterns (themes) within data*”. The simple framework that is used by many researchers for conducting thematic analysis consists of a six steps process. this systematic process is not strictly linear as the researcher must go back and come forward during the thematic data analysis process for rigorous and reliable findings. The identified themes relate to the research questions to find meaningful data as the response of the participant.

Data analysis involved conducting, recording, and transcribing semi-structured interviews. Data transcription entails listening to the interview audio and precisely transcribing information into word documents for subsequent processing. As the recording is listed several times, this procedure aids the researcher in developing a deeper understanding of the data. To ensure that every interview is correctly transcribed without any errors, the recording is listened to and reviewed several times. A description of the many stages of theme analysis is provided in the table below (Braun and Clarke, 2006).

Table 5.8: Stages of Thematic Analysis

Phases		Phases Process Description
Phase 1	Familiarising yourself with data and writing familiarisation notes	-Transcribe Data -Reading data and re-read it again -Writing first draft of codes, emerging themes, and theories -Data, field notes, and documents organisation for record
Phase 2	Generating initial Data Codes	-Coding relevant features of data in a well-designed systematic way -Collecting codes data -Built Coding framework
Phase 3	Generalising initial themes from coded and collated data	-Arranging Codes into possible themes -Collect and arrange data in each theme
Phase 4	Developing and Reviewing Themes	-Develop Sub-themes and evaluate the relationship between themes, sub-themes, and codes

		-Create a Thematic map for analysis
Phase 5	Refining, Defining, and Naming themes	-Refine the specifics of different themes -Built an analysis-based information story -Write definitions and clear names for each theme
Phase 6	Writing the Report/Manuscript	-Selection of concise, captivating extract examples -Evaluation of chosen extracts -Connecting the findings to the research question and literature -Creating an academic report
Source: (Braun and Clarke, 2020)		

According to Zhang and Wildemuth, (2006) during data transcribing three main questions should be answered by the researcher. 1) The researcher should transcribe all interview questions, or he should only focus on research questions? 2) Should it be a verbatim transcription or instead of that it should be transcribed only as a summary? 3) Is there any need to transcribe all non-verbal information (sounds, delays, etc.) or not? The researcher made the decision to record every interview question precisely to ensure that all relevant material could be used in the study when it was required, keeping in mind the aforementioned queries. After that, all data was reviewed and incomplete sentences with pause, delay, and sound disturbance were deleted. All participant interviews were converted into separate files for NVivo analysis. For keeping internal validity, the transcribed data was reviewed by a supervisor, academics, and some experts to remove any bias in the data.

The second stage involves creating basic data codes based on theoretical, conceptual, and existing literature on eco-innovation and eco-packaging. According to Zhang and Wildemuth, (2006; p.3) *“the researcher might assign a code to a text chunk of any size as long as that chunk represents a single theme or issue of relevance to the research”*. Coding is explained as a *“critical link”* between collected data and its explanation (Charmaz, 2001). There are two cycles of coding First Cycle of coding can consist of a single word, a full sentence, an image, or a full page of word sentences. On the other hand, Second Cycle coding is applied to the same units, long textual passages, or reconfiguration of already existing code itself (Saldaña, 2013).

The researcher used both coding cycles as the First Cycle coding is used for the first phase of data analysis and the Second Cycle coding process is used for the second and third phases analysis. To create and refine theoretical themes descriptive codes and In Nvivo 12 coding methods are used by the researcher. Descriptive coding is a First Cycle method that is often

used in research to describe data passages according to the study topic by using descriptive nouns (Onwuegbuzie et. al., 2016).

Similarly, In NVivo12 coding is used in qualitative data analysis that gives importance to the actual wordings of the interviewee. This type of coding is very useful in research to highlight the words and phrases of participants specifically used to give answers that may not be explained by any other coding (Miles et. al., 2014, p. 74). In NVivo coding is popular as compared to others as it highlights the exact wordings and the way it is said by the participant to give importance to the data (Manning, 2017).

The researcher used theoretical concepts, themes, and conceptual frameworks that emerged from existing literature review to release the list of codes for First Cycle coding. A deductive or concept-driven coding approach is used to generate descriptive codes for the first cycle of data analysis (Miles et. al., 2014). These types of coding help the researcher for generalisation across study cases (Rowley, 2002). These initial codes given to interview transcriptions were again reviewed by the researcher and supervisor and renamed.

The third step is to search themes from the data and collated themes and codes simultaneously based on their similarity among them. The Second Cycle coding process was used to achieve the best results in this third phase of thematic analysis. In Second cycle coding researcher may collapse first cycle codes into smaller numbers as he may find one word best suited for different smaller codes. Pattern coding is used in this second cycled coding process by the researcher. Pattern coding is often used as prominent coding in the second cycle that helps a researcher to develop a meta-code as the label for the same category of data. Thus, pattern coding helps a researcher to organise the corpus and provide meanings to the attribute (Saldaña, 2013). According to Miles & Huberman, (1994; p. 69) "*Pattern Coding is a way of grouping those summaries into a smaller number of sets, themes, or constructs*". After codes, their sub-codes were also generated based on theoretical categories identified by the researcher. These new sub-themes (sub-codes) are identified after carefully reading line-by-line interview transcripts (Bryman and Bell, 2007).

Instead of evaluating an existing theory, to see whether it is correct or describing an already existing occurrence, inductive coding is appropriate for studies that aim to build new theories. Some research that has their existed preliminary theory or model can categories initial coding from the already existing model. This already existing theory can be modified inductively during data analysis when new themes emerged from the collected data (Miles and Huberman,

1994). This inductive approach is used by the researcher to generate sub-themes (sub-codes). After this inductive approach, the deductive coding technique was used to refine, expand, and improve existing coding with new emerging themes and codes in the second cycle (Linneberg and Korsgaard, 2019). So, the researcher used both inductive and deductive coding approaches to identify themes and sub-themes and the relationships among them.


After this in the next stage number four, thematic analysis has been done on coding data. Based on the study themes and sub-themes data is distributed into codes and sub-codes and extra codes are added to their relevant codes (themes). Some extra codes were not a part of this research those codes are arranged into a separate code-named unused. Some other code wordings were changed according to the research framework and the meaning concluded from the data. These nodes and sub-nodes are described in appendix V. The basic codes are knowledge and awareness for eco-packaging in food and drink companies, external drivers, managerial environmental awareness, eco-capabilities, the impact of eco-packaging adoption, and waste prevention.

After thematic analysis at stage five, simple wordings were assigned to the convoluted themes. This is done so that the node representing the theme, explains it in a very simple, easy, and understandable way (Braun and Clarke, 2020). Sub-themes were also re-worded to connect them with the main study themes. After this step analytic memo was re-examined by the researcher. The term analytic memos are the codes or themes that inspired the researcher and he used to keep records of these newly emerged data, themes, propositions, relationships, and categories to compare them with theoretical memos at a later stage (Saldana, 2013). In this research, these analytic memos are collected as separated nodes to draw a relationship between these new memos and theoretical nodes for revising the theory in a better way. By reviewing the analytical nodes, nodes and sub-nodes researcher compare all the cases to explain the relationship between all the themes and newly emerged themes in revised framework.

In the last stage of NVivo qualitative thematic data analysis, all themes were reviewed for the last time to organised them from the perspective of the research framework and research questions. Within-case analysis and cross-case analysis are offered in two different chapters in this case study research (Yin, 2014). The data analysis is represented in form of different display formats including matrix display, charts, and analytic diagrams of first and second cycle codes from the data (Huberman and Saldana, 2014; Yin, 2014). Following table is explaining the process of using NVivo for qualitative data analysis.

Table 5.9: Stages and practice steps involved in the application of NVivo for qualitative research.

Analytical Process	Application of NVivo	Strategic Aims	Analysis process iteration
Data Familiarisation	Open Coding	Data management (Descriptive Stage) Open and hierarchical free coding of raw data through NVivo This process was exploratory, and participant led.	Assigning data to codes to capture units of meaning. (Deconstructing data from original chronology to initial, non-hierarchical codes). ↑↓
Thematic Framework Identification	Categorisation of Codes and Propositional Statements	↓	Reviewing, refining, merging, renaming distilling and organising open codes into broader categories of codes ↑↓
Indexing	Coding on	Data Interpretations Re-ordering, “coding on” and annotating through NVivo. This process involved interpretation so was both participant and researcher led	(Reconstructing open codes into a framework to answer the study's objectives and research questions). ↑↓
Charting	Triangulation with Key Informants and Conceptual Mapping using NVivo	↓	Conceptually mapping and collapsing categories to a thematic framework. ↑↓
Mapping and Interpretation	Analytical Memos and Abstraction of Data	Explanatory Accounts – data abstraction Extrapolating deeper meaning, drafting summary statements and analytical memos through NVivo. This process moved analysis	↑↓

		<p>from the specific to the abstract and was researcher only led.</p>	<p>Systematically reviewing thematic framework using analytical memos</p>  <p>Synthesising analytical memos to cohere and report findings</p>
<p>Source: Adapted from Richie & Spencer (1994); Bonello and Meehan, (2019)</p>			

5.10 Approaches to guarantee trustworthiness in qualitative Research

The researcher is following the procedure and rules of trustworthiness described by Lincoln and Guba, (1985) and Zhang and Wildemuth, (2006) to confirm the validity and authenticity of this qualitative study. Credibility, transferability, dependability, and confirmability are the four commonly acknowledged standards for the trustworthiness of qualitative research since they are seen as a replacement for internal validity, external validity, reliability, and objectivity (Lincoln and Guba,1985). Each of these is significant and must meet specific standards in order to guarantee the accuracy and reliability of the study.

5.10.1 Credibility

Credibility is the truthfulness of the research that whether the research findings and conclusion are credible. To achieve credibility, the researcher should be equipped with all necessary knowledge about the research participants, and he interprets all data inclusively. One method to achieve this type of credibility is to recheck all data with the research participants by sharing it with them and getting their review to see if they agree with it or not (Lincoln and Guba,1985). Another method to access credibility is data triangulation.

Triangulation refers to the collection of data from different resources, using different collection methods, or getting different documents or explanations for the data. In this research, data triangulation is done by collecting semi-structured interviews, getting online available

company documents, and observations (Saunders et al., 2009). As it is very important to ensure that respondent is saying the same that the researcher is observing, and company documents are explained. According to Yin (2009, p.103) “*documents play an explicit role in any data collection in doing case studies*”. To achieve this credibility initial codes were reviewed by the supervisor during the data analysis phase and the back-and-forth process was used during coding and writing conclusions.

5.10.2 Transferability

The next principle is transferability which is linked with the applying research findings and interpretations in different research contexts. In simple words, the researcher is required to provide wide descriptions and research is applicable in another context with a smaller change in the research model. It put the responsibility on the researcher to provide rich descriptions for his conclusions so that if any other researcher wants to apply it in different settings, he will be able to do it by easily understanding the research result explanations (Zhang and Wildemuth, 2006). It is the direct synonym of generalisability in quantitative research but as in qualitative research the study sample is often small size, therefore, it is impossible to represent the whole population as quantitative research can do. Therefore, Lincoln and Guba, (1985) emphasize providing deep details and thick descriptions that although it is not generalizable if the reader wants to replicate it in a different case, he can do it.

5.10.3 Dependability

The third condition to be fulfilled is dependability which is referred to as reliability in quantitative research. It has to do with the accuracy of the research methodology and the dependability of the tools or measurements used to collect the data. In qualitative research, dependability refers to the same interpretations by different people. In simple words, the research procedure and results should be explained in such a way that if any other person analyses research data he should reach the same conclusions as the researcher conclude. For that researcher must document all his research steps, activities, changes, and conclusions. The researcher can get a review of other researchers to evaluate the accuracy of his results and to understand how accurately he explains the study results from the obtained data.

5.10.4 Confirmability

The last principle for the trustworthiness of qualitative research is confirmability. It is the same as objectivity in quantitative research. In practical usage objectivity in terms of quantitative research disassociate the researcher from the research data and contrary to that, qualitative

research requires deep associations between data and researcher and attention to details from the researcher during data descriptions. To achieve confirmability researcher can keep an “audit trail” by keeping a record of all his justified steps and explaining the decision taken by him during coding and data analysis (Nassaji, 2020). The following table is explaining all the necessary steps and strategies adopted by the researcher to validate and verify the research.

Table 5.10: Ensuring trustworthiness in qualitative research.

Criteria	Strategy	Approaches adopted by the researcher
Credibility (Lincoln and Guba, 1985)/ Validity (Yin, 2014)	Triangulation Respondent Check Investing sufficient time Persistent Observations	Data collection from different sources (different types or levels of employees), Method triangulation (different methods for data collection), and investigator triangulation (using one or more researchers in coding, data interpretation, and analysis process). Interviewer and participant bias was also avoided by using the common method (Feedback, interpretations by respondents) Devoting enough time to maintain the necessary level of clarity in the data collecting and analysis process. Focus on important study elements, problems, and their details
Transferability (Lincoln and Guba, 1985)	Thick Descriptions	Describing the context of the behaviour and experience of the interviewees, so that will be valuable for the reader. The literal replication logic method was used to select study cases for analysis (Yin, 2014)
Dependability (Lincoln and Guba, 1985)/ Reliability (Yin, 2014)		A complete Case study protocol explained by (Eisenhardt, 1989 and Yin, 2014) was followed by the researcher. The coding process is given in detail and kept transparent for others. Interviews and documents were kept in record to review repeatedly
Confirmability (Lincoln and Guba, 1985)	Audit Trail	All evidence including interview recordings, field notes, coding frameworks, findings, and conclusions were retained
Construct Validity (Yin, 2014)		A comprehensive literature review was used to develop concepts, propositions, and relationships for eco-packaging

5.11 Avoiding Interviewer and Participant Bias

To avoid interviewer bias during the interview's interviewer stayed neutral by not adding any comments during interview questions. The interviewer prepares himself before an interview by reading interview questions clearly in front of some colleagues. Answers were listened to and recorded attentively without the creation of any tension or problem in the atmosphere during the interview. All interview questions were also written in simple English to avoid any words that can create bias.

Participant bias is avoided by writing all questions as open-ended questions, so that the participant prevents from responding as yes/no or agree/disagree. The interview questions were phrased in such a manner that the respondent feel it was simple to give his truthful and accurate response to the question based on his knowledge and experience. Indirect questions addressing any third person were strictly not included in the interview. To keep engaging the respondent throughout the interview, every question was phrased by using different wordings. To interview neutrality was maintained by the interviewer so that it will not affect the interviewee's response. All respondents' details and company information will be kept confidential, and interviews were scheduled on the agreed time and duration between the interviewer and respondent.

5.12 Ethical Consideration

The research is conducted by following ethical guidelines given by Newcastle University. An ethical research form was filled out by the researcher according to the university regulations regarding field research and survey and the approval was taken by the university months before starting the actual interview process. All research participants were also given an ethical consideration form so that they know their data privacy and research objectives. This form contains the information that this research is specifically academic, and the information of research participants will be kept secret without any disclosure of their details or organisation name where they belong to. The researcher forms an interview guide for the participants so that they have basic knowledge regarding this research before the interview. The interviewees' consent was obtained before the interviews were taped, and the researcher also took field notes.

5.13 Conclusion

This chapter explains the specific steps, the research design, and the research technique that were utilised to achieve the study's goals and answer its questions. Due to the nature of the research, which involves many case studies, qualitative data in the form of interviews are gathered for four cases/companies. To gain a thorough understanding of the study questions, all interviews were semi-structured. NVivo 12 is also used to analyse the interviews via coding. The data triangulation method was also used to cross-check the research data and findings.

Researcher Reflexivity

Reflexivity means explaining the relationship between researcher and his work (Brannick & Coghlan, 2006). According to Willing, (2013) reflexivity can be explained in two ways: researcher's personal reflexivity and epistemological reflexivity. Epistemological reflexivity defined as corresponds to the assumptions made concerning our environment and the understanding gained as an outcome of research. It also includes answering the research related questions like what will be outcome of proposed study? Research can be conducted in any other way or not? How data will be collected, and findings will be explained by using specific research methodology and research analysis?

As a researcher I believe that research participants are the best narrators of their own life experiences based on their age and time spent within this world or an organisation. Their experience can differ from person to person based on their own personal circumstances that may not be aware off. Epistemological reflexivity is explained in the research methodology chapter in detail. Here I will explain my personal reflexivity as a researcher in relation to this study.

I write my research journey in form of reflexive diary. This diary was always with me during interviewing process as I was aware of my struggle as first-time researcher interviewing experienced company employees from different cultural backgrounds. Me and my supervisor discuss my interview style as I must focus on my English accent as I need to conduct interview in English that is not my first language. So, I keep myself organised to record everything so during transcription process I can cross-check to not miss anything. It was important for me to discuss every interview with my supervisor so that she can have an idea about my communication style and the information I received from the research participant.

Throughout interviews I came across new learnings and experiences. I connect with many managers and their journey within the company they are working for. It was my very first research that was qualitative so at earlier stages I was not so much confident about myself as an interviewer. But this qualitative research boosts my confidence and improve my way of communication especially with the managerial level people. Sometimes cross-questioning about waste management policies with developing countries (my home country) distract me from the aim of the research interview but most of the time I kept myself disciplined and focused on the research aim. So, I learn to focus on the specific knowledge, idea, or experience that I want to hear about instead of distracting from the cross-questions by the participants. I

clarify interviewees if I thought I misunderstood them or did not hear them properly. I learn about new ideas, reforms and changes that added into my knowledge about the specific area of research.

After this research experience I am aware that a researcher should be neutral (although he/she has previous knowledge about the study). I kept my views, opinion, knowledge, and my facial or verbal reactions hide so that I can listen and understand the interviewee's experience and knowledge. From this practice I learn patience, and gain ability to listen others by keeping myself in control. I was in advantage as my research participants were not from my own community, country and were not personally related to me.

Overall, I learned a lot about research methodologies, communication styles, listening by focusing on the speaker, importance of experiences to bring change, and how to get validity and empathy in strangers mind for yourself. Literature review writing and gathering relevant research was a very difficult and challenging part of my journey as a PhD student. As this area of research is not so much explored therefore it was very difficult to find relevant articles on it.

CHAPTER 6

WITH-IN-CASE ANALYSIS

6.0 Introduction

The four businesses selected for this study's with-in-case analysis are explained in this chapter. All four companies are at different levels of adoption of eco-packaging. Some of them are using zero plastic by replacing it with biodegradable and recyclable materials and some of them are still at the initial stages of adoption where they are using environmental packaging materials for selected products to observe the impact of that change in packaging on their expenditures and sales.

The major themes for the representation of the adoption of eco-packaging in this research include drivers for eco-packaging adoption-external drivers, managerial environmental awareness, eco-capabilities, eco-packaging adoption process, and impact as green marketing. These were specific similar themes in each case but along with those different other themes that may vary in each case, they are containing important knowledge are also included in this study.

Each case is representing individual findings thematic analysis, and themes identified by the literature review, based specifically on that case. Each case is also representing theoretical propositions developed in chapter 3 based on a theoretical framework derived from a literature review. Every with-in-case analysis contains a summary of that case at the end to explain the case findings concerning research constructs external drivers, managerial environmental awareness, eco-capabilities, eco-packaging, and green marketing.

6.1 CASE A

Company A is the oldest international food brand in the UK. The adoption of environment-friendly packaging as a business strategy is in its final phase for company A as they have already changed the packaging for most of its food and drink products. Company A is also getting customers' opinions on the new packaging materials to improve it by incorporating

demanded characteristics in it that will lead to an increase in their sales by increasing the number of loyal customers.

6.1.1 Understanding, Awareness, and Importance of Eco-packaging

Company employees are showing understanding of the environmental packaging materials and their benefits for everyone including customers, brands, the environment, and the future generation. Eco-innovation is considered an essential part of sustainability practices by the company employees. One of the research and development managers in company A create its link with corporate social responsibility and extended producer responsibility for packaging laws around the world emphasizing the producers to take the responsibility for the waste created by their product packaging and to decrease this waste eco-packaging is one of the best available solutions. One of the innovation managers in company A explains that.

Participant A3: “The debate for using more sustainable or environmentally friendly packaging material was started many years ago in form of corporate social responsibility, extended producer responsibility, sustainability practices, and now if we specifically talk about responsible packaging then it also helps in waste management, circular economy, and zero waste strategy” (Innovation manager of company A).

Another market development manager confirms that food and drink companies are adopting more environment-friendly packaging materials nowadays. It means there are enough data, knowledge, and eco-materials that should be available in the market to eliminate the use of plastic.

Participant A1: “Different food product companies are moving towards recycled plastic and paperboard packaging to show their concern and responsible attitude. There are many other new types of materials that are invented in laboratories to replace plastic, as they have biodegradability along with all other features that make plastic as favourable packaging material in past”. (Research and technology manager of company A).

Case study A employees are agreed that they are concerned about packaging waste and are understanding the importance of eco-friendly packaging materials therefore they are considering different new packaging materials based on their features as their food and drink packaging and it is also need of their business long-term future.

6.1.2 Types of Eco-packaging for the food and drink sector

Interview participants were questioned about the desired eco-packaging features/type that they think are crucial for the food and drink industry. Most of the participants from company case A shows the same level of understanding while answering this question as their defined features for eco-packaging were quite like each other. Many of the eco-packaging types are different from each other based on their raw material and manufacturing process. Eco-packaging features explained by the participants are also related to waste management i.e., recyclable, reusable, renewable, recoverable, etc. The following table is explaining the type of packing features that are essential for the packaging to be considered eco-packaging and based on these features can be adopted by food and drink companies.

Table 6.1: Types and features identified by Case A participants for eco-packaging

Participant	Reuse	Renew	Reduce	Recycle	Recover
A1	✓	✓	✓	✓	
A2	✓		✓	✓	
A3	✓	✓	✓	✓	✓
A4					
A5	✓		✓	✓	
A6				✓	

Participant	Paper Packaging	Metal Packaging	Edible packaging	Consumer-waste Recycled Packaging	Cardboard Packaging	Biodegradable Packaging
A1	✓			✓	✓	✓
A2					✓	
A3	✓					
A4	✓					

A5				✓		✓
A6					✓	

Most of the participants considered reuse, renew, reduce, recycle, and recover as essential features for packaging to be eco-friendly. None of the participants talked about edible packaging or metal packaging materials. These features are based on the knowledge of respondents regarding eco-packaging being used by the company or by the other companies in the food and drink sector. The participants from Case A did not consider metal and edible packaging as eco-packaging for their sector. They are using other recyclable eco-packaging materials as said by one of the participants:

Participant A3: *“We have introduced recyclable plastic for our product packaging. Some of our food items contain recycled cardboard packaging. we are trying to introduce plastic packaging substitute therefore we are using recycled plastic materials as our product packaging raw material”.* (Environmental Innovation manager of company A).

Cardboard is also used by the company A eco-material for packaging:

Participant A6: *“For some of the food items we have replaced plastic with cardboard paper packaging”.* (General manager of company A).

They have also introduced post-consumer waste recycled packaging and shopping bags by recycling the waste collected by the consumers.

Participant A1: *“We also offer a recyclable paper bag made from customers’ paper-based waste material – a unique offering in our industry”* (Research and technology manager of company A).

6.1.3 External Drivers for Eco-packaging adoption

The following figure is an evidence map to explain external drivers for the adoption of eco-packaging. Intriguingly, market expectations and stakeholders have emerged as new external driving factors.

**Table 6.2: Evidence Mapping for the External Drivers for Eco-packaging adoption
(Case Study A)**

Key findings Evidence for Case A	Second-Order Themes	External Drivers
<p>There is huge demand from the environment, and responsible consumers, for reusable packaging in the market as they are educating themselves for a better future for the next generation.</p> <p>The need for environmentally friendly packaging that has fewer negative impacts on the environment is partly driven by consumer knowledge of environmental concerns.</p> <p>People around the world are also aware of environmental degradation and deterioration of natural climate they are also demanding green packaging for products to reduce waste</p>	Customers Demand	
<p>Competitive pressure also existed in the market therefore to fulfil market expectations and to have a better image we are working hard on our eco-packaging adoption.</p> <p>Companies are establishing a competitive environment in this sector that urge other companies to do efforts from their side as well by improving their packaging, decreasing waste management cost, and improvement of their image in the sector.</p> <p>A competitive environment is also creating a fear of losing customers especially if you are not an early mover in the market therefore thinking about packaging recycling and sustainability is also to have a better image in the market and face tough competition.</p>	Competitive Pressure	
<p>Sustainability practices are also directing companies towards waste management and focus on extended producer responsibility. in terms of green packaging materials.</p> <p>Eco-packaging helps our company to fulfil waste management end extender producer responsibility initiatives.</p>	Environmental Regulations	
<p>Market expectations also come from new trends and competitors' policies regarding their waste</p>	Market Expectations	
Source: Derived from empirical data		

6.1.3.1 Competitive Pressure

The other businesses in the market have an edge over its competitors, which is pressuring the non-adopters to enhance their market presence and attract more customers. The existence of healthy competition for better packaging with environmental benefits is improving the creativity and exploration habits of the employees. This is confirmed by one of the employees working in company A:

Participant A4: *“This is the era of creativity and competition if your competitor is creative then it will be difficult for you to survive in the market as you will be unable to improve your image without a creative change”*. (Marketing manager of company A).

It did not only help firms to show as a responsible organisation but the adoption of eco-packaging as an early adopter is improving their image in the market. Everyone in the market is aware of the early mover advantages so the competition is creating an opportunity for all firms they can think out of the box for a creative eco-packaging introduction.

Participant A6: *“There is a healthy competitive pressure from the companies in the food and drink sector for eco-packaging. This pressure is encouraging other firms to move towards environmental practices”*. (General manager of company A).

6.1.3.2 Customers Demand

Taking everything that is said by interviewees into account, customers demand always has a big impact on the firm and market. The customers are educated and have concern for the environment that is prominent in their actions and behaviour. This is supported by the following information:

Participant A1: *“There is huge demand from the environment, responsible consumers, for reusable packaging in the market as they are educating themselves for the better future for their next generation. Some of the consumers use reusable packaging and reusable shopping bags for showing their concern for nature”*. (Research and Development manager of company A).

Another piece of information that is supporting this fact is quoted below:

Participant A4: *“Customer is also a driving force but sometimes if they are brand conscious, they may not bother too much about the changes in the market but if they will be more knowledgeable and committed towards the natural environment that is the reality that they are,*

then it will be difficult for you to retain loyal customers without the adoption of eco-packaging". (Market Director of company A).

6.1.3.3 Environmental Regulations

Eco-innovation is the best solution for environment management-related problems and to fulfil the requirements of environmental regulations set by the government or regulation authorities in any country. Participant A1 explains extended producer responsibility as a driving factor for eco-design introduction in packaging. As extended producer responsibility law for packaging makes the producer directly responsible for his packaging waste and all emissions that are polluting the environment during packaging production. So, if the producer changes its product packaging from traditional to eco-friendly packaging it will benefit the producer in long-terms. Like this information, the other participant explained that:

Participant A6: *"The government regulation i.e., extended producer responsibility for packaging is increasing company costs to make it more responsible for packaging waste, this is resultantly increasing overall costs and demands for environment-friendly packaging materials". (General Manager of company A).*

An increase in the company cost because of environmental regulations is also supported by the findings from another interviewee:

Participant A5: *"Packaging waste is costing our business in form of government regulations regarding packaging waste disposal. Initially, it was the cost with packaging waste recovery note (PRN) and now it is named as extended producer responsibility for packaging". (Market Development Manager of company A).*

6.1.4 Managerial Environmental Awareness

6.1.4.1 Environmental Risk Awareness

One of the measures to estimate managerial environmental awareness is risk awareness the manager can evaluate the risk that a company has if it has no future for eco-innovation adoption. Managerial knowledge regarding environmental legislation and his awareness about the risk that his company must take if they are not making policies from the environmental perspective. One of the interviewees explains this in the following words:

Participant A5: *"Manager has exact knowledge for his department, and he plays his role very intelligently in the decision-making process. For instance, the manager knows the costs involve*

at different stages of production and he also has an exact idea of how a change at one place in the production process can affect the other stages. Therefore, he can discuss exactly the advantage and disadvantages of that change. When we decide to adopt eco-packaging packaging production manager was the first person to raise his concerns about the effect of the new materials at different stages of production. We adopt the eco-packaging after complete satisfaction that we can implement it very effectively and we will not regret on our decision in future". (Market Development Manager of company A).

However, some of the interviewees confirm that the manager is not the only person to be aware of the risks of not responding timely to the packaging-related environmental changes within the industry. Case A representative makes clear that:

Participant A1: *"The decision is not a one-person decision, it involves company CEOs, strategic management team, production manager, technology manager, and other highly knowledgeable persons to keep in mind marketing trends and then decide to switch or change the packaging. The benefits of eco-friendly packaging are far more than its costs as to stay in the competitive world it has become essential for everyone now to adopt eco-friendly initiatives in terms of eco-product and eco-packaging". (Research and Technology Manager of company A).*

Knowledge can also be linked with experience therefore one of the respondents emphasizes experience as well because experience always helps a firm to learn new things. The manager also uses the knowledge of his competitors to decide how he should respond to a suggestion, and it helps him to take wise decisions. This is quoted by the respondent as:

Participant A2: *"Knowledge and experience indeed are an essential requirement for taking responsible decisions. As there is too much pressure and competition in the market therefore knowledge about competitors is always an integral part of management decisions". (Research and Development Manager of company A).*

6.1.4.2 Environmental Benefit Awareness

Another significant factor in the uptake of eco-packaging is managerial understanding of the financial and non-financial benefits that a firm might experience with the use of eco-innovation. Mostly the benefits are financial profits or a decrease in costs for the firm after eco-packaging adoption. The manager often favours long-term benefits; therefore, he considers current investment in eco-packaging as a future monetary profit. He is willing to adopt eco-packaging for better future sales and revenues. This is justified below:

Participant A3: *“Manager is always the one who knows about his store/company costs, and it is his responsibility to stay knowledgeable about different cost reduction techniques that can benefit the company. In the same way, if he is concerned about an increase in cost that may have an impact on product price as well, he will be against that measure. For instance, if a manager knows that eco-packaging is costing more to the company in the short-run but in the long-run, it has profit and decrease in cost benefits also with the information that eco-packaging is need of time, he will go for it and will provide as much information as he can in favour to adopt eco-packaging”.* (Innovation Manager of company A).

Another participant from case A explains the cost and profit evaluation by the manager for eco-packaging adoption as:

Participant A4: *“It is a simple thing as we know that manager responsibility is to keep an eye on profit and costs, and our manager decides that in short-run maybe we are having an increase in cost after adopting eco-packaging but in long-run we will be benefited from this decision”.* (Market Director of company A).

One of the participants raises the question of the managerial knowledge of the company costs. According to him, the manager is not the right person to have all knowledge regarding different costs incurring in the company. Thus, cost and financial benefits are not completely covered by the manager when deciding to adopt eco-packaging.

Participant A6: *“If we think about finance, then it is a completely different department. But if we are talking about in general increase or decrease in sales then yes manager is knowledgeable about negative and positive changes in the sales due to changes in packaging. Manager can have general observations, but he cannot provide shot run and long-run comparison in costs for adopting green packaging”.* (General Manager of company A).

6.1.5 Eco-capabilities:

There are three main eco-capabilities are identified in the literature that has already been explained in chapter 2. The interview questions were based on these three eco-capabilities names technological capability, human capability, and research and development capability.

6.1.5.1 Technological Capabilities

The respondents from company A accept the fact that technological capabilities in terms of working with new innovative technology are very important for eco-packaging adoption. They said that:

Participant A1: *“We are also working on new smart technology available in the market that will help us to reduce our food waste by increasing its shelf life and timely warning of food expiry so that we can have proper arrangements for the consumption or disposal of that food”.* (Research and Development Manager of company A).

Participant A5: *“Technical changes include new improved technology to handle eco-materials and for eco-packaging production. This technical resource also includes technical knowledge and training to employees at every stage of its usage i.e., from raw material to the packaging making and its handling”.* (Market Development Manager of company A).

The introduction of innovative technology is also a prerequisite for handling new materials. As different materials need different handling and manufacturing processes before using them as a final product packaging, company A brings new technology as a part of its internal capability improvement.

Participant A4: *“Our company gets complete knowledge of responsible paper packaging raw materials availability to change some of our product’s packaging from plastic to paper packaging. After that, we bring some new machinery to deal with the handling of such raw material to make it a packaging for the product such changes come under technological resources”.* (Marketing Director of company A).

6.1.5.2 Human Capabilities:

In response to the question regarding human capabilities, many respondents talked about three aspects of employees’ health and safety, their training and knowledge as necessary eco-capabilities while they adopt eco-packaging.

a. Health and safety:

Investment for employee health and safety is important as they are intangible assets of the company and the impact on the health of employees can somehow affect the production and manufacturing process.

Participant A2: *“We invest in training for our employees on handling the new packaging materials, health, and safety when they are recycling the waste and now specifically tailored to support employees’ mental health and wellbeing during the COVID-19 outbreak”* (Research and Development Manager of company A).

Participant A3: *“They should have complete instructions for handling raw-material, health, and safety and how to use technical details for the eco-packaging production and usage”* (Innovation Manager of company A).

Employee health and safety are essential in terms of using recycled materials as well. In one of the cases A participants explain that:

Participant A5: *“Recycled raw material may have chemical substances that make it essential to use with necessary health and safety kit. Therefore, this training will decrease health and safety risks and incidents at the production and handling stage”*. (Market Development Manager of company A).

b. Employee training:

Training is part of the learning process and when new technology, manufacturing process, and any new change is introduced in the company, employees should be given training regarding that change, especially when it is related to handling new materials or using new technology. The interviewees explain this knowledge transfer as a part of firm eco-capabilities and eco-packaging adoption process. He explains that:

Participant A1: *“Training is a must, but we did not require complicated technology as our packaging is obtained from a different unit where packaging is specifically made for the brand. Our company has invested in apprenticeships and training for company employees so that they can become a part of our environmental initiatives”*. (Research and Technology Manager of company A).

Participant A4: *“Pieces of training are given to the staff before the adoption of eco-packaging so that they have complete knowledge of why and how we are changing our packaging materials”*. (Marketing Director of company A).

c. Employee Knowledge:

Knowledge is also a part of the training process. From the data, the interviewee advised that sharing every little information regarding change in packaging should be communicated to each employee working in the packaging department. The respondent believes that:

Participant A3: *“Eco-packaging based on recycling paper packaging will need delicate handling different technology or maybe we can use same equipment’s but need to change steps of the production process, thinking about storage space and how it will be used to package a*

product all these detailed information's are essentials to be communicated to every employee". (Innovation Manager of company A).

Participant A5: *"Spread of complete knowledge and information is an integral part of building human capabilities". (Market Development Manager of company A).*

6.1.5.3 Research and Development Capabilities:

It is significant to note that research and development is an important factor for the internal eco-capabilities of the firm. Research and development, according to all interviewees, are essential steps in the adoption of eco-packaging. The interviewee from case A describes that:

Participant A2: *"Research about what kind of eco-packaging is available in the market. What is their price? What kind of packaging competitor companies are using? What will be the impact of adopting eco-packaging on product cost? What are the short-run and long-run impacts of that packaging adoption?" (Research and Development Manager of company A).*

Participant A5: *"We are doing research and gathering information on different eco-friendly materials available in the market and different eco-packaging that is existed in the market to get a perfect substitute for our old packaging". (Market Development Manager of company A).*

The company A participants also accepted that they have invested in research for different eco-packaging materials to make sure that they adopt suitable eco-packaging for their food and drink products. it is very important to make sure that the eco-material that the company is using for the product is suitable for it and fulfils all requirements of traditional packaging. The interviewee from company A explains that:

Participant A6: *"While we were implementing eco initiative we research eco-design innovation in packaging gathering knowledge and information about different raw materials, their costs, and their features to find the best suitable eco-packaging material for our products". (General Manager of company A).*

The outcome of eco-packaging adoption:

As the companies selected for the research have already adopted eco-innovation in terms of packaging therefore their employees have prior knowledge and reliable information on the impact of eco-packaging adoption. Different participants also highlight barriers/challenges faced by their company at the early stages of the adoption process.

6.1.6 Green marketing:

Green marketing is one of the positive impacts of eco-packaging adoption on a company. Interview questions on green marketing constituting two areas eco-labelling, and environmental advertisement. Green marketing promotion-based strategies are discussed in this study with the interviewees. These green marketing strategies can directly contribute to improving the company's image.

Participant A6: *“If we are doing expenses and making efforts to bring change by playing our part in the economy, then it is essential to promote ourselves by telling people about our efforts”*. (General Manager of company A).

6.1.6.1 Eco-labelling:

Eco-labelling is one result of the company using eco-packing innovation in terms of green marketing. The following quote proves that:

Participant A5: *“After the introduction of environmental packaging we also include eco-labelling for our product packaging so that consumers can have an idea about our environmental policies and efforts for sustainability”*. (Market Development Manager of company A).

Another respondent also supported the argument that eco-packaging innovation can contribute to green marketing practices such as eco-labelling by the firm.

Participant A6: *“We are labelling our packaging for its recyclability, reusability, emissions, and proper disposal messages”*. (General Manager of company A).

6.1.6.2 Environmental Advertisement:

The interview findings are also showing that eco-innovation adoption is encouraging food and drink companies to use their efforts for taking advantage in form of environmental advertisements to satisfy their customers who are in favour of greener options. It is explained as:

Participant A6: *“Businesses depend on consumers and consumer knowledge is an important weapon for destruction or flourishing of business. We are working on our eco-packaging promotions by gradual changes in our advertisement so that we can increase customer awareness for our eco-packaging and other environmental efforts”*. (General Manager of company A).

6.1.7 Green Image:

Company recognition as an environmentally responsible organisation can boost its green image. This improvement or recognition of the green image is further contributing to gaining customer loyalty. The interviewee explains his company experience as:

Participant A1: *“Eco-packaging is also improving company’s reputation as well as help the firm to initiate programs to promote their initiatives for better revenues and good company image”.* (Research and Technology Manager of company A).

While the other hand it is also concluded that customers that have commitments toward the environment and a working understanding of the environmental effects of conventional packaging are showing loyalty to the companies that have their packaging-related environmental strategies and showing practical efforts toward the same.

Participant A4: *“After replacing traditional packaging with eco-packaging our company's many customers show a positive response to our efforts. Positively, eco-packaging is improving company’s image and bringing customers loyalty”.* (Marketing Director Manager of company A).

6.1.8 Waste Prevention

Waste reduction is another benefit that is directly linked with eco-packaging innovation. Participant from company A acknowledges that they are using less packaging material in order to consume fewer natural resources as basic materials and reduce packaging waste. The following quote is describing the company's efforts to reduce waste.

Respondent A1: *“We aim to remove all unnecessary packaging materials and moves toward more non-packaging products, especially where packaging is not necessary unless for transport purpose. Fruits, rice, and vegetables do not necessarily need too much packaging. Our future waste management strategy also aims to make products packaging free”.* (Research and Technology Manager of company A).

Reusing existing packaging in different ways is another option to reduce waste by the company. The interview findings show that company A is making efforts to educate consumers about reusing their product packaging and shopping bags. Paper packaging is also reusable as raw material after recycling.

Participant A4: *“Our paper packaging can be used as gift wrap and similarly other packaging materials are also recyclable and can be reused again as raw material”*. (Marketing Director of company A).

Participant A3: *“We encourage people to bring their reusable bags from home and for encouraging people to use reusable bags we are making a new strategy that will be launched soon”*. (Innovation Manager of company A).

Recyclable materials are also considered good substitutes for traditional plastic by companies. Respondents also claim that they are switching plastic with other recyclable packaging materials that have been tested to fulfil other functional requirements of product packaging.

Participant A2: *“Yes, by switching plastic packaging with recyclable plastic and other materials but it is not enough. So far, we have been working with few materials but now our future aim is to research more materials that can be a good alternative to plastic for our food items”*. (Research and Development Manager of company A).

Participant A4: *“Some of our food items contain recycled cardboard packaging”*. (Marketing Director of company A).

There are different ways that companies can use their waste management strategies to reduce waste. Eco-packaging adoption is also contributing to waste reduction through its reusability, recyclability, reduce and, and renewability features.

6.2 CASE B

Case B is a rapidly expanding consumer products firm with a wide variety of brands and years of expertise in the global food and drink industry. As the company has many brands therefore it has its packing unit for the packaging production of its products. This company is one of the very first companies in the UK that started doing experiments in form of changing its packaging materials by using recycled plastic and biodegradable packaging. Many of its food products are also using paper packaging now but they are finding it very difficult to change their liquid products' packaging into paper. They admit the fact that their drinks packaging still has some proportion of recycled plastic for safe transport of these products.

6.2.1 Understanding, Awareness, and Importance of Eco-packaging

As case A is an experienced international company with multiple brands around the world, so to maintain their company image and customer loyalty they are working on eco-packaging

materials for almost a decade. One of the company B managers explains that a huge investment is required if you are the very first company in the market to change its packaging and if you are a well-reputed brand, it is still a risky experiment because you have no idea about customers' reaction to it. Thus, he described the cost of eco-packaging as a barrier in its adoption process for many companies that are reluctant to do risky investments. One of the general managers in company B commented on the UK laws on it:

Participant B1: “Although producer responsibility for packaging law existed in the UK from 1997 it took a long time for its proper implementation because of lack of knowledge, the lack of finance for investment and understanding at the initial stages of its introduction. Till now this law is failed to abolish the use of plastic in the UK completely but it has brought a change in the use of packaging materials as now paper, recycled plastic and cardboard packaging are common packaging materials in different manufacturing sectors of the UK”. (Marketing Manager of company B).

Eco-packaging is also termed as green packaging and environmental packaging in the literature and somehow it is used as a synonym for sustainable packaging. According to one of the retail managers in company B:

Participant B3: “Eco-innovation in packaging, green packaging, sustainable packaging, and environmental packaging are synonyms as they are different names for the same thing or change. Eco-packaging should fulfil at least one criteria of sustainable packaging described by the international standard organisation”. (Retail Manager of company B).

6.2.2 Types of Eco-packaging for the food and drink sector

All the participants confirm that their companies are making efforts for environmental protection and sustainability. Therefore, they are replacing plastic packaging with eco-design packaging which is also termed green packaging, Eco-friendly packaging and eco-packaging. They explain how they are introducing different features in their packaging and what kind of different packaging materials they are using to replace traditional packaging.

Table 6.3: Types and features identified by Case B participants for eco-packaging.

Participant	Reuse	Renew	Reduce	Recycle	Recover
B1	✓			✓	
B2	✓	✓	✓	✓	

B3	✓			✓	
B4			✓	✓	
B5	✓	✓	✓	✓	
B6	✓		✓	✓	

Participant	Paper Packaging	Metal Packaging	Edible packaging	Consumer-waste Recycled Packaging	Cardboard Packaging	Biodegradable Packaging
B1	✓			✓	✓	
B2	✓				✓	
B3	✓				✓	
B4	✓			✓		
B5	✓	✓		✓	✓	
B6	✓	✓	✓	✓		

Company B employees show their commitment to using better eco-friendly packaging by accepting that they are using recyclable, reusable, paper, and cardboard packaging. Company B is collecting consumer waste and reusing it as recycled raw material for new packaging. The following quotes are proving it:

Participant B1: *“Most of our plastic is post-consumer recycled plastic (PCR) that is recycled from our packaging waste”*. (Marketing Manager of company B).

Participant B4: *“Currently we are recycling 10% of our post-consumer packaging waste every year but we are aiming to increase this recycling process up to 25% in 2025”*. (Research and Technology Manager of company B).

Participant B5: *“We are using post-consumer recycled (PCR) plastic for our packaging”*. (Environmental Manager of company B).

Even though the participants did not specifically use the word recoverable as a feature for their packaging, their packaging manufacturing process is explaining this term as they are using

consumer waste to recover some raw material to reuse it again. One of the respondents explains that his company is aiming to increase consumer waste collection to recycle and reuse it as a part of their waste management and sustainability strategy.

Participant B6: *“Our company is working on the target to cut back the use of traditional plastic by 100,000 tonnes in the next 5 years. We are collecting, recycling, and reusing 10% of our collected post-consumer used collected waste that will increase up to 25% in next 5 years”*.

The company is using paper, cardboard, and recycled plastic as packaging materials to replace traditional non-recyclable plastic. The interviewees from company B give their statement on it as:

Participant B4: *“We have introduced recyclable paper boxes for our food brands that will allow us to not use almost 4000 tons of plastic”*. (Research and Technology Manager of company B).

Participant B5: *“We have a successful implementation of recyclable paper-based packaging innovation for our food products”*. (Environmental Manager of company B).

Participant B6: *“For some of our products plastic packaging is replaced with paper and cardboard packaging”*. (General Manager of company B).

6.2.3 External drivers for Eco-packaging

The following figure is an evidence map to explain external drivers for the adoption of eco-packaging. Market expectations and stakeholders have emerged as new external driving factors.

Table 6.4: Evidence Mapping for the External Drivers for Eco-packaging adoption (Case Study B)

Key findings Evidence for Case B	Second-Order Themes	External Drivers	
Consumers are also aware of these waste management policies, plastic pollution, the effect of waste pollution on earth and human health, seawater pollution, plastic as a danger for sea mammals, deterioration of the natural environment, and the risk of losing natural climate for the future generation. This awareness is creating consumer demand for no plastic and eco-packaging.	Customers Demand		External Drivers
The most important driver in this competitive era is your business competitor, you must think before them and take your steps before them to survive in the market.			

Competitive pressure also existed in the market therefore to fulfil market expectations and to have a better image we are working hard on our eco-packaging adoption. Companies are establishing a competitive environment in the sector that urges other companies to do efforts from their side as well to decrease costs and improve their image in the sector.	Competitive Pressure	
Reduction in cost in form of extended producer responsibility fee that was initially named as packaging recovery note in the UK. Most of the internal drivers are related to sustainable strategy and reduction in legislation costs.	Environmental Regulations	
For a good market reputation in the market and to fulfil market expectations the change in packaging was an essential requirement. Market expectations and market demand for sustainability are also the main motivations for thinking about the no more plastic strategy.	Market Expectations	
If strategic changes are made by other business owners in the market, this is an obvious thing that your company stakeholders will ask you why you are not doing the same if it is beneficial for your company. To make decisions on strategic change, stakeholders must also be considered.	Stakeholders	
Source: Empirical data Analysis		

6.2.3.1 Competitive Pressure

The interviewee believes that competitive pressure work as a driving force for the companies to be more environmentally responsible and form policies and environmental strategies for their packaging. One of the Cases B employees explain it as:

Participant B1: *“The most important driver in this competitive era is your business competitor, you must think before them and take your steps before them to survive in the market”.* (Marketing Manager of company B).

This competitive pressure did not help a firm to survive in the market along with many other strong firms but also provide many other monetary and non-monetary benefits. One of the participants of company B linked competitive pressure and eco-packaging with an improved image and a decrease in company costs. In this aspect, the interviewee explains that:

Participant B6: *“Companies are establishing a competitive environment in the sector that urges other companies to do efforts from their side as well to decrease cost and improve their image in the sector”*. (General Manager of company B).

6.2.3.2 Customers Demand

The findings demonstrate that customers are aware of different environmental and health problems linked with traditional packaging materials and their non-proper disposal. These customers have the power to increase competitive pressure already created by rival companies within the sector by favouring the company that has already adopted eco-packaging. Thus, they have the power to create difficulties for the other non-adopters. This is supported by the following quote:

Participant B3: *“Consumers are also educated they are also responsible nowadays that they are also playing their part for removal of harmful substances as raw material in packaging. Their knowledge about the need for sustainable packaging is increasing day by day and because of that they are creating a competitive environment for companies that if they are not making efforts for a reduction in packaging waste then they have no right to stay in the market”*. (Retail Manager of company B).

Another participant from the same company B, also explains that the customers are very conscious and responsible nowadays. They understand the link between plastic packaging, waste, different types of pollution, and its impact on human health and future generation. All these negative impacts are also demanding improved eco-packaging. One of the statements regarding customer demand is:

Participant B6: *“Consumers are also aware of these waste management policies, plastic pollution, the effect of waste pollution on earth and human health, seawater pollution, plastic as the danger for sea mammals, deterioration of natural environment and risk of losing natural climate for the future generation. This awareness is creating consumer demand for no plastic and eco-packaging”*. (General Manager of company B).

Another interviewee also supported this fact by saying:

Participant B2: *“Demand from responsible customers who are showing concerns for the environment and have understanding for EPR and CSR”*. (Marketing Director of company B).

6.2.3.3 Environmental Regulations:

Most of the participants considered extended producer responsibility for packaging as an environmental regulation that is encouraging eco-packaging adoption. One argument is:

Participant B2: *“External drivers for eco-packaging adoption are extended producer responsibility (EPR) for packaging legislations”*. (Marketing Director of company B).

Another participant stated regarding extended producer responsibility (EPR) as:

Participant B6: *“The main driver for eco-packaging adoption is legislation in form of extended producer responsibility for packaging and the UK, it was known as packaging recovery notes (PRN)”*. (General Manager of company B).

It is significant to note that many firms in the food and drink sector are changing their packaging materials to decrease their extended producer responsibility (EPR) fee which is increasing the cost of production and can have a direct increase in the product price. One of the employees from case B agrees with this fact by saying that:

Participant B6: *“Producers are rethinking their packaging and decreasing the use of plastic as a packaging material that is difficult or almost impossible to recycle, they must pay less EPR fee. The aim to reduce this EPR fee cost moves the companies to the direction of eco-packaging base wase management programs”*. (General Manager of company B).

6.2.4 Managerial Environmental Awareness:

Managerial knowledge about the risk and benefits attached to the adoption of eco-packaging is of utmost importance. Existing studies reveal that a manager uses his risk awareness and cost awareness capabilities to take eco-innovation adoption decisions for the company.

6.2.4.1 Environmental Risk Awareness:

Various interviewees emphasise how important it is for managers to be aware of any risks connected to the implementation of eco-innovation. Different products have different packaging requirements (features) and a manager is a knowledgeable person who understands these requirements and links different packaging features with the product. Every product has different storage, transport, and packaging capacity and eco-packaging materials need to be up to the standard to be the raw material of food or drink packaging. One of the respondents explains it by using his own company experience as an example. He explained it as:

Participant B1: *“Managers always put efforts into increasing profit and improving brand value therefore their knowledge about implementing an eco-packaging-based strategy is a key to success for the company. Sometimes managers can highlight a specific important issue or aspect regarding the decision that we cannot think about. Like when we were discussing eco-packaging adoption one of our company store managers highlight the issue regarding transportation and hygiene issues of the food products if we switch to recycled paper packaging. Therefore, managerial knowledge and experience matter while taking company decisions”.* (Marketing Manager of company B).

Environmental managers are being sought after by businesses as exceptional individuals who are knowledgeable about the environment, the effects of packaging and manufacturing on the environment, and how businesses may project an image of being environmentally conscious. The environmental manager has his job responsibility to build a plan for the company that decreases the company’s emissions, and waste, and encourages less use of water and energy resources. Eco-packaging is considered an alternative to traditional packaging by the environmental manager after taking all aspects into the consideration. The environmental manager's responsibility regarding risk awareness is explained as:

Participant B4: *“Environmental managers are the specifically hired people to provide their knowledge and experience for better implementation of environmental strategies. Therefore, manager opinion is essential for the adoption of eco-packaging. Environmental managers collect market knowledge on available eco-packaging materials after that they collaborate with business partners for their knowledge on current packaging. His next step is to sketch the plan for the adoption of eco-packaging based on the specific features needed for the product. He estimates how much innovation in packaging will be easily adaptable for a specific brand and how much change will be required in form of technology and resources for new eco-packaging. After considering all alternative packaging options, requirements for packaging to be environment friendly, and getting data for emissions and energy and water usage of that specific eco-packaging he decides to adopt it or not. After all hard work, his decision is always accepted by the company for eco-packaging adoption”.* (Research and Technology Manager of company B).

6.2.4.2 Environmental Benefit Awareness:

The benefits of environmental packaging adoption are accepted by all respondents from case B. Managers may consider eco-packaging as an increase in their cost of production as eco-materials are not as cheap as plastic is. But these eco-packaging materials have many long-term

benefits and have less environmental damage as compared to plastic. So, evaluation of costs and benefits is an essential measure for the manager while deciding to invest in eco-packaging. this fact is explained by the interviewee as:

Participant B1: *“As per my knowledge finance and profit cannot be estimated before the experiment. You must take risks in your business if you want to flourish. If I will decide not to adopt eco-packaging since it may cost the company more than plastic packaging maybe I am losing my future profit”*. (Marketing Manager of company B).

However, managerial knowledge is also not enough for eco-packaging adoption decisions. Because eco-innovation is a very new area of discussion, it still needs more data, information, and knowledge to estimate its costs and benefits. There is not enough long-term data available specifically for eco-packaging adoption as this phenomenon is still new for many countries around the world where plastic is still used as a favourable packaging material. The lack of empirical data on eco-packaging makes it difficult for a manager to evaluate costs and future profits therefore, we cannot directly link managerial benefit awareness with the decision to adopt eco-packaging. the following argument from one of the respondents of case B is clarifying this statement:

Participant B5: *“Cost and benefits can only be estimated after experience in long run. Any manager can have a correct estimate for the short run, but he will not be able to give exact data on long-run revenues. In the case of eco-innovation in packaging, it is also very difficult to estimate profit or cost accurately because it is a very new field, there are new green packaging inventions on regular basis. Companies are experimenting with different recyclable materials, and they did not have any long-run data available yet”*. (Environmental Manager of company B).

6.2.5 Eco-capabilities

6.2.5.1 Technological Capabilities

Many respondents define technological capability as the capacity to modify or introduce new technology into a manufacturing process in order to increase sustainability and the effective use of environmental resources. All interview participants explain that technological innovation is also essential for a company before the adoption of eco-innovation. They agree that they do adopt new innovative technology and bring changes to their traditional. The importance of technology change is clear from the following quote:

Participant B6: *“There are different technologies for different packaging materials, their handling, processing, storage, transportation, shape, and size requirements are different from each other. This difference is because of their features like weight, water and fire resistance, and temperature handling. Therefore, when we started using paper and paperboard eco-packaging, we brought new technology that was different from plastic packaging manufacturing technology”.* (General Manager of company B).

6.2.5.2 Human Capabilities

Different participants define human capabilities according to their understanding and they include different contributing factors to human capabilities. These contributing factors are divided into three categories during the analysis of interviews.

a. Health and safety:

The interviewees from the company believe that health and safety training is an essential part of employee capability, and they also provide reasonably required training to their employees before the adoption of eco-packaging. As claimed by one of the interviewees:

Participant B3: *“Our company has introduced many schemes for employees regarding their protection at work and improving their salary after getting a certain level of knowledge and experience within the company”.* (Retail Manager of company B).

The use of eco-packaging also requires additional types of training for the employee, according to a different respondent. On the question of training as a human capability, it was explained that:

Participant B6: *“they were also trained for using new machinery and handling new materials”.* (General Manager of company B).

b. Employee training

Almost all respondents agree that for eco-packaging adoption all training needs should be fulfilled for processing eco-packaging-related production operations effectively and timely. This training will also improve work efficiency. The respondent representative of Company explains that:

Respondent B2: *“Human has a built-in function of knowledge improvement. If a company is bringing any change, the employees will also be an integral part of that change therefore, there is a basic requirement to equip them with the necessary training and knowledge. This training*

and knowledge improvement is called human capability that he uses for work efficiency and achievement of best result”. (Marketing Director of company B).

From the findings from company B, it is concluded that they have organized proper training before the adoption of eco-packaging. They spread complete knowledge and information among their employees within each relevant department of the company as they claimed that the communication gap also creates problems for the smooth adoption process. It needs a complete understanding of the decision to bring new packaging between employee and employer. The interviewee explains that:

Respondent B3: *“Our company organises training workshops every 6 months to keep our employees satisfied with the company and their job. We equipped them with all necessary training and knowledge about every small change in the company specifically if it is related to their job in the company. This investment in employees increases their confidence in a company and makes them more loyal towards their job”. (Retail Manager of company B).*

Another respondent also explains that they provide all kinds of information and training to their employees:

Respondent B5: *“we organized training sessions for employees and gave them written notes and lectures on every aspect of new material including their first invention as green material to their temperature, recycling, usage, feature, availability, cost, characteristics, environmental impact, benefit, health, and safety measures and how these materials are different but better than plastic”. (Environmental Manager of company B).*

Respondent B6: *“training was the basic requirement for the effective eco-packaging adoption and so every employee was given specific training based on his role in the packaging manufacturing and product packaging process”. (General Manager of company B).*

c. Employee Knowledge

Knowledge is also a part of training. It is mainly linked with the provision of all necessary knowledge about any new policy, decision, strategy, or innovation to the employees. One of the respondents explains it as:

Respondent B1: *“It also includes handling information and other resources essential before the adoption of that specific eco-packaging. We have arranged many workshops in the past, and we are doing these workshops currently as well to keep our people completely equipped with essential information”. (Marketing Manager of company B).*

Another respondent explains his company’s efforts to spread knowledge as:

Respondent B4: *“Our company organised educational knowledge-based meetings where every employee was given complete information about new materials”*. (Research and Technology Manager of company B).

Employee knowledge is mainly considered as a part of training by many interviewees therefore it is explained that employee knowledge:

Respondent B4: *“can be increased by training and workshops for them to increase their knowledge and to make them understand how practically they can increase their work efficiency in new technology. This is one of the initial steps of eco-packaging implementation and without this effortless eco-packaging adoption is impossible”*. (Research and Technology Manager of company B).

6.2.5.3 Research and Development Capabilities

When respondents were asked about research and development as a company's capability to adopt eco-packaging, almost all respondents agree to the fact that research on different available eco-materials and eco-design is necessary to adopt eco-packaging specifically for the food and drink companies. All respondents explain their understanding of different resources that they can rely on for researching eco-packaging. Research and development for eco-packaging are explained as:

Respondent B2: *“Research and development for eco-innovation include knowledge of new eco-technology, new eco-packaging, requirements of recycling operations, authenticated data for the newly available eco-materials, framework, and step-by-step plan of execution for the adoption of eco-packing”*. (Marketing Director of company B).

Respondent B4: *“Research and development for eco-packaging mean having up-to-date knowledge in new eco-packaging around the world, the new experimental eco-packaging based on their characteristics and costs. There may be a specific less costly eco-packaging available around the world but not in your country and if you have enough research on it then you can import it at less cost”*. (Research and Technology Manager of company B).

Respondent B5: *“Research and development for eco-packaging mean obtaining knowledge for all available green materials, understanding the difference between sustainable packaging, green and eco-packaging, basic requirements, and different steps involve in eco-packaging adoption and how much practice training is needed and from where and how this knowledge and training will be given to employees”*. (Environmental Manager of company B).

Many respondents agree with the fact that different already existing authenticated research help companies to understand the prerequisites, pros, and cons of eco-packaging adoption. The same fact is explained by the interviewee as:

Respondent B6: Research and development include the latest knowledge in the eco-packaging field. It includes all new academic studies and research by research institutions and laboratories on different available eco-packaging options. This knowledge increases confidence and creates positive feelings for eco-packaging adoption. We can say that this is the initial preparation that is necessary for requires results after the execution of the plan. The research will improve knowledge about needs that are prerequisites of eco-packaging adoption and it tells a company how they can develop their internal sources before adoption. (General Manager of company B).

6.2.6 Green Marketing

Green marketing is captured as a communication strategy in this research in form of environmental advertisement, eco-labelling, and green images. These means of communication are used by the selected study companies to publicise their green strategies for positive results. it is explained with:

Participant B5: “Our company is using green marketing techniques for informing consumers about environmental efforts and changes made by the company”. (Environmental Manager of company B).

Participant B4: “We are using environmental colour schemes, labelling, and graphics on our packaging to spread environmental commitments of our company through packaging improvement. It also contains the carbon footprint, proper disposal, and reusability knowledge for every household that this way they can play their part to save the planet and natural environment”. (Research and Technology Manager of company B).

6.2.6.1 Environmental Advertisement

The interviewees agree that their company is self-advertising its green credentials to gain advantages by creating consumer awareness.

Participant B1: “We are spreading awareness throw our advertisement for a small number of, recycled or no plastic products and finishing throwaway traditions from every economy where we are selling our brands”. (Marketing Manager of company B).

Participant B3: *“We have an environmental advertisement strategy that shows our environmental commitments and efforts”*. (Retail Manager of company B).

6.2.6.2 Eco-labelling

It is agreed by the research participants that different types of labels are used as a promotional marketing strategy by case company A. They talked about emissions, recycling information, different reusability features of the packaging, and information about eco-materials used in the packaging as raw material.

Participant B3: *“Our product packaging has all recycling information along with its reusability features”*. (Retail Manager of company B).

Participant B4: *“We have eco-labelling, emissions addressability features on our packaging”*. (Research and Technology Manager of company B).

Participant B5: *“Every packaging has detailed knowledge about the emissions in the air during the production and process of that specific packaging”*. (Environmental Manager of company B).

Participant B6: *“We have our product packaging labelled with CO₂ and other emission details during the production process”*. (General Manager of company B).

6.2.7 Green Image

Eco-packaging is directly linked to the improved company image as proved by the information given by the respondents. One participant cited that improvement in the image help company to survive in the competitive market.

Participant B1: *“Our company image has been improved in the market and its survival has become easy after eco-packaging adoption”*. (Marketing Manager of company B).

One of the research participants linked EPR with eco-packaging innovation and a green image. According to him switching to eco-friendly materials is decreasing the extended producer responsibility (EPR) cost of the firm.

Participant B6: *“EPR fee is a cost for the company, the switching packaging material from plastic to green materials will benefit the company in terms of decreasing cost and improving company reputation”*. (General Manager of company B).

An increase in future profitability is also one aspect of improving the company's image by adopting eco-packaging.

Participant B5: *“We are hoping that in the future we will convert all these costs into profit by improving company image, creating a green reputation in the market”*. (Environmental Manager of company B).

6.2.8 Waste Reduction

The interviewees in Case B confirm that eco-packaging is also linked with waste reduction. To cut down environmental impacts the companies are reducing the raw materials and increasing the recycling of packaging waste that resultantly contributes to the waste reduction. Less raw material means less packaging waste and the same is quoted as:

Participant B3: *“We have also decreased the quantity of our product packaging by incorporating fewer layers in packaging and changing the packaging size”*. (Retail Manager of company B).

Participant B5: *“To decrease waste, we have decreased the amount of packaging material by making our packaging more accurate in size and reduction of plastic layers in packaging”*. (Environmental Manager of company B).

Company B is also using reusable packaging material as its environmental strategy and waste reduction. The proof of this argument is quoted below:

Participant B5: *“Reusability feature helps to decrease the amount of waste as consumers and other companies are encouraged to reuse bottles. Our packaging is refillable and reusable, and we are creating awareness in consumers that they can refill them again with the same product or any other thing they want to”*. (Environmental Manager of company B).

Another participant explains the reusability feature of its company packaging as:

Participant B6: *“For drinks, our strategic initiative is implemented by making the packaging materials refillable and reusable. These materials have cleaning properties that they can be cleaned easily and then can be reused for different purposes and by different sectors”*. (General Manager of company B).

To lessen the impact of packaging on the environment and to decrease waste, various recyclable materials are also employed as eco-packing materials.

Participant B3: *“For some of our liquids we are using recycled plastic as per the requirement of storage and traveling of those products. Recycled plastic polyethylene (PE) is another common type of environment-friendly innovation in packaging that is replacing plastic as a raw material for packaging”*. (Retail Manager of company B).

Participant B4: *“Our company is responsibly moving towards recycled materials. We started using paperboard and recycled plastic as eco-packaging for our food and drinks many 5 years ago. Before that most of our products were wrapped in plastic”*. (Research and Technology Manager of company B).

Food and drink companies are replacing plastic with other materials and recycled plastic after careful consideration that they can use these eco-friendly materials for food and drink packing.

Participant B6: *“Now this sector is getting progress and using plastic polyethylene (PE) instead of traditional plastic and paper and paperboard packaging materials for food products”*. (General Manager of company B).

6.3 CASE C

Case C is a food and drink company with a big proportion of drink products and a small number of food items. It is UK's one of the oldest companies that are also a competitor of Case B. But as the company has more of its proportion in drinks production as compared to food so this company has intensive detailed knowledge of many eco-materials that can be an alternative to plastic. This company is one of the first in the UK who introduced paper straws for their juices. They have their packaging production plant where most of their product packaging is manufactured but they buy their materials from different companies around the world who have their expertise and experience in these new materials. Still, their 100% packaging is not eco-friendly, but they have a recycling unit to recycle their packaging waste to reuse it as raw material.

6.3.1 Understanding, Awareness, and Importance of Eco-packaging

Many interviewees from Company C, shows a huge experience and knowledge of eco-packaging. The company has its research facilities to innovate its packaging. The research and development manager in the company linked eco-packaging with the zero-waste strategy. According to him:

Participant C4: “The packaging that is easily degradable with no ends up in landfill is an eco-packaging. This innovation in packaging was introduced a decade ago and established on the extended producer responsibility for packaging regulations. These regulations create producer responsibility for their packaging waste so that the sea, environment, human health, and the world can stay protected. Different environmental and health problems and the difficult disposal of plastic was the root cause of the introduction of these regulations. Wate

management, zero waste economy, and circular economy approaches are also base for the introduction of eco-friendly packaging” (Marketing Manager of company C).

Eco-packaging is also linked with extended producer responsibility (EPR) for packaging. According to the innovation manager in Company C:

Participant C6: “Eco-packaging innovation introduced as a solution for producers for their extended producer responsibility for packaging so that they can reduce their EPR for packaging cost by the introduction of sustainable packaging” (Product Manager of company C).

Companies are improving their knowledge in eco-packaging and using it as a part of their marketing strategy for a better company image. If you have the required knowledge, and experience and understand the importance of environmental initiatives you can link them with the company’s marketing policies for better customer response. The environmental manager in company C explains it in the following words:

Participant C3: The businesses are shifting their focus from only marketing to concerning nature and customers. Eco-packaging is one of those strategies that are adopted by different companies to fulfil their social responsibility coinciding with care for customers and nature. Many sectors are showing their efforts via their policies to manage their packaging waste by using better packaging materials (Packaging waste management Researcher of company C).

6.3.2 Types of Eco-packaging for the food and drink sector

Interview participants were questioned about the desired eco-packaging features/type that they think are crucial for the food and drink businesses. The number of participants from company case A shows the same level of understanding while answering this question as their defined features for eco-packaging were quite like each other. Many of the eco-packaging types are different from each other based on their raw material and manufacturing process. Eco-packaging features explained by the participants are also related to waste management i.e., recyclable, reusable, renewable, recoverable, etc. The following table is explaining the type of packing features that are essential for the packaging to be considered eco-packaging and based on these features can be embraced by food companies.

Table 6.5: Types and features identified by Case C participants for eco-packaging

Participant	Reuse	Renew	Reduce	Recycle	Recover

C1			✓	✓	✓
C2			✓		
C3					
C4	✓		✓		
C5					

Participant	Paper Packaging	Metal Packaging	Edible packaging	Consumer-waste Recycled Packaging	Cardboard Packaging	Biodegradable Packaging
C1	✓				✓	
C2	✓				✓	
C3	✓					
C4	✓					
C5		✓				

As compared to cases A and B, case C participants show fewer eco-innovation practices in terms of packaging. This is because of that they started using eco-packaging a few years ago as they are not early adopters of new practices. They stressed the fact that:

Participant C1: *“We have certification of sustainable resourcing for our packaging materials and have also introduced paper wrappers as eco-packaging for one of our company products in 2020. We are continuously increasing the recycled materials in our packaging every year. We are trying to use recycled paper for most of our food products and launch a new paper-based packaging in 2020 as well” (Packaging Developer of company C).*

The respondents also explain their commitment to the environment by using responsible, certified resources for their packaging of raw materials.

Participant C4: “*Most of our packaging raw material is imported by environmentally responsible resources that have proper certification of responsible production of bamboo trees and using them for making paper and cardboards for packaging*” (Marketing Manager of company C).

Like other companies, they are also planning to completely replace plastic content from their packaging with other eco-friendly materials.

Participant C2: “*Based on circular economy ambition we are decreasing the use of virgin plastic and replacing a big part of the packaging with recycled plastic packaging*” (Innovation Manager of company C).

Participant C4: “*Initially our food product packaging was using thin plastic layer outside the packaging but to decrease the use of plastic and for less waste, our company is no more using an extra thin layer of plastic around the product packaging*” (Marketing Manager of company C).

6.3.3 External Drivers for Eco-packaging

The following figure is an evidence map to explain external drivers for the adoption of eco-packaging. The newly explored factors in case C are highlighted in the last row of the following table 6.6.

Table 6.6: Evidence Mapping for the External Drivers for Eco-packaging adoption (Case Study C)

Key findings Evidence for Case C	Second-Order Themes	External Drivers
<p>Consumers are also well educated and care for their health and environment therefore, they are also playing an active role in the improvement of packaging materials.</p> <p>Customers' green or environmental packaging demand is also increasing day by day which also urges firms to adopt better eco-packaging for their products.</p>	Customers Demand	
<p>As a strategic step competitor are also showing efforts for the zero waste and sustainability initiative that create external pressure for other rivals to rethink their packaging.</p>		

Competitive pressure is also a driving force behind eco-packaging adoption in form of competitive advantage, creation of a green image, and increase in market shares.	Competitive Pressure	
Currently, we have decreased our EPR fee cost by replacing a specific percentage of virgin plastic packaging with recycled plastic and some with paper packaging.	Environmental Regulations	
Stakeholders and customers also create demand-pull pressure for the producers to deal with plastic waste and think about their environmental responsibility.	Stakeholders	
Source: Derived from empirical data		

6.3.3.1 Competitive Pressure

Competition has increased nowadays due to new technological innovations and globalisation. For a company to maintain its market image and position has to think and act upon the opportunities available and innovations adopted by the other firms in the market.

Respondent C4: *“As a strategic step competitor are also showing efforts for the zero waste and sustainability initiative that create an external pressure for other rivals to rethink their packaging” (Marketing Manager of company C).*

Many participants cite competitive pressure as a big driving force behind eco-packaging adoption.

Respondent C5: *“Competitive pressure is also a driving force behind eco-packaging adoption in form of competitive advantage, creation of the green image, and increase in market shares” (Environmental Manager of company C).*

6.3.3.2 Customers Demand

Numerous research on innovation, environmental preservation, and eco-innovation demonstrates that there is a rising consumer demand for eco-innovation. Businesses are using eco-labels and marketing strategies to heighten their business contribution to the environment. The health problems created by the production processes are also creating awareness among consumers. The quote below is describing how much customer demand exists in the market for eco-packaging:

Respondent C3: *“Customers are always considered as right as they are the main source of income for production companies and to retain their customer and market image producers always change their strategies following consumer’s demand. Environmental issues also create health problems and awareness of these health and environmental problems increases customers’ knowledge of plastic waste, emissions, and the solution to these problems. That leads to the pressure by consumers for environmental packaging materials”* (Packaging waste management Researcher of company C).

It is agreed by the other respondent:

Respondent C5: *“Customers’ green or environmental packaging demand is also increasing day-by-day also urges firms to adopt better eco-packaging for their products”* (Environmental Manager of company C).

6.3.3.3 Environmental Regulations

Environmental regulations in terms of extended producer responsibility for packaging are highlighted by many participants as driving factors for eco-design innovation in packaging. Even though environmental regulations are differently implemented in different countries around the world, their aim is the same for all, that is to put waste management responsibility on the producer so that there will be less environmental damage during the life cycle of product packaging.

Respondent C1: *“This innovation in packaging was introduced a decade ago and established on the extended producer responsibility for packaging regulations. These regulations create producer responsibility for their packaging waste so that sea, environment, human health, and the world can stay protected”* (Packaging Developer of company C).

He also agreed that to decrease their extended producer responsibility fee, which was increasing their cost of production, they replace their traditional packaging with paper and recycled plastic material due to their environmental features:

Respondent C1: *“Currently we have decreased our EPR fee cost by replacing a specific percentage of virgin plastic packaging with recycled plastic and some with paper packaging”* (Packaging Developer of company C).

It is also agreed by another respondent:

Respondent C4: *“Eco-innovation introduced as a solution for producers for their extended producer responsibility so that they can reduce their EPR cost by the introduction of sustainable practices into their business activities” (Marketing Manager of company C).*

6.3.4 Managerial Environmental Awareness

6.3.4.1 Environmental Risk Awareness

The companies are hiring environmental managers with adequate knowledge in their field to take environmental strategic decisions for the company. These managers have complete knowledge about the environmental damages that a company causes while its production process. According to many responses, environmental managers are well aware of the dangers that various packaging materials provide to the environment and the long-term viability of the business. The same fact is explained as:

Participant C1: *“Environmental managers are hired in the company nowadays for keeping an eye and improvement in the environmental performance of the company so whatever they think they have proper reasoning and justification for it and their decisions as always best for company image in the market. Therefore, managers always have their importance in the decision-making process of eco-innovation adoption by the company” (Packaging Developer of company C).*

The importance of managerial knowledge regarding the risk associated with the traditional and new eco-packaging material is explained by another respondent as:

Participant C4: *“Managers know that when the companies were using plastic as packaging, they were not considering its environmental damages. But now they have enough knowledge about why environmental and public organisations are promoting eco-friendly or sustainable packaging. The benefits of eco-packaging adoption include less CO₂ emissions, energy savings, less water waste, recycled material saving money, easy waste management, and fewer costs to pay in form of packaging legislation fees. Managers are now aware of all environmental and business benefits of eco-packaging and their knowledge is enough to agree on directors, stakeholders, and CEOs decide on such eco-innovation adoption” (Marketing Manager of company C).*

Different managers in the company have their importance in the decision regarding eco-packaging adoption. It is not only one person's decision, but many other department managers have a contribution to understanding eco-packaging and its importance for the firm. It has also been justified by the respondent with the following statement:

Participant C5: *“For eco-packaging, to decide its adoption environmental manager, marketing manager, packaging design manager, and product development managers work together to ensure that eco-packaging has all needed functional, environmental, and marketing features. So, if they have a collective decision then they can convince anyone including company directors and stakeholders to implement this environment packaging decision based on their justification for the eco-packaging adoption” (Environmental Manager of company C).*

6.3.4.2 Environmental Benefit Awareness

From the findings, the environmental benefit awareness is validated as an essential factor for the eco-packaging adoption decision by the manager. Managers can convince higher authorities within the firm to invest in eco-packaging even though it is considered an increase in cost for the firm. The respondent explains that managers can have an influence on eco-packaging adoption by the firm if they have extensive knowledge of the environmental benefits of eco-packaging. One interviewee from case C believes that:

Participant C4: *“Anyone can raise questions on the eco-packaging adoption as it includes high costs for investment. But a manager's knowledge about finance as costs and future benefits as revenues is enough to agree on everyone in the decision-making process to adopt eco-packaging. Our company managers solve the problem related to the availability of finance for packaging eco-innovation by showing the figures of energy savings and future revenues, by, the time available for investment, and to get revenue from investment. Managers' perfect plan for current investment, costs, savings, subsidies, and future revenues from eco-packaging adoption can encourage its adoption within the industry” (Marketing Manager of company C).*

But one respondent from Company C has a different opinion on this matter. According to him, managers are not the right person to have financial benefit knowledge so their decision is not always based on financial profits. The awareness

Participant C2: *“No, as every manager is not hired by the company to keep finance data with him, therefore, manager many do not have correct estimations of costs and revenues, especially when he is working in an international company that is operating around the world in different*

countries. In such companies, only one manager did not have strong opinions and knowledge of finance for investment in a specific strategy” (Innovation Manager of company C).

6.3.5 Eco-capabilities

6.3.5.1 Technological Capabilities

Technological capabilities are linked to different types of eco-innovations in form of different efficiencies created by new innovative technologies. Some respondents agree that new innovative technology is directly linked to the adoption of eco-packaging. These technologies are termed green technologies by the interviewees. The technological change for eco-innovation is considered under the eco-capabilities of the firm that are driving factors for the adoption of eco-packaging. One participant stressed the introduction of new technology linked to the new eco-packaging material used by their firm.

Participant C1: *“This new technology will be the requirement for working with new eco-packaging materials along with fewer emissions in the air, less energy and water waste. This new technology can also have the ability to use renewable energy resources that can decrease company cost” (Packaging Developer of company C).*

In agreement with this statement, other participant states that:

Participant C2: *“Technical changes are also necessary for the adoption of any new strategy or bring change in production operation. These changes are mostly related to the new technology for recycling operations and for using different materials. When we started working with paper packaging our company invest in new technology required for paper packaging” (Innovation manager of company C).*

The technological capabilities of a firm are also linked to efficient use of resources which is considered a part of the sustainable strategy of the firm. This fact is supported by another statement given by a respondent:

Participant C3: *“Introduction of eco-technology, eco-process, and eco-packaging is also linked with less use of energy, water, and other natural resources along with reusing recycled water and renewable energy for the production process. This new eco-technology also creates its internal demand by providing business benefits” (Packaging Waste Management Researcher of company C).*

It is important to note here that each participant from company C considered technological capabilities essential for the adoption of eco-packaging and they agree that their firm introduced new technological changes before the implementation of their new eco-packaging.

6.3.5.2 Human Capabilities

Human capabilities are defined in different ways by almost all research participants. But most of them considered three main categories of human capabilities that are defined in the already existing research.

a. Health and safety

The interviewees believe that health and safety is an important dimension of human capabilities as it is directly linked to their physical and mental health. But not all participants talked about it by directly linking it with eco-packaging adoption. One participant explains as while working on different materials or after bringing any change in the firm operations, employees must be given training about the handling of these new materials, and considered precautionary measures while working on new machinery, equipment, or new material.

Participant C3: *“Human capability also includes employee training for their health and safety while working with different new materials and technology” (Packaging Waste Management Researcher of company C).*

b. Employee training

Although staff training is also a component of health and safety measures, many participants place more importance on it as a crucial component of the company's eco-innovation strategy. The company's effort in terms of employee training to keep them equipped with essential knowledge regarding technological and other changes in the firm strengthens the relationship between employees and employers by bringing loyalty to the firm. As per interviewees' knowledge, every change whether it is technological or strategic requires firms to take their employees into confidence by spreading complete knowledge of that change and arrangement of different learning sessions for them to adopt that change.

Participant C3: *“Companies can arrange seminars and practical training classes for their employees after bringing new technology for the adoption of eco-packaging. At first, the company may be considered as a cost, but employees are intangible assets of the company and*

can bring long-term benefits in the future” (Packaging Waste Management Researcher of company C).

This is supported by the information given by one participant regarding his own experience within his company:

Participant C5: *“As we are using recycling material in packaging, so this new technology is helping us to work smoothly and to improve our environmental performance. Before starting our working with this new technology, all necessary training was given to the employees” (Environmental Manager of company C).*

It is believed that employee training, and health and safety measures are directly linked with human capabilities that are linked with the change in company strategy.

C. Employee Knowledge

As far as the interviewees' point of view, knowledge is simply explained as information or providing the valuable answer to the employee's questions while the introduction of a new strategy or bringing any change into form operations. From the findings, it could be considered that employees can have many questions in their mind about the adoption of eco-materials for company products. Their questions should be answered by the employer that why eco-packaging materials need time and how they can bring long-term benefits to the company. However, some participants highlighted the fact that many employees encourage their company to adopt eco-packaging as they already have up-to-date knowledge about market trends and new packaging introduced by the other companies in the market.

Participant C4: *“Employees can also encourage firm internally to adopt eco-packaging when they learn about its requirement and benefits” (Product Developer Researcher of company C).*

6.3.5.3 Research and Development Capabilities

Every participant in study C agreed that having the opportunity to do research and development was crucial to the adoption of eco-packaging. Therefore, the adoption of eco-packaging innovation is enhanced by research and development capacity. An interviewee from case study C explained that:

Participant C1: *“Research and development for eco-packaging adoption help companies to understand the market dynamics that help them in better decision making. Research and development also help companies to keep tempo with their environmental sustainability and*

waste management goals. This research and development also improve efficiency at work” (Product Developer of company C).

Another participant explains the research and development capability for eco-packaging as:

Participant C2: “Research and development resources are also internal capabilities for a company. These resources are necessary to attain require scientific knowledge from academic institutes before using any new material for packaging. For example, as a food and drink company, we develop our research and development network to check hygiene level, water, and fire resistance, shelf life, and storage information of recycled plastic built eco-packaging” (Innovation Manager of company C).

The respondents also explain how their company introduced research and development activities in their firm to introduce innovation and fulfilling their sustainability initiatives.

Participant C3: “Our company has its research and development centres to fulfil the environmental sustainability responsibility of the company. This research and development centre has two main responsibilities. One created of new environmental product, process, packaging, and technology, and the second gave suggestions for the existed product, process, packaging, and technology and how we can improve it under our environmental sustainability initiative. Our sustainability program directly estimates and assesses the environmental performance of the company throughout its entire value chain and at the first stage of newly introduced innovative environmental designs” (Packaging Waste Management Researcher of company C).

The same fact that research and development is an essential requirement for eco-packaging adoption is explained by other respondents as:

Participant C4: “Research on eco-packaging is helping our company to answer many questions related to its adoption to be ready before changing product packaging. Our company is also investing in research and development for environmental packaging so that we can have the best packaging solution for our food and drinks. Research is also helping our company to compare costs of different available eco-friendly materials around the world” (Marketing Manager of company C).

Respondent C5: “Our company has established an institute of packaging science in 2019 for research and development on sustainable packaging for healthier, safe, and operational packaging to address worldwide packaging waste challenges” (Environmental Manager of company C).

6.3.6 Green Marketing

While discussing green marketing's relationship with eco-friendly packaging, many interviewees explain that green marketing is directly implemented through eco-innovation in packaging. The business is using less raw material for packaging in order to manage resources more effectively and avoid waste, but it also uses this move as a marketing strategy to appeal to consumers who care about the environment and grow its base of devoted customers. It was said:

Participant C3: *“Our company is marketing all environmental commitments, strategies, and changes to the consumers every day to build trust and, to make them feel happy for our efforts or environment. Our brand communication incorporates our environmental responsibility for packaging efforts where it is appropriate to convey. Our packaging also has recyclability and responsibly sourced raw material, and correct disposal information to educate buyers for their part of responsibility”* (Packaging Waste Management Researcher of company C).

Another participant explains it as:

Participant C5: *“We are communicating recyclability and reusability feature to our consumers via marketing communication for proper disposal of packaging waste”* (Environmental Manager of company C).

6.3.6.1 Environmental Advertisement

The use of environmentally friendly packaging innovations, according to all interviewees, helps the company's green marketing strategy promote itself in the environment. Company C is using its investment in environmental packaging as a promotional strategy for the environmental contribution of the company. This is explained by participant C4 as:

Participant C4: *“To build consumer’s trust our company is communicating our environmental initiatives to everyone on regular basis. Our company is also integrating our eco-innovation and waste management efforts in our product packaging for proper communication”* (Marketing Manager of company C).

The company is using advertisements and social media to communicate with customers for conveying their efforts for environmental sustainability. Another interviewee explains that:

Participant C5: *“Our company is using both television advertisements and social media to advertise our green policies and strategical changes in the packaging to our customers”* (Environmental Manager of company C).

6.3.6.2 Eco-labelling

Many interviewees consider eco-labelling as recycling, reusability, emission, and information regarding used and reused resources as eco-labelling. They are using different marketing tools in form of recycling images and other logos to explain their packaging. One of the participants said:

Participant C4: *“We are also creating awareness in consumers by clearly describing the best way for disposal of our packaging waste. The instructions on the packaging also educate buyers about its reusability and renewability as well. Our packaging also contains the knowledge of our responsible resourcing and emissions details. We are also assimilating proper waste proposal details on our packaging so that there will be responsible disposal and less pollution and waste”* (Marketing Manager of company C).

The company employees revealed that the new eco-friendly packaging can contribute to environmental protection in different ways including fewer emissions, and less usage of water, energy, and other natural resources. Eco-labelling is simply explaining these features of our new packaging to the customers. One participant mentions it as:

Participant C5: *“Our packaging has eco-labelling, emissions, and recycling information clearly written on it so that consumers can understand our efforts. Proper disposal information of packaging waste is also mentioned on the packaging for throwing it in the relevant bins”* (Environmental Manager of company C).

6.3.7 Green Image:

The research participants agree that green marketing is used by companies to create a green image of the company by targeting the buyers. Eco-label is used as a green marketing strategy in this aspect to increase the awareness among customers, shareholders of the company’s and environmental strategy. One of the responders cited the following information as this fact:

Respondent C5: *“If a company is switching its packaging strategy from plastic to environment-friendly materials, they can decrease this cost and improve their image in the eye of their stakeholders and customers”* (Environmental Manager of company C).

6.3.8 Waste Reduction

The interview data analysis also creates a connection between eco-friendly packaging and waste minimisation. But there are mixed views on it by the employees as many employees compared the cost of separating recyclable and non-recyclable waste with the waste reduction

fee and they find that the cost of waste separation is more than the reduction in their fee. Another interviewee explains that the company can recover this cost by reusing its recyclable material as raw material so there will be less cost for buying new materials for packaging. One participant said:

Participant C1: *“We have Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC) for our paper resourcing as packaging material. We are collecting and recovering the same amount and volume of plastic every year that we are using for our packaging in the same year to fulfil our environmental and producer responsibility” (Packaging Developer of company C).*

According to the marketing manager of the company C, less use of raw materials for environmental protection is also linked with less waste. The recyclability feature of eco-friendly packaging is also contributing to waste minimisation.

Participant C4: *“Initially our food product packaging was using thin plastic layer outside the packaging but to decrease the use of plastic and for less waste, our company is no more using extra than a layer of plastic around the product packaging” (Marketing Manager of company C).*

6.4 CASE D

Company D is not an old company as compared to A, B, and C but it has started its business in the UK almost 30 years ago. Another difference between this company from all other cases is that this company did not have its packaging manufacturing unit in the UK. Therefore, it depends on some native and some other international packaging manufacturing companies for their product packaging. The participants in this company's survey provided some extremely fascinating insights, yet they nevertheless demonstrated sufficient awareness of various packaging materials as well as the value of ecologically friendly packaging for businesses.

This company was the last company among all other participant companies in the adoption of eco-packaging, so they have both benefits and loss both in this phenomenon. Loss as they are not the early adopter and non-manufacturer of eco-packaging, so they have no specialisation in this field until they adopt it. Benefit in terms of the fact that when they adopt it they were having enough knowledge and data about companies that were already using it. The early adopters also face consumers' questions regarding the change and their criticism as well. But Company D adopt it when they understand that the adoption of eco-packaging is in favour of the brand.

6.4.1 Understanding, Awareness, and Importance of Eco-packaging:

The issues caused by plastic waste all over the world can be resolved through eco-packaging. The expanded producer duty for packaging and trash management is governed by legislation in every nation. To reduce manufacturing and packaging waste and protect the environment for all current and future generations of humans, these nations have imposed various taxes on producers. Company D's innovation manager explains it in his words:

Participant D2: Eco-packaging is a name that is given to the eco-change in the packaging after the backlash against plastic. Countries around the world are concerned about single-use plastic packaging waste and announcing their policies to decrease this waste and improvement in the waste management system. Some countries are following international standard organisations guidelines and others have their targets, fees, and taxes for the non-recyclable packaging materials in their country. Sustainable packaging, green packaging, and eco-packaging are some alternatives for plastic and non-recyclable packaging. These concepts originally belong to the international standard organisation extended producer responsibility policy. According to this EPR for packaging policy producer is responsible to pay for their packaging collection, sorting, and disposal and its impact during its whole lifecycle.

Similarly, marketing manager knowledge about the same is that:

Participant D2: “Plastic is causing many natural climates like a flood, ozone deterioration, cyclones, and danger for sea habitats. All these problems lead to the establishment of corporate social responsibility and extended producer responsibility laws. Extended producer responsibility (EPR) for packaging proposed producers to think about eco-designs for less packaging waste and less environmental effect of packaging. This eco-design approach is now known as eco-friendly packaging innovation or sustainable packaging”.

Producer responsibility obligation advocates for eco-design from the producers. Eco-design can also be termed as environmental design that saves the environment from its deterioration, which is caused by production emissions and waste. Plastic as a traditional packaging material was good when research and knowledge were not available that how plastic is impacting human health, natural resources, and climate but now when we have all the knowledge that the negative impacts of plastic are much worse than its benefits so international standard organisation also raise its voice to bring changes that are need of time.

The eco-packaging is an important instrument for waste management so that we can keep our waters and land clean from packaging waste. This is also clarified by the innovation manager of Company D as:

Participant D1: Eco-design concept came into existence when the international standard organisation introduced extended producer responsibility for packaging law. This law put waste responsibility on producers for their products same as its corporate social responsibility. Producers were held responsible to pay for their waste collection, sorting, disposal, recycling, and landfill as per the amount of waste they are generating. This increase in cost gave an idea of replacing plastic and other harmful materials with biodegradable or recyclable materials so the company can arrange its collection facility themselves to reuse it and decrease its waste management cost.

6.4.2 Types of Eco-packaging for the food and drink sector

Interview participants were questioned about different features and types of eco-packaging that they consider eco-friendly packaging. The questions related to this section were introduced to the participants to get knowledge about numerous eco-packaging materials available in the market and is adopted by their own companies and other companies in the same sector. Their replies are proof that eco-packaging adoption is existed in the food and drink sector and case companies.

Table 6.7: Types and features identified by Case D participants for eco-packaging

Participant	Reuse	Renew	Reduce	Recycle	Recover
D1				✓	
D2	✓				
D3	✓		✓	✓	
D4			✓	✓	
D5		✓		✓	

Participant	Paper Packaging	Metal Packaging	Edible packaging	Consumer-waste	Cardboard Packaging	Biodegradable Packaging

				recycled Packaging		
D1						✓
D2	✓		✓	✓		
D3	✓					
D4						✓
D5						

The above table is explaining the different types and features of eco-packaging innovations that are commonly adopted in the food and drink sector. Interviewees explain what kind of features they think should be existed in packaging to be suitable for food or drink packaging. They also talk about different features that existed in the eco-packaging being adopted by their own company. The following quote is proof that company D is replacing plastic with biodegradable, recyclable eco-packaging.

Participant D4: *“We are replacing existing plastic with compostable, biodegradable, and recyclable materials and for successful implementation, we are investing in consumer education, recycling infrastructures, and research for environmental innovation in packaging”*.

But none of the participants from case D talked about recoverability features, metal-based packaging, and cardboard packaging. One of the participants explains why paper packaging is not a good option for their company as:

Participant D5: *“Paper packaging is biodegradable, so we replace some product packaging with paper board, but food products can make packaging wet very early. We cannot use paper packaging for those products. Thus, we have aimed for packaging sustainability therefore we are considering many options for improvement in the environmental aspect of packaging”*.

6.4.3 External Drivers for Eco-packaging

The following figure is an evidence map to explain external drivers for the adoption of eco-packaging. Market expectations and stakeholders are highlighted as they emerged as new external driving factors.

Table 6.8: Evidence Mapping for the External Drivers for Eco-packaging adoption (Case Study D)

Key finding Evidence for Case D	Second-Order Themes	External Drivers
<p>Buyers are also aware of the cause behind health problems and degradation of natural climate therefore they are also creating demand for eco-materials instead of plastic.</p> <p>There are some eco-consumers, the people who care for the environment who are paying more price for products that have reusable, innovative, and recyclable packaging. These people are also bringing their reusable shopping bags from home on every trip for shopping. Such people are creating pressure and demand for environment-friendly packaging and less waste of resources. They also raise questions about the delivery services that use a huge amount of packaging for transport purposes.</p>	Customers Demand	
<p>The competitive environment is also creating a fear of losing customers especially if you are not early movers in the market therefore thinking about packaging recycling and sustainability is also to have a better image in the market and face tough competition. Somehow competitors as early adopters are also motivating others to use new packaging after getting a first mover advantage in the industry, but those examples are quite a few rights now in the case of innovative packaging.</p>	Competitive Pressure	
<p>We are getting experience from different parts of the world from their extended producer responsibility plan and based on that experience we are making recommendations for improvement in EPR for packaging policy in the UK.</p>	Environmental Regulations	

Stakeholders also demand sustainability practices to improve environmental performance for improvement in company image, and their revenues in terms of increase in share prices.	Stakeholders	
Companies have only one option to survive in the market which is to change their packaging materials following market and customer demand.	Market Expectations	
Source: Derived from empirical data		

6.4.3.1 Competitive Pressure

Competition always exists in the market between different brands. This competition has also an impact on the eco-packaging adoption and packaging-related environmental strategies by different companies. These companies are using their environmental initiatives as marketing tactics to improve their image. Fear of losing customers or market position due to competitors is a big force behind the thinking of environmental packaging adoption.

Participant D2: *“Competitive environment is also creating a fear of losing customers especially if you are not early movers in the market, therefore, thinking about packaging recycling and sustainability is also to have a better image in the market and facing tough competition”.*

A similar fact is explained by another respondent of case D as:

Respondent D3: *“Somehow competitors as early adopters are also motivating others to use new packaging after getting the first-mover advantage in the industry, but those examples are quite a few rights now in case of innovative packaging”.*

Competition increases if companies are operating internationally, the number of competitors increases and the fear of losing market position also become more prominent as compared to the local market for any company.

Respondent D5: *“Food and drink industry is quite a bug with many companies that are working nationally and internationally, these companies create a competitive environment for the other company selling the same products. If one company is using eco-packaging the other will also feel the need of such move so that they can claim their love for the environment to stabilise their market position”.*

6.4.3.2 Customers Demand

According to the research participants, if customers are committed to the environment and demand eco-design for packaging and the company is not responding timely to their demand, it will harm loyalty and sales. Because environmentally conscious consumers are willing to pay more for packaging that produces less pollution, emissions, and waste. The quote below will verify this argument:

Participant D4: *“There are some eco-consumers, the people who care for the environment they are paying more price for the products that have reusable, innovative and recyclable packaging. These people are also bringing their reusable shopping bags from home on every trip for shopping. Such people are creating pressure and demand for environment-friendly packaging and less waste of resources. They also raise questions for the delivery services that use a huge amount of packaging for transport purposes”*.

The increase in research on different environmental materials that can be used as packaging raw materials has also increased consumers' knowledge regarding the importance of abolishing traditional packaging and forcing companies to introduce eco-friendly packaging materials.

Participant D3: *“People around the world are also aware of environmental degradation and deterioration of natural climate they are also demanding green packaging for products to reduce waste by giving their opinion in form of different educational and industrial research”*.

The respondents all concurred that customers are aware of the effects of packaging waste on the environment, human health, and other factors. These customers are demanding better packaging that will less impact n climate, health, water, and other natural resources. The following quote is proof of this fact:

Participant D5: *“Consumers are also showing concern and awareness for the environment, people want to save the natural climate, seas, and their health and for that, they are demanding green practices and packaging from companies”*.

6.4.3.3 Environmental Regulations

There are different environmental regulations in different countries of the world. Some companies are following international laws and regulations some have their regulations for packaging and waste management. But all countries have one motive behind these regulations which is to decrease waste, save natural resources, and less damage to water, land, and human health because of product packaging. As an international organization company D is making

efforts to give recommendations to the UK government for the improvement in their extended producer responsibility policy.

Participant D4: *“We are getting experience from different parts of the world from their extended producer responsibility plan and based on that experience we are making recommendations for improvement in EPR for packaging policy in the UK”.*

6.4.4 Managerial Environmental Awareness

6.4.4.1 Environmental Risk Awareness

Regarding the knowledge of environmental risk by the manager, most of the participants agreed that the manager's behaviour regarding risk has a direct influence on his decision for eco-packaging adoption. If he considers taking a risk in terms of changing product or brand packaging is not a big risk, if it is related to the environmental impact of their firm. Then he will agree with the fact that the adoption of eco-packaging is not a bad decision for the firm. The firm employee believes that:

Participant D1: *“If the manager is bold, confident, and daring for his decisions then he is also ready for unexpected results and top management has all knowledge about eco-innovation and its environmental benefits, they will not be scared to implement eco-packaging for food and drink products and face the results. sometimes competitive management and environmental certification increase managers' confidence for innovation adoption”.*

But still, only one manager cannot dominate the packaging changing decision by the firm. As packaging is also a part of the transportation, storage, marketing, and waste management strategy of the company. Thus, one manager can have a strong point of view on the packaging, but the adoption decision is the collective decision of many departments. This can be seen in this quote:

Participant D3: *“Environmental managers or research and development manager are not responsible to decide alone for changing product packaging. They are authorised to take strategic decisions for the environmental performance of the company. But they must consult the packaging development manager, marketing team, supply chain manager, and innovation manager for eco-packaging. Because packaging is not only for product protection, but it has marketing, storage, and transportability requirements as well. The decision to change packaging will only be implemented when all managers are satisfied from their side that they can fulfil their part of obligation through innovation as well”.*

6.4.4.2 Environmental Benefit Awareness

The management is aware of the company's environmental expenses and the advantages of adopting eco-packaging to reduce these costs, according to some of the respondents. In the comparison between cost and benefit, they are agreed that benefits, in the long run, are far more than the current investment expenditures therefore the company is in favour of eco-packaging. One respondent explains it in the following words:

Respondent D1: *“Managers have knowledge about company finance and budget that the company wants to spend on eco-innovation and environmental sustainability. So, he can evaluate the benefits of eco-packaging adoption and the costs a company is bearing for its waste management by coinciding with the environment management budget by the company. Our manager thinks that this investment in eco-packaging innovation will bring monetary benefits, he is in favour of eco-packaging adoption”.*

Personality traits regarding risk have a direct impact on the decision-making process. Company managers and top management is agreeing to take the risk by keeping an eye on the market situation and different packaging-related strategies by the competitors. The respondent clarifies it:

Respondent D4: *“The cost and benefits knowledge are also linked with risk taken and risk aversion personality traits. If the top management team is always in favour of risk-taking decisions for the company, they will advocate the adoption of eco-packaging even if it is costly but if they are risk averse, they will not favour spending money on costly materials before the other companies in the market”.*

The ability to influence those who participate in the company's decision-making process belongs to an environmental manager. A respondent from company D admits that their environmental manager influences the eco-packaging adoption decision by his strategic knowledge regarding environmental responsibility and the environmental effects of the business' operations, and his company is currently switching from plastic packaging to eco-friendly alternatives. He confirms that:

Participant D2: *“We are at the initial stage of replacing our packaging with recycled materials and increasing recycling of our packaging waste. This change was recommended by the environment manager of the company as it does not require a sudden big investment, so company directors cumulatively accept the manager's decision for this change in packaging. We discuss different sustainable packaging to replace our old packaging, but it was not in the*

current budget and was also not an intelligent decision due to the nature of our products. Thus, managers and their knowledge about finance and costs are important for a company as their decision always comes with the answer to the questions that what was the reason behind his decision, so he always can convince higher level management to implement his decisions”.

6.4.5 Eco-capabilities

The research findings show that all research participants agreed on the three important firm internal capabilities for the implementation of eco-packaging innovation through the firm.

6.4.5.1 Technological Capabilities

The findings indicate that technological capabilities are important to successfully adopting eco-packaging innovation by the company. Technological innovation helps the company to improve its environmental packaging and achieve desired results in terms of sustainability and waste management. One of the respondents from case company D confirmed it by the following quote:

Respondent D2: “We have also adopted technological innovation that is helping us to improve our bottle shapes, and features, using more recycled material in bottles and decreasing CO2 emissions. This new technology is also helping us to reduce our food waste. Technological innovation is also helping firms to reuse recycled materials by using fewer energy resources to reduce costs. In the case of packaging materials paper, plastic, cotton, metals, and so on have a piece of specific machinery to change them into packaging we cannot use only one same machinery for all types of materials. That is the main reason for a company to bring new technology for that new packaging material”

The responders stress that adopting various eco-innovations is made easier by the use of modern technology, which also has several advantages for the environment.

Respondent D4: “Almost all types of eco-innovations have the same reasons for adoption therefore one thing that is common between them is eco-technology or technological innovation. The new innovative technology allows firms to reduce their greenhouse emissions, energy and water use, and waste. Along with that research and knowledge, financial capability and employee management are essential for the implementation of eco-innovation decisions”.

As part of its approach for adopting eco-innovation, the case firm D has invested in the new eco-technology.

Participant D4: *“We have invested our money in our partner companies that are working on the new eco-technology invention and improving recycling infrastructure for an increase in recycling rates”*.

6.4.5.2 Human Capabilities

a. Health and safety:

Health and safety measures are not directly linked to eco-packaging by the respondents, but they agreed on the fact that it has a certain level of importance for the company for the smooth adoption of innovation. Only one respondent from the case D linked it with eco-packaging by saying that:

Respondent D5: *“Health, and safety training, and solving their confusion regarding any aspect of new packaging”*.

b. Employee training

One participant linked employee training with loyalty, job confidence, and better execution of eco-strategy by the company.

Respondent D2: *“For eco-friendly packaging materials employees are trained for using new technology, they have been informed about the usage of different resources”*.

Many respondents from case company D claims that their company has invested in employee training after the introduction of new innovative technology and new packaging.

Respondent D4: *“Every employee is regularly trained for the use of every new technology related to eco-innovation and recycling”*.

c. Employee Knowledge

The improvement in employee knowledge regarding a new change and introduction of new technology is necessary, without that it is difficult for a company to implement its strategy efficiently.

Participant D5: *“Human resource capabilities for eco-packaging begin with the knowledge and education of employees for the packaging-related environmental strategy”*.

While adopting eco-packaging, Company D plan to educate its employees regarding the change that are implemented as the company s’ new packaging strategy.

Participant D3: *“Our company after changing plastic to polyethylene, paper, and paperboard packaging arrange seminars and workshops for employees so that they can have answers to the questions in their mind about this change in packaging materials”*.

6.4.5.3 Research and Development Capabilities

All case study D respondents agree that research and development for eco-innovation is essential to the implementation of eco-packaging innovation. Therefore, companies are investing in different research for a better future. They validate their claim during the interview with the following quote:

Respondent D1: *“We are investing in educational institutes to support our sustainability initiative by using research for improvement in recycling knowledge and invention of sustainable materials that can help in social, economic, and environmental sustainability. Our investment in research for innovation will help us to invent and adopt sustainable packaging in near future. For that, we have already done an investment in research and development”*.

Participants agreed that there is a positive connection between research and the adoption of eco-packaging. Company D is using research and is proved by the following as said by the respondent.

Respondent D3: *“Research includes collecting knowledge about different eco-friendly, recyclable, reusable, and biodegradable materials that are suitable for your food and drinks and fulfill your marketing and shipping requirements. You will obtain knowledge of the origin of those new eco-friendly materials, technology requirements linked with those materials, temperature, handling, water and fire resistance, and material cost”*.

It is further added that:

Respondent D5: *“Research for packaging designs that can decrease waste by using less raw materials and less natural resources. Research for new packaging innovations in form of better alternatives of plastic that have recyclability and biodegradability features. Adoption of new technological innovation makes a firm capable of improving its environmental performance by fewer air emissions, less water and energy use, and less waste in form of landfills”*.

Respondent D4: *“Our investment in research and development is helping us to stack our snacks and chips in such a way that we can reduce the size of their packaging. We are continuously doing research for our non-recyclable snack wrappers and drink labels”*.

6.4.6 Green Marketing

The participants from Company D concur that environmentally friendly packaging innovation directly influences green marketing. and their company is using promotional green marketing

tools as their communication strategy after replacing their old packaging with eco-friendly packaging. One of the interviewees from this company said:

Participant D1: *“Our company is using nearly all marketing tools for communicating our efforts for removal of plastic and waste management to consumers, and the government”*.

One of the participants highlights the partnership between the company and the TV channel for spreading environmental efforts made by the company and its love for the environment. As explained by a participant:

Participant D4: *“Our partnership with the national geographic TV channel is for environmental education and love for the planet”*.

6.4.6.1 Environmental Advertisement

Many participants talk about environmental advertisement as another green marketing promotional tool by their company. Companies are using these commercials to reach out to customers and share their commitment to the environment and corporate initiatives. The quotes, below, is the evidence that the company is using environmental advertisement to communicate with its customers.

Participant D2: *“We are using all media of communication to convey our message and efforts to the consumers including TV”*,

6.4.6.2 Eco-labelling

The data analysis also shows that the company is using eco-labeling as a means of communication to spread recyclability, reusability, and other features that are making their packaging eco-friendly. Company representatives explain it as:

Participant D1: *“Packaging is also labeled with recycling and reusability instructions to educate buyers for appropriate disposal of packaging waste”*.

Another participant explains it as:

Participant D5: *“Our packaging is designed after collecting information and scientific data for different materials to estimate the impact of packaging on the environment. Our packaging contains clear and easily understandable consumer instructions for reuse, renewal, and recycling of packaging”*.

6.4.7 Green Image:

Participants in the study revealed how adopting environmentally friendly packaging innovations is enhancing their image in the food industry.

Participant D1: *“Eco-packaging and eco-technology help to decrease emissions and in efficient use of natural resources like water and energy, that resultantly improve company image”*.

Participants cited that gaining environmental performance and an increase in revenues is also linked with eco-friendly packaging.

Participant D4: *“It means eco-packaging can help us to generate more income with a green image and better environmental performance”*.

6.4.8 Waste Prevention:

The research participants also identify that eco-innovation in packaging also has a social impact in terms of waste reduction. They identified different green features of eco-friendly packaging that are directly or indirectly linked with waste reduction. The reusability feature is explained by one of the waste reduction features of the company C packaging by one the participants.

Participant D3: *“We are happy that our reusable food packaging is washable and reusable therefore, many of our food product buyers are reusing our packaging containers as storage containers for many other things in their home, as ornamentation by using DIY techniques in the home, as makeup storage boxes and many other ways”*.

Another interviewee quoted it as:

Participant D3: *“We are using reusable packaging for our food products and customers are using them again for storage purposes in the home which is decreasing waste”*.

CHAPTER 7

CROSS-CASE ANALYSIS AND DISCUSSION

7.1 Introduction

Comparing cross-case analyses for four corporate examples in Chapter 7 helps to clarify the ideas from Chapter 6 in more detail. In research involving multiple case studies, cross-case analysis is important because it increases the relevance of the findings to analogous contexts (Miles and Huberman, 1994). Glaser and Strauss, (1967) also emphasize the use of cross-case analysis especially when the research is based on grounded theory because it helps the researcher to expand and intensify the explanations for a better understanding of research results.

In this chapter, the differences and the similarities of interviewee opinions are explained. The arguments and explanations given by interviewees are compared with the theoretical propositions formed earlier in chapter 4. This chapter also explains a few new themes that emerged because of the researcher's repeated data analysis of the interview materials. A new theoretical framework is suggested at the end of this chapter based on the pre-existing theoretical assertions and the new subjects.

The interview data is rigorously examined to identify similarities and differences between all four cases A, B, C, and D (Eisenhardt, 1989). Simply, this chapter is discussing the important information received by the research participants regarding their understanding and point of view on the adoption of eco-packaging, the driving factors, and the impact of this acceptance by the food and drink manufacturing companies. In addition, the research framework created following the data analysis has assisted the researcher in responding to all of the research questions formulated in chapter 1.

7.2. Comparison between the four study cases

To understand that four selected case companies know about the adoption of eco-packaging/ packaging eco-innovation, the researcher ask a simple question to each study participant about his understanding of eco-packaging or eco-innovation in terms of packaging. this question also helps the researcher to understand how much information and knowledge the selected research

participants have for eco-packaging and the study is moving in the right direction by interviewing the right participants from each company.

The findings are discussed under four major themes identified as external drivers, managerial environmental awareness, internal eco-capabilities, and outcome of the eco-packaging adoption. The analysis is built on the arguments given by all four case participants to have rich explanations of eco-packaging innovation for food and drink manufacturing companies. All case companies have their packaging manufacturing unit except case D.

Table 7.1: Definitions of Eco-packaging by the research participants

Research Participants	Quotations for Eco-packaging
Research Participant (Case A1)	<i>“The packaging that is made of naturally sourced material is eco-packaging as it is retrieved from nature so it will be very easy to dispose of it off naturally without harming the environment. All recyclable materials-based packaging can be categorised as eco-innovation in packaging. It also includes PE Plastic, recycled paper, recycled cardboard, cloths, metal, wood, agriculture products, and seaweed used as packaging”.</i>
Research Participant (Case A2)	<i>“Eco-innovation in terms of packaging means eco-friendly packaging that is less harmful to the environment, and it is produced by using fewer natural resources and with fewer emissions in the air, soil, or water. For instance, Edible Packaging- polystyrenes, paper, reusable, recycle, renew materials”.</i>
Research Participant (Case A3)	<i>“Eco-innovation in packaging means changes in the packaging material and packaging production process based on traditional packaging environmental impact”.</i>
Research Participant (Case A4)	<i>“Eco-innovation in terms of packaging is all about positive change in the packaging that makes it more environment friendly. Eco-innovation in packaging is all about changes in the packaging by keeping environment into consideration”.</i>
Research Participant (Case A5)	<i>“Eco-innovation in packaging is all about improvement in the packaging material for the sake of making it more environment approachable. as per my understanding and knowledge any kind of change in the packaging is termed is eco-innovation that make it easily disposable, and less harmful for the</i>

	<i>environment at any stage of its life cycle. Such changes are a part of sustainable and waste management practices around the world”.</i>
Research Participant (Case A6)	<i>“Eco-innovation in terms of packaging is getting rid of plastic and other harmful packaging materials that are very difficult to dispose of. We can take it as a change in packaging that makes it greener. I can explain green as environment, the eco-packaging should be in such a form that it has less waste of natural resources and fewer emissions to the environment during its whole life”.</i>
Research Participant (Case B1)	<i>“Eco-innovation is a form of sustainable innovation and eco-packaging innovation mean the introduction of sustainability practices in term of packaging by improving packaging lifecycle. This new packaging can be named sustainable packaging, eco-packaging, or green packaging. These new features are designed to decrease packaging waste and removal of plastic from the earth as packaging material”.</i>
Research Participant (Case B2)	<i>“Eco-innovation is an alternative term for green and sustainable innovation. All these words have the same meaning in terms of environmental change in packaging. As per my knowledge packaging innovation is any kind of change in packaging to make it better and eco-packaging innovation is changing in the packaging specifically to save nature and the world”.</i>
Research Participant (Case B3)	<i>“Eco-packaging is a part of eco-innovation that is also termed as sustainable innovation, green innovation, or environmental innovation. Packaging eco-innovation means making packaging more sustainable or green. It includes any change in the packaging for the sake of saving the environment by adding some characteristics in the packaging that leads to decrease packaging waste and save environment on each stage of the lifecycle of that packaging”.</i>
Research Participant (Case B4)	<i>“Eco-innovation in packaging means adding sustainability features in packaging that helps in the process of saving nature or the natural environment. Different other terms are common in literature when we talk about environmental aspects of packaging. Simply I can say that green packaging, sustainable packaging, eco-packaging, eco-friendly packaging innovation, and environment packaging all have the same meanings with more or less different characteristics. But basically, they get their origin from sustainability and circular economy concepts”.</i>

Research Participant (Case B5)	<i>“For me, eco-innovation is eco-change in packaging to make it more friendly for nature. Such packaging is often termed green packaging by linking it with the colour of nature. Innovation means newness, in terms of eco-packaging it should not be completely new or completely changed to be eco-innovative although any small change in current packaging that leads to fewer emissions, less waste, zero waste, and proper recycling makes that packaging eco-packaging”.</i>
Research Participant (Case B6)	<i>“Eco-innovation in packaging means any kind of innovation in packaging that has been made by keeping in mind the environmental impact of that packaging. It can be any small or big change, but the main aim of this change is to improve existing packaging to fulfil the environmental commitments made by the company. For example, our company is shifting from plastic packaging to recycled plastic that has a low environmental impact because of fewer emissions and its ability to dispose of easily”.</i>
Research Participant (Case C1)	<i>“Plastic waste takes a long time to completely dispose of. Additionally, there was no proper collection and management of such packaging waste that can be sorted via recycling. These problems demand thinking about plastic so that if we cannot manage its whole life cycle then we can use alternative materials as packaging that will be easy to manage after use and this change in materials is all about eco- packaging. these changes are often termed as environmental characteristics and the packaging with environmental characteristics is called eco-packaging”.</i>
Research Participant (Case C2)	<i>“Eco-packaging innovation refers to the characteristics of product packaging that are linked with environmental protection. It means that the packaging is creating less waste, there is less emission of harmful gases during the whole life cycle of that packaging, and it has recyclability, reusability, recovery, and renewability feature. Such packaging is called eco because of its environmental safety features. This new eco-innovation in packaging is introduced to replace it with plastic”.</i>
Research Participant (Case C3)	<i>“Eco-packaging is any type of packaging that is environment friendly, can be easily recyclable, is safe for the human and earth, have less material in quantity, and is made by using recycled materials. The production of such packaging uses fewer natural resources, less water, and less energy. This eco-</i>

	<i>packaging can also be termed as green packaging, environmental packaging, or sustainable packaging”.</i>
Research Participant (Case C4)	<i>“Eco-innovation means innovation or change for the environment so eco-innovation in packaging means bringing environment-related change in the packaging. it includes the introduction of environmental features in the packaging like recycling, reusability, renewal, and any other element that is linked with a reduction in packaging waste or can lead to less elimination of dangerous gases into the air during the whole life cycle of packaging. Eco-packaging did not also have any harmful impact on air, water, and soil during its disposal stage”.</i>
Research Participant (Case C5)	<i>“Eco-packaging is made of recyclable and biodegradable materials and by using eco-technology. The use of eco-technology will lead to less water and air pollution by fewer air emissions and less waste. It should also have all packaging features including attraction for consumers and is available at an affordable price so that it will not affect product price by a huge margin. In a simple world eco-packaging should be environment friendly, and along with that satisfy product, consumer and producer needs”.</i>
Research Participant (Case D1)	<i>“Eco-packaging innovation means using recyclable and reusable packaging for closing the production loop to decrease waste. This eco-packaging innovation is also termed green packaging or sustainable packaging. there are different environment-friendly materials are replacing plastic to be used as eco-packaging due to their biodegradability and renewability. Conclusively, we can say that eco-packaging is a solution for packaging waste and multiple problems linked with plastic packaging”.</i>
Research Participant (Case D2)	<i>“Eco-innovation in terms of packaging means that you are trying to make your packaging recyclable and reusable so that you can do less damage on earth in form of less waste. it can also include efficient use of energy resources during packaging manufacturing and fewer footprints during the whole lifecycle of that packaging for less impact on the community, country, or world”.</i>
Research Participant (Case D3)	<i>“The eco-innovation in packaging differs from industry to industry depending upon their needs and packaging features as apparel, shoes, mailing, household item, food, and beverage everything has its requirement for packaging. But all industries have certain features common for their packaging to be considered eco-friendly or eco-innovative. First, the packaging should less contribute to the spread of waste. Second, the packaging should have recyclability and</i>

	<i>biodegradability features. Third, it has no impact on human health and the environment throughout its lifecycle. Fourth, it has less waste of energy and natural resources or uses renewable resources during its creation. And last but not least it should be affordable and fulfil all functional needs for the product”.</i>
Research Participant (Case D4)	<i>“Sustainable packaging is also called eco-packaging if it has environmental features including recycling, reusability, reduced waste, and biodegradability. Eco-packaging cannot be sustainable packaging until it provides social and economic benefits along with environmental performance improvement. Due to its relationship with the environment, it is also termed as environmental and green packaging”.</i>
Research Participant (Case D5)	<i>“Eco-innovation in packaging is a sustainability practice to improve packaging materials from an environmental viewpoint so that the new packaging will be environment friendly, will use natural resources efficiently, have less emission and less waste during the whole lifecycle. This innovation in packaging is because of harmful effects of plastic on health, water, air, and human life”.</i>

Based on participants' responses on their understanding of eco-packaging, the study establishes the fact that three different perspectives are important to consider regarding eco-packaging.

The first perspective is the packaging features portraying the moral responsibility towards the environment and to fulfil this responsibility there should be no use of plastic in the packaging and all other features that make it more environment friendly i.e., recyclability, reusability, renewability, renewable, and reduced. These features established in the definition by most of the research participants are basic perceptions behind the adoption of eco-packaging. All research participants agree that the adoption perception is divided into three types of drivers that are further divided into sub-categories according to their connection with each driver.

The second perception is waste management perception as environmental protection is directly linked with green marketing and waste management benefits to the food companies (Research participant 5, 7, 13, 18, 19, 22). Sustainability is the third perception that is a newly emerged theme explained by a few of the research participants. They (Research participants 5, 7, 10, 21, and 22) linked eco-packaging with the sustainability initiative of the company.

7.3. Revised/Update propositions.

The data from each case are merged after completing an inter-case firm analysis to assess the parallels and divergences between the four examples. It will help the researcher to get valid and novel study outcomes. To accomplish this task a new list of propositions is developed after considering the responses given by all interviewees from four different cases. Based on the first collection of propositions the researcher generated in the research propositions chapter to guide the research, this revised list of statements. The earlier propositions based on the existing literature on eco-packaging are revised to clearly explain them in the context of food and drink companies.

This new data will help to improve and enhance the existing knowledge regarding different driving factors of eco-packaging for food and drink companies. The cross-case analysis will enhance the existing eco-packaging knowledge of food and drink companies. The first proposition addresses external driving factors (research question 1), the second proposition addresses the influence of managerial environmental awareness on the adoption of eco-packaging (research question 2), the third proposition addresses eco-capabilities (research question 3), and the fourth and fifth propositions address the outcome dimension (research question 4 and 5). These propositions are revised after inter-case company analysis and presented in the table below:

Table 7.2: Revised/update propositions.

Proposition Number	Initial Propositions (from Chapter Three)	Revised Propositions
1a.	Competitive pressure is associated with the adoption of eco-packaging innovation.	
1b.	Customer demand has an influence on the adoption of eco-packaging innovation.	
1c.	Environmental Regulations have a significant influence on the adoption of eco-packaging innovation	

1d		Stakeholders' views and opinions to introduce environmental packaging can influence the adoption of eco-packaging innovation.
2a.	Managerial environmental risk awareness can significantly influence the adoption of eco-packaging innovation.	.
2b.	Managerial cost-benefit awareness can significantly influence the adoption of eco-packaging innovation	
3a.	Technological capabilities can facilitate the process of successful adoption of eco-packaging innovation.	Technological capabilities such as new technical equipment, IT system, and innovation changes in company operations can facilitate the successful adoption of eco-packaging innovation.
3b.	Human capabilities can facilitate the process of successful adoption of eco-packaging innovation.	Human capabilities such as employee training, employee knowledge via workshops, and seminars, and employee health and safety are significant to achieving the successful adoption of eco-packaging.
3c.	Research and Development capabilities can facilitate the process of successful adoption of eco-packaging innovation.	
3d.		Organisational Collaboration via appropriate partnership can facilitate the process of successful adoption of eco-packaging innovation.
4a.	The impact of eco-packaging innovation on the green image is likely to be enhanced, by using eco-labelling as a green marketing tool.	
4b.	The impact of eco-packaging innovation on the green image is likely to be enhanced, by using environmental advertisement as a green marketing tool.	

4c.		The impact of eco-packaging innovation on the green image is likely to be enhanced, by using social media marketing.
4d.		The impact of eco-packaging innovation on the green image is likely to be enhanced, by using green message display as green marketing tool.
5.	Eco-packaging innovation can help food and drink companies gain a green image.	.
6.	Eco-Packaging innovation.is helping food and drink companies in the waste prevention process.	
7.		The food and drink companies experience financial profits because of the successful adoption of eco-packaging innovation.
8.		Customer Loyalty is also observed as an outcome after the adoption of eco-packaging innovation.
Source: Derived from empirical data		

7.4 External Driving factors and Eco-packaging

This section will explain the findings derived from four case studies regarding the external driving factors. The opinions of the interviewees are well stated in the inter-case analysis, however there aren't many recently discovered themes that came from the data analysis. It will be useful to comprehend all the contributing variables at once before describing the external driving forces. The following figure is showing three external driving factors derived from already existing literature and two newly emerged factors emerging from the empirical data. The five external driving factors for eco-packaging adoption are customer demand, competitive pressure, environmental regulations, market expectations, and stakeholders. Market expectations and stakeholders' pressure are newly emerged themes from empirical data analysis.

Figure 7.1: External Drivers themes and Sub-themes

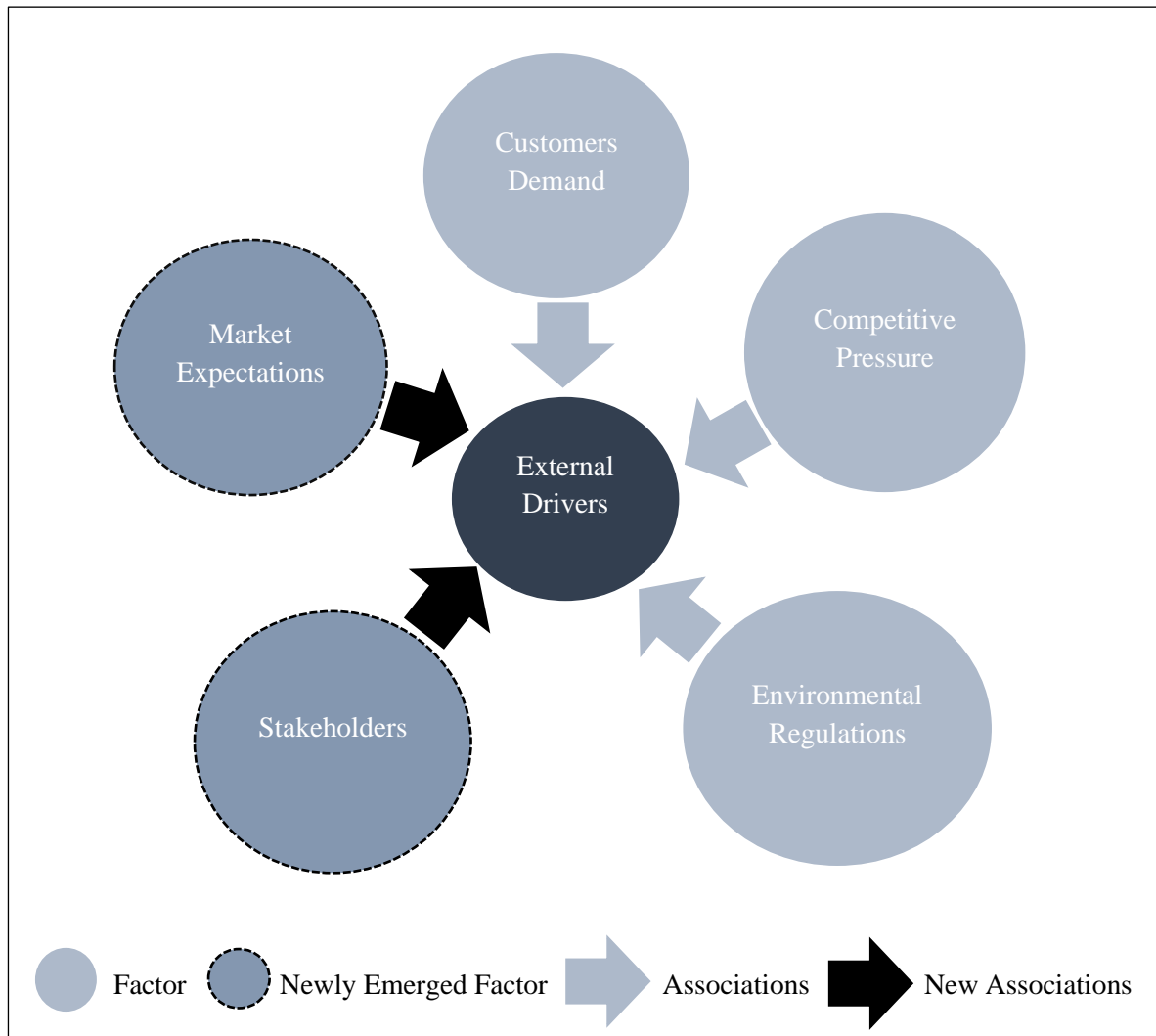


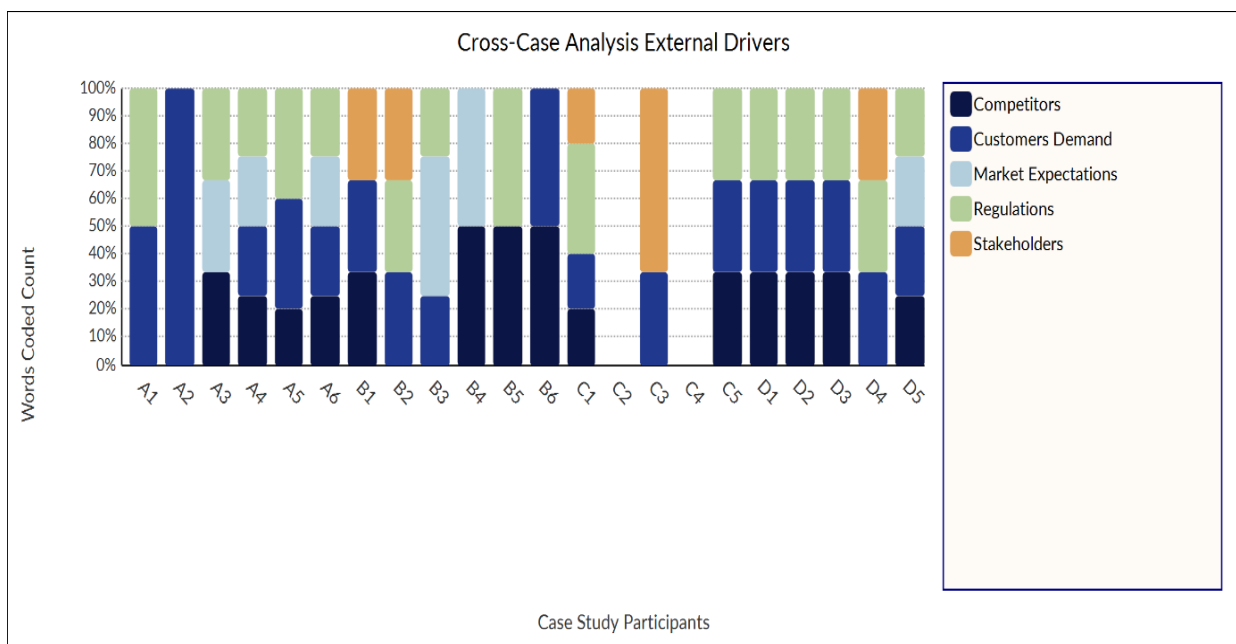
Figure 7.1: Developed by the researcher for purpose of this research.

The above mentioned five factors under external driving factors for the adoption of eco-packaging were found in all four cases with different perceptions. The experience and knowledge of different participants across these four cases explains the driving factors that they have experienced within their company regarding packaging.

Customers demand, Environmental regulations and competitive pressure are the drivers explained by already existed studies on eco-friendly packaging. This study added stakeholders and market expectations as two other essential driving factors for the companies that are putting external pressure on them to think about their packaging materials. Market expectations are linked with the decision-making process of the company. The information about market trends and future changes helps companies' managers and shareholders to take timely decision for the change in the product packaging. Stakeholders including NGO's, government authorities, and

academic research are also important influencers for the environmental changes in the packaging materials and packaging waste management. These Stakeholders are aware of environmental issues and the packaging used by the food and drink companies therefore they are contributing to the packaging changing initiatives of the companies by increasing their knowledge on plastic waste. Participants from case A and C provide information on how these academic research and NGO's explain different remedies (recycling or collection of plastic) for them to help in their packaging waste management.

Figure 7.2: Cross-Case Analysis External Drivers



From the findings, almost all participants from the four case companies (A, B, C and D) corresponded that the adoption of eco-packaging by food and drink firms is significantly influenced by external driving forces. Customers' demand and competitors. The way that food and drink firms think about eco-packaging innovation is influenced in some way by environmental restrictions. Along with these factors, these interviewees also talk about stakeholders including consumers/buyers as they are putting pressure on companies to consider their packaging as a crucial element to stay for a long-term in the competitive market. Similarly, market expectations also have an impact on the company's strategy regarding its packaging. Almost all interview participants considered customer demand, competitive pressure, and environmental regulations as responsible factors for the eco-packaging adoption by food and drink companies. Participants B1, B2, C1, C3, and D4 also talk about stakeholders as they keep their eyes on the market trends, and they questioned their companies for reasons of non-

switching from traditional plastic packaging to environment-friendly packaging for sustainability and better firm performance.

7.4.1 Competitive Pressure:

Nearly all the respondents concurred that the competitive pressure brought on by newly released innovative packaging can directly affect the company's packaging-related marketing strategy. Although many companies did not consider outside pressure as a threat still it is a big opportunity for the food and drink companies to change their traditional packaging decrease their costs and achieve inside improvement for the betterment of the firm.

The main motivator for food and beverage companies to adopt eco-packaging is acknowledged to be competitive pressure. The interviewees emphasise how the competitive pressure to go green by using eco-packaging within the food and beverage sector is producing a significant demand for company capacities for eco-innovation that is having a direct influence on the brand and its environmental performance. Some respondents indicated that through:

Participant B3: *“The most important driver in this competitive era is your business competitor, you must think before them and take your steps before them to survive in the market”*.

Participant D5: *“Food and drink industry is quite big with many companies that are working nationally and internationally, these companies create a competitive environment for the other company selling the same products. If one company is using eco-packaging the other will also feel the need of such move so that they can claim their love for the environment to stabilise their market position”*.

It was clear by all participants that competitive pressure is a real phenomenon in the food and drink sector. Companies must show their understanding and love for the environment by implementing environmental strategies in terms of their product packaging. Few participants also linked competitive pressure with the competitive advantage gained by the companies as a first mover advantage. This fact is explained as:

Participant D3: *“Somehow competitors as early adopters are also motivating others to use new packaging after getting first mover advantage in the industry, but those examples are quite a few rights now in case of innovative packaging”*.

The following claim is made following the analysis of the information gathered from all of these interviews to demonstrate how competition is one of the primary external forces pushing the food and drink sector to embrace eco-packaging.

Proposition 1a: Competitive pressure is associated with the adoption of eco-packaging innovation.

7.4.2 Customer Demand:

In earlier studies, the adoption of various eco-innovations was described as being significantly influenced by customer demand. But past studies do not explain this factor in terms of eco-packaging thoroughly. The study participants clearly explained how customers' demand for eco-packaging is putting pressure on producers for changing traditional packaging into more environmentally friendly packaging. 18 people out of 22 were seen talking about understanding customers' demand for eco-packaging and acting upon it for the increase in customer loyalty and sales. The following quotes are explaining this situation.

Participant A4: *“Customer is also a driving force but sometimes if they are brand conscious, they may not bother too much about the changes in the market but if they will be more knowledgeable and committed towards a natural environment that is the reality that they are, then it will be difficult for you to retain loyal customers without the adoption of eco-packaging”.*

Participant D4: *“There are some eco-consumers, the people who care for the environment they are paying more price for the products that have reusable, innovative and recyclable packaging. These people are also bringing their reusable shopping bags from home on every trip for shopping. Such people are creating pressure and demand for eco-packaging innovation and less waste of resources”.*

Many respondents highlighted the fact that customers are aware of many environmental and health problems created by traditional packaging materials and also the impact of this kind of packaging on the future of the earth and the coming generations. The interviewees stated that:

Respondent B6: *“Consumers are also aware of these waste management policies, plastic pollution, the effect of waste pollution on earth and human health, sea water pollution, plastic as a danger for sea mammals, deterioration of natural environment and risk of losing natural*

climate for the future generation. This awareness is creating consumer demand for no plastic and eco-packaging”.

Respondent C3: *“Environmental issues also create health problems and awareness of these health and environmental problems increases customers' knowledge of the plastic waste, emissions, and the solution of these problems. That leads to the pressure by consumers for environmental packaging materials”.*

With the findings collected from all four case studies the following proposition is placed:

Proposition 1b: *Customer’s demand has an influence on the adoption of eco-packaging innovation.*

7.4.3 Environmental Regulations

Another external driving factor for eco-packaging is environmental regulations specifically extended producer responsibility for packaging. Apart from the extended producer responsibility people from two people from case A also identified corporate social responsibility as an environmental regulation linked with eco-packaging adoption. Many respondents discussed that food and drink companies are encouraged to adopt eco-packaging by partially or fully changing their packaging material to decrease the pollution penalty and waste management costs that are existing in form of environmental regulations. The following quotes highlight the same argument:

Participant A5: *“Packaging waste is costing our business in form of government regulations regarding packaging waste disposal. Initially, it was the cost with packaging waste recovery note (PRN) and now it is named as extended producer responsibility for packaging”.*

Participant A6: *“The government regulation i.e., extended producer responsibility is increasing company costs to make it more responsible for packaging waste this increase in costs demands environment-friendly packaging materials”.*

Participant B6: *“We have our own extended producer responsibility policy for our company to decrease the cost that the company is paying on regular basis. Similarly, as a responsible producer, we are working on many other trends around the world including zero waste and circular economy practices”.*

Participants from case study D established the fact that they are still behind the other companies (A, B, and C) in terms of eco-packaging. It means environmental regulations can affect one

company more than the others since in which part of the world the company is operating its business. As in developing countries the environmental regulations for packaging waste are not as strict as in developed countries therefore, the same brand has different product packaging in two different countries. Based on the views of different respondents from four cases the next proposition can be proposed as:

Proposition 1c: *Environmental Regulations have significant influence on the adoption of eco-packaging innovation*

7.4.4 Stakeholders:

From the findings, stakeholders are found an important driving force for the adoption of eco-packaging by food and drink companies. Many of the people who were interviewed agree that these stakeholders are aware of market trends. They also believe that, in light of the market's rising eco-packaging innovation trends, it is crucial to alter the company's strategy and managerial viewpoint. Organisational stakeholders including customers, employees, and suppliers are already considered external drivers in the initial stage of the study when propositions were proposed based on the existed literature. Community stakeholders that consist of environmental organisations for making rules regarding environmental protection from packaging waste are also discussed separately as a driving force for eco-packaging innovation acceptance by the food and drink businesses.

Under this new emerging category of stakeholders, respondents talked about social media influencers and community groups who also influence change public perception by using social media and other platforms of communications. Only 7 out of 22 respondents mention these stakeholders as external drivers for eco-packaging adoption along with other drivers by the food and drink companies.

Participant C3: *“Stakeholders including social media influencers, community groups, and customers also create demand-pull pressure for the producers to deal with plastic waste and think about their environmental responsibility. We are actively working with our social media teams to identify the specific stakeholders that have an impact on our business. Our company understands the power of social media and communication networks therefore, we have identified their expectations and working continuously to meet their demand for eco-Packaging”.*

Because of this newly discovered knowledge from the examination of the empirical data, the following proposition is made:

Proposition 1d: *Stakeholders' views and opinions to introduce environmental packaging can influence the adoption of eco-packaging innovation.*

7.5 Managerial Environmental Concern

A managerial concern for the environment is the next motivating reason for eco-packaging. This is also an important contributor to this research because there are countable studies that included this factor as a driver of any kind of eco-innovation in the research. The importance of this element in encouraging food industry to embrace eco-packaging was acknowledged by all respondents. Managers as important decision-makers in the company are willing to adopt eco-packaging as an eco-innovation in the company for getting environmental and long-term financial benefits. Below are the two categories that are made to define managerial environmental concerns more thoroughly. Participants provide their thoughts on the significance of management environmental expertise for the company's eco-packaging and environmental policies. Research participants quoted it as:

Participant B2: *“Managerial environmental knowledge and concern also advise to change in business strategy as in case of eco-packaging our company managers were aware of EPR for packaging costs and the existence of demand for environment-friendly packaging so they create an internal pressure on company directors to bring a new framework where we can change our packaging for better revenues in future”.*

Participant B3: *“Manager 's knowledge and opinion for the adoption of eco-packaging is important”*

Participant C1: *“At each production place production manager and environmental manager with the help of the marketing manager is responsible for environmental decision making. These managers have strong opinions for eco-packaging and other eco-innovations and based on those decisions company draw its environmental strategy”.*

Participant D4: *“Managers attitude towards the environment can positively impact his decision for implementation of environmental practices inside the company. With the help of accurate knowledge and reasoning for the usage of specific eco-packaging he can convince higher level management to implement their decision”.*

Figure 7.3: Cross-case Analysis Managerial Environmental Concern:

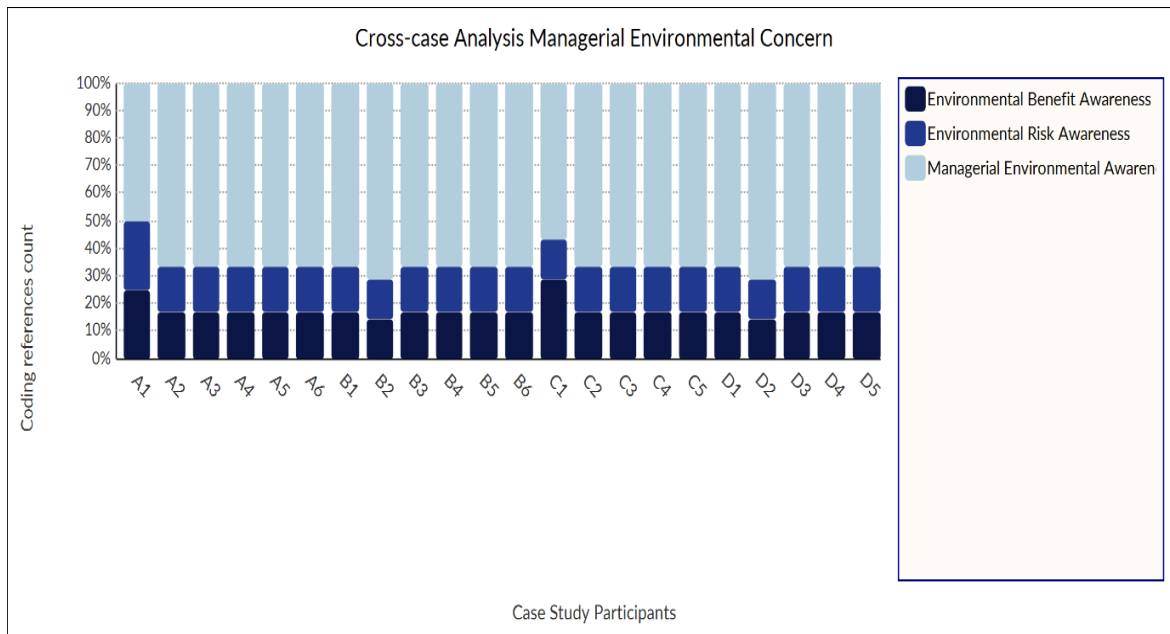


Figure 7.3 is created using NVivo and displays the main theme of managerial environmental concern and sub-themes of environmental risk awareness and environmental benefit awareness by the managers. This figure is analysing the coded content for the theme of managerial environmental awareness and its sub-themes across all the cases.

The company's response to the adoption of eco-packaging is positively impacted internally by managerial environmental awareness. However, we can see that the above figure is explaining that all participants have their opinion and knowledge for both sub-themes of managerial environmental awareness. The views of all participants are based on their experience while working in their companies when the company decides to switch from traditional packaging materials to eco-materials so that their packaging can be called eco-packaging based on the features of the new eco-material. The detailed discussion regarding this diagram is given below based on their related specific propositions.

7.5.1. Environmental Risk Awareness:

All interviewees agree that managerial knowledge regarding the risk, issues, and environmental problems created by packaging materials and waste is an important source of its adoption these days. Managers with huge data and knowledge regarding eco-innovation, understand the risks

attached to traditional packaging materials and the importance of eco-packaging based on its benefits for the company and industry. As explained by the interviewees, managerial risk awareness is the factor that is linked to environmental regulations. According to the respondents' managers understand the laws and regulations that existed in the industry and country for eco-packaging by linking it with waste reduction. The managerial risk awareness regarding the adverse impact of packaging on human health, oceans, the environment, and companies makes them more in favour of eco-packaging adoption. The same fact is explained by different respondents:

Participant C4: *“Our company managers know that when the companies were using plastic as packaging, they were not considering its environmental damages. But now they have enough knowledge about why environmental and public organisations are promoting eco-friendly or sustainable packaging. The benefits of eco-packaging adoption include less CO2 emissions, energy savings, less water waste, recycled material saving money, easy waste management, and fewer costs to pay in form of packaging legislation fees. Managers are now aware of all environmental and business benefits of eco-packaging and their knowledge is enough to agree directors, stakeholders, and CEOs decide on such eco-innovation adoption”*.

The interviewees also talk about environmental managers that are specifically hired by the companies for environmental performance management. They are well-equipped with the necessary eco-innovations for the sector, and they are playing a significant role in the choice of eco-materials and eco-design modifications for the company's product packaging.

Participant B2: *“A manager is an important person for any type of eco-innovation adoption decision. As every manager's knowledge is different from another department manager thus, different managers collaborate for taking a final decision”*.

Participant B4: *“Environmental managers collect market knowledge on available eco-packaging materials after that he collaborates with business partners for their knowledge on current packaging. His next step is to sketch the plan for the adoption of eco-packaging based on the specific features needed for the product. He estimates how much innovation in packaging will be easily adoptable for a specific brand and how much change will be required in form of technology and resources for new eco-packaging. After considering all alternative packaging options, requirements for packaging to be environment friendly and getting data for emissions and energy and water usage of that specific eco-packaging he decides to adopt it”*.

Participant D4: *“Environmental managers and packaging development managers are responsible to keep their eye on the packaging and its image on the company’s market image. They both understand that plastic is not an acceptable packaging material due to its negative effects on humans and the earth. They also know that they must think about new packaging that is using environmental materials and have a better design for less use and waste of resources. This thinking for better environmental packaging is bringing managers to the conclusion of using green packaging or eco-packaging”.*

Proposition 2a: *Managerial environmental risk awareness can considerably encourage the adoption of eco-packaging innovation*

7.5.2. Environmental Benefit Awareness:

After analysing the interview transcripts of all four companies’ employees it was possible to understand a clear link between the managers' environmental risk and the benefit related to eco-packaging awareness and his decision for the change in traditional packaging. Different respondents agree that higher managerial environmental cost awareness means the manager agreed that if his company is focusing on eco-packaging in terms of environmental benefits and reduction in waste management costs, he will be more likely to be in favour of eco-friendly packaging materials. It will also help the company to meet environmental regulations such as EPR.

Participant A1: *“In terms of packaging the firm evaluates the cost and benefits that if company switches from traditional plastic to no packaging or eco-packaging what will be pros and cons for the company and the product. It took months to collect data and information for the company to decide whether it is the time to adopt eco-packaging or not”.*

Participant C5: *“Environment manager must work with his environment strategy budget; therefore, he collects all relevant cost data for any environmental strategy related change inside the company”.*

Interviewees also mention that the investment cost of eco-packaging will also help the company to gain long-term financial benefits. Additionally, this investment will help a company to decrease the raw material cost as the firm will reuse its eco-materials after recycling. One-time

investment in eco-packaging will result in a decrease in raw material and waste management costs in the future.

Participant B2: *“Manger knows that company is paying packaging waste recovery and recycling costs to the government and private companies therefore, his suggestion to improve packaging is to decrease in recycling fee and use recycled material as raw material to decrease raw material expenses”*.

Participant B4: *“Manager’s role is to defend his adoption decision by comparing the cost that the company is bearing for the waste management and investment in waste collection to the benefits that eco-packaging adoption can bring by a reduction in these costs linked with already used packaging waste management. He also defends his decision based on long-run benefits that the company can get after eco-packaging adoption in form of improved company image, loyalty, sustainability, and profits”*.

Participant C1: *“The producer responsibility fee that the company is paying for packaging waste is also company cost and the manager compares this cost with the cost increment for the adoption of eco-packaging. this comparison provides him the best estimate of current adoption of eco-packaging and in future getting benefits of this adoption in terms of decrease in EPR fee and profits in terms of increase in customer loyalty and future sales”*.

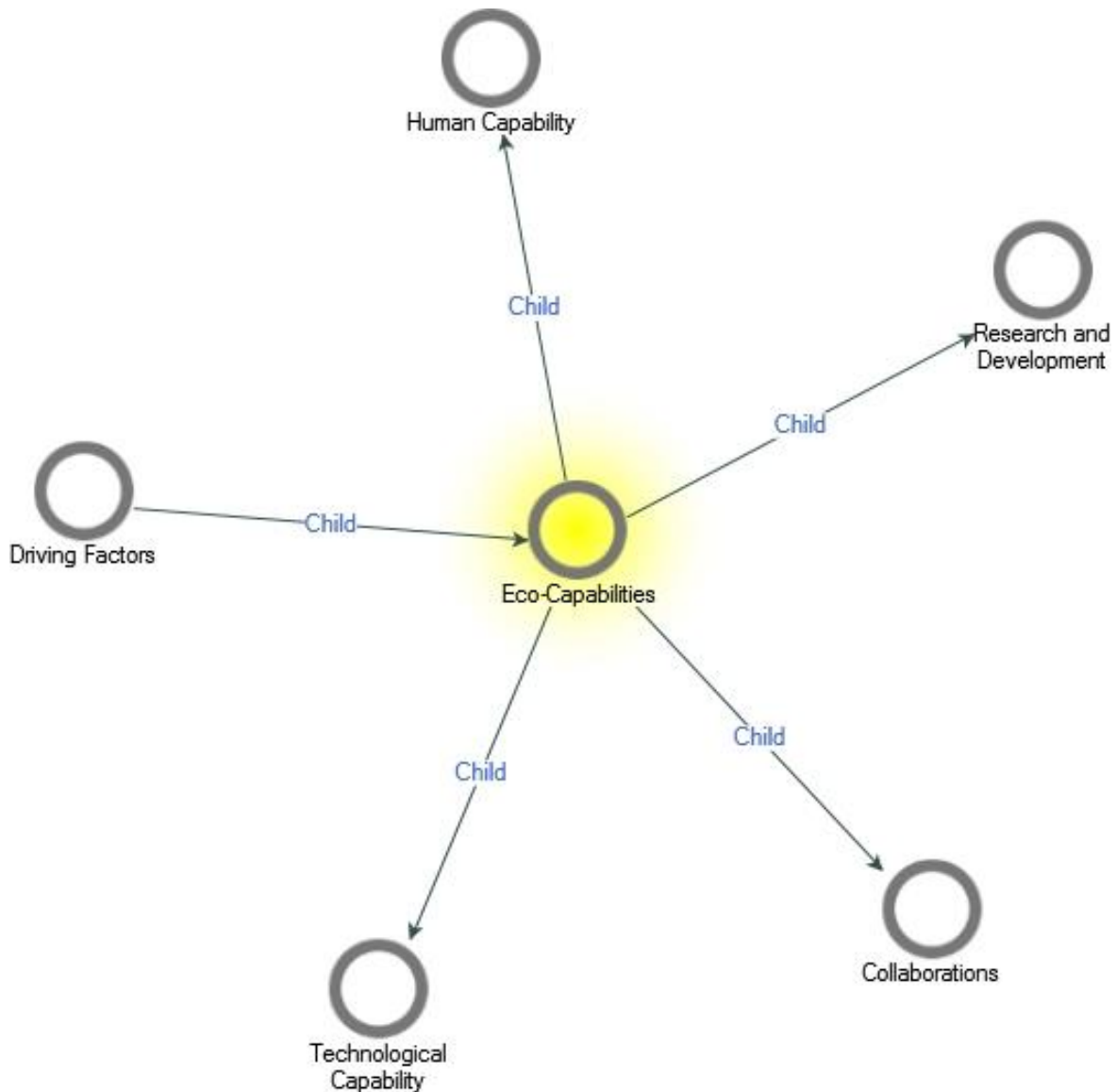
Based on the above-discussed findings the initial proposition is accepted. Managerial information regarding the expenses of new eco-packaging and its advantages in long run has a direct influence on the company’s decision regarding altering its packaging material by adopting eco-friendly packaging.

Proposition 2b: *Managerial environmental cost-benefit awareness can considerably encourage the adoption of eco-packaging innovation.*

7.6. Eco-Capabilities:

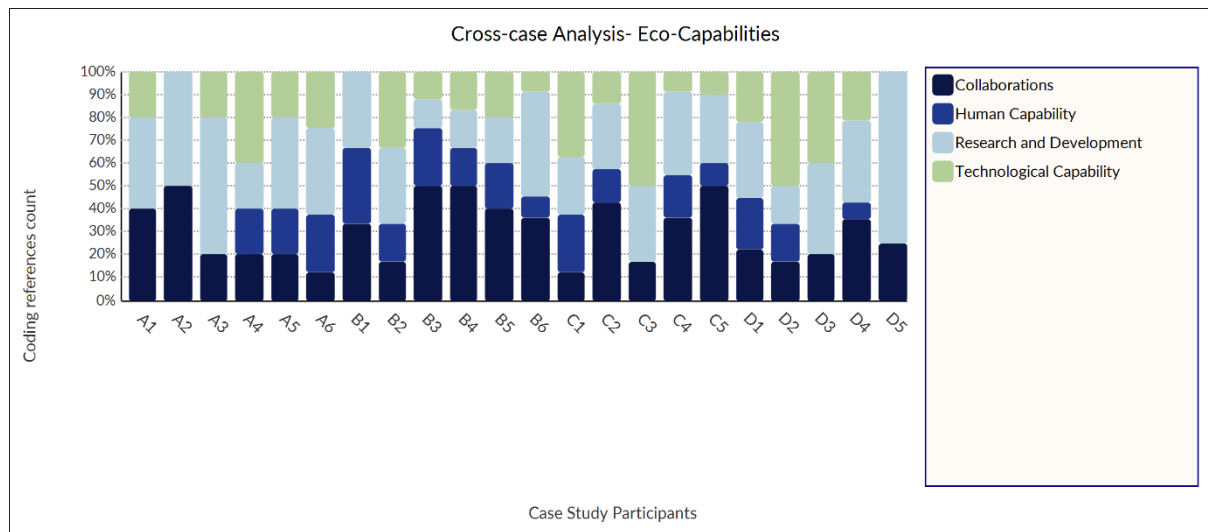
In this section, the researcher will explain the comparison of all four case studies concerning eco-capabilities. Most of the participants from all four cases from food and drink companies agree that eco-capabilities have a direct relationship with eco-packaging. After the analysis of interview data, three-second constructs emerged from the eco-capabilities. The following figure is showing the main theme as a parent node and sub-themes and child node from the NVivo software perspective. All Sub-themes will be further discussed in this section.

Figure 7.4: Explore Diagram showing Eco-capabilities (theme) and their Sub-themes relationship



The above figure is an explore diagram that is created by the researcher using NVivo software. It is explaining the main theme code with sub-themes as child codes. These codes are analysed to compare the views and experiences of all four case companies' employees. The coded content is analysed and further explained below in the same section as individual sub-theme categories. The following figure is comparing all four cases based on the response of their employees regarding the eco-capabilities of their companies that are important for eco-packaging.

Figure 7.5: Cross-case Analysis- Eco-capabilities



The above cross-case analysis diagram is evidence that is explaining the eco-capabilities as three sub-themes (already determined by the researcher based on existing literature) and a new emerging sub-theme as collaboration. A few participants did not reference the human capabilities, but they are countable in numbers across the four cases. When we analyse the comments of different participants on all four sub-themes separately, we understand their views based on their experience according to their company’s decision to introduce change in their packaging.

They discussed different things that their company consider before the actual adoption of eco-packaging including internal capabilities that they termed eco-innovation capabilities to introduce eco-packaging more effectively within the market. These different capabilities discussed in the interviews are explained separately below. It is also significant to note that the researcher chose to create distinct propositions for each sub-theme of eco-capabilities to contribute to the study by thoroughly elaborating on each one separately.

7.6.1. Technological Capabilities:

Technological capabilities are explained by most of the participants as tangible technology, knowledge regarding new eco-technology, and experience that a food and drink company needs for the adoption of new eco-packaging. It is critical to underline the fact that all cases agree that technological capabilities as a new eco-technology are essential to have for a better understanding and development of eco-packaging for their product.

According to the research participants, technological capability improves the company’s ability to develop a new eco-packaging with a better design that adds value to the brand. These new

eco-technologies are strongly pushing companies towards eco-innovation. Case A participant explained that his company is using new technology to incorporate new features in its packaging as new features of its packaging.

Participant A1: *“We are also working on new smart technology available in the market that will help us to reduce our food waste by increasing its shelf life and timely warning of food expiry so that we can have proper arrangements for the consumption or disposal of that food”*.

Participant C2: *“Technical changes are also necessary for the adoption of any new strategy or bring change in production operation. These changes are mostly related to the new technology for recycling operations and for using different materials. When we started working with paper packaging our company invest in new technology required for paper packaging”*.

Participant C4: *“Technical changes are often termed as technological innovation by linking it with eco-innovation. Such technological resources are sometimes prerequisites for eco-packaging adoption and in other cases, this new technology helps firms in energy saving, less water waste, fewer emissions, and less pollution to air and water. For example, when we are adopting eco-packaging materials, they have specific technology to use those materials”*.

The participants from cases C and D, also linked eco-technology to the eco-capability of the company to reduce waste. According to these participants, the new eco-technology is using fewer natural resources and contributing to fewer emissions and less waste. these participants linked eco-capability with eco-packaging and reduction in waste by saying that:

Participant C3: *“Introduction of eco-technology, eco-process, and eco-packaging is also linked with less use of energy, water, and other natural resources along with reusing recycled water and renewable energy for the production process. This new eco-technology also creates its internal demand by providing business benefits”*.

Participant D2: *“We have also adopted technological innovation that is helping us to improve our bottle shapes, and features, using more recycled material in bottles and decreasing CO2 emissions. This new technology is also helping us to reduce our food waste”*.

Participant D4: *“The new innovative technology allows firms to reduce their greenhouse emissions, energy and water use, and waste. Along with that research and knowledge, financial capability and employee management are essential for the implementation of eco-innovation decisions”*.

The first claim about technical capability is confirmed by the facts and may be interpreted as follows:

Proposition 3a: *Technological capabilities can facilitate the process of successful adoption of eco-packaging innovation.*

7.6.2. Human Capabilities:

All respondents from four cases agree that human capital is an essential requirement for eco-packaging as it is a significant component for a reduction in carbon emissions and the implementation of strategies for environmental regulations. The interviewees agree that more educated human capital within the company will be helpful to maintain technological innovation with less cost on technological implementation as eco-technology also required a green production process. The interviewees also highlighted those human capabilities in terms of employee training or hiring new employees specifically for eco-packaging is an essential requirement. The following quote is explaining the same fact:

Participant C1: *“Human capabilities can build by human development. Human development is not only the basic need of the company but also a participatory and dynamic process. These human resource capabilities empower a firm to create its core competencies to compete in the market. These human resource capabilities are the intellectual capital of the firm that cannot be seen in the balance sheet of the company but can help to attain sustainable competitive advantage”.*

Participant C2: *“Human capabilities come under the category of human resource management which is an internal capability of a firm. To build human capabilities mean hiring a new educated person who can handle new technology and can work efficiently with new eco-packaging materials”.*

Company A and B respondents agree that they provide their employees proper training to enhance their capabilities before proper implementation of their eco-packaging-related company’s strategy. According to the respondents:

Participant A6: *“We provide proper new knowledge and training before starting to work with new packaging for our products. Employees for given every information that they need to know”.*

Participant B6: “*Human capabilities is an investment on employees in form of their training, education, knowledge, and practical abilities*”.

The research participants also used the terms education, knowledge, training, health, and safety measures for human capabilities. They also added that employees are intangible assets of the company, any kind of investment in human capital means improvement in their productivity and by environmental regulations knowledge these employees are helping their companies to follow the environmental standards in form of packaging regulations (i.e. EPR for packaging, CSR and waste management policies). Two participants said that:

Participant D1: “*Human capabilities are an intangible asset for the company, and it is necessary to increase such assets as well with an increase in tangible assets. The human abilities can only be increased by increasing their education, knowledge, expertise, confidence, work efficiency, and work experience*”.

Participant D4: “*Human capabilities can be built by increasing human knowledge, increasing employee qualification, new training, and health and safety measures for the company workers. It also includes increasing employee incentives, pensions, and clarity of mind by answering every question in their mind related to change in packaging materials and technology*”.

It is clear from the above quotations that human capacities and the adoption of new technologies for eco-innovation and eco-packaging are inextricably intertwined. Therefore, the researcher can confirm the previous proposition developed in the earlier chapter that human capabilities enhancement is an essential requirement for the adoption of eco-packaging innovation for food and drink manufacturers.

Proposition 3b: *Human capabilities can facilitate the process of successful adoption of eco-packaging innovation.*

7.6.3. Research and Development Capabilities:

Findings from three cases except for case D, explain developing research and development capabilities is of utmost importance for eco-packaging. Research and development, according to study participants, is another reason why food and beverage firms invest in eco-packaging. The proliferation of various eco-innovation activities within the food and beverage industries is said to depend on the research and development efforts.

In terms of eco-packaging research and development capabilities refers to the company's ability to deal with different types of environmental materials available for packaging within the market. One of the participants from case A linked research and development with collaboration as companies may get benefit from the other companies and research institution services for solving their confusion and queries regarding which type of packaging will be suitable for food and drink products. The following quotation will help to understand this beneficial impact of research and development skills on the adoption of eco-packaging:

Participant A5: *“We are doing research and gathering information on different eco-friendly materials available in the market and different eco-packaging that is existed in the market to get a perfect substitute for our old packaging. Research and development resources consist of od different knowledge materials that we can attain from the collaboration with academic and research organisations about different materials for eco-packaging and how many new eco-packaging are available around the world. this research helps us at knowledge distribution and training stage along with buying less costly material from any other part of the world”.*

Participant D1: *“Research can be done through partners' help, by collaborating with academic researchers, and government policy knowledge”.*

Another thing discussed by the interviewees is that the hygiene factor involved with food and drink products also requires companies to do research before using any recycled, reused, and renewed material as eco-material for their packaging.

Participant B1: *“Research should be conducted through valuable and authentic resources that include scientific laboratories for packaging hygiene purposes and institutes who have case study-based knowledge about that eco-packaging, or they have enough data about how this packaging came into existence and which other company is using this packaging and what is the specific brand category of that company?”*

Research is also helping food and drink companies with the evaluation of eco-materials and their costs. One of the aspects discussed by the employees is that the cost of recycled materials is less in some countries as compared to others. Additionally, some countries around the world are in the very initial stage of their packaging waste management policies. International recognition and competitive advantage can be gained in those countries if we have our own environmental (eco) packaging research and development investment.

Participant B6: *“We are testing different materials as eco-packaging and collecting the data of our experiments to improve these materials according to our product needs. This way we are*

learning more and more about different sustainable packaging materials for zero waste economy”

Participant C2: *“We have our research and development network that is developing high-performance papers with a barrier to fight with fire and water, biodegradable, or compostable packaging materials, refillable and renewable packaging”*

The firm's waste management strategy is related to this research and development as well. As the interviewee explained that their company invested in research on eco-packaging that will reduce packaging waste.

Participant C5: *“Our company has established an institute of packaging science in 2019 for research and development on sustainable packaging for healthier, safe, and operational packaging to address worldwide packaging waste challenges”*.

Participant D5: *“Research and development for packaging designs that can decrease waste by using less raw materials and less natural resources. Research for new packaging innovations in form of better alternatives of plastic that have recyclability and biodegradability features. Adoption of new technological innovation makes a firm capable of improving its environmental performance by fewer air emissions, less water and energy use, and less waste in form of landfills”*.

Considering the rationale of this research, we may suggest that research and development serve as a mechanism for food and drink manufacturing companies to embrace eco-packaging innovation for waste management.

Proposition 3c: *Research and Development capabilities can facilitate the process of successful adoption of eco-packaging innovation.*

7.6.4. Collaboration:

Collaboration is explained by the different respondents as cooperation with different other companies to improve in the internal capabilities of the firm. The participants directly mentioned that collaboration smoothest the way for the company to adopt eco-innovation by conveying proper trustworthy information. Collaboration also helps the company during its research and development process as if the firm is doing this process alone it will be much more complicated to execute the plan for the adoption of eco-packaging.

Participant A4: *“Our company has a partnership with different other companies to provide the raw material for packaging from environmentally responsible resources. We are in collaboration with research institutions and universities to keep us fully up to date about the knowledge and information of new eco-packaging and the materials that are easily and with less cost available for eco-packaging”.*

Participant A5: *“We have collaborations with universities, research organisations, and packaging producers to have up-to-date knowledge of new eco materials for packaging. This collaboration is necessary as we did not have enough knowledge and information about the eco-packaging materials available all over the world. Partnership with international packaging firms helps us to have less costly packaging materials that we can import from developing countries. The knowledge available from academics and research institutions also helps us to understand different alternatives of plastic that we can use as eco materials of our packaging”.*

In the above statements, participants mentioned partnerships for the research and development of eco-materials for eco-packaging from research institutions, research companies, and academic researchers. These partners are considered as a source of valid information for the company for the eco-packaging adoption decision.

The interviewees also mentioned that there are specific environmental management companies that are available to collaborate with food and drink companies for their environmental audits to evaluate the use of energy, water, natural resources, emissions, recycling, and waste. These environmental management companies are very helpful if they provide proper measures to improve any process that is causing an environmental problem. In the case of eco-packaging, these companies are providing proper data on how much change is needed for the company to categorise its packaging to be eco-friendly packaging. The following quotes are explaining the same:

Participant B3: *“We have collaboration with environmental management companies for regular audits of our production sites so that we can have an exact idea that how much change is required and how much we have already done from our side. Our partner company regularly evaluates our packaging and packaging production system and provides the data regarding emissions, water, waste, energy, and disposal information to us and provides suggestions that we can use to improve packaging. Additionally, we have collaboration links in research institutions that also provide us the useable information about new inventions and innovations*

in packaging materials based on product characteristics. For example, which kind of eco-packaging is best for our food items based on the required temperature to improve their shelf life”.

Participant B4: *“We have made direct financing and alliances with the specific EPR for packaging scheme holding companies for the collection of our packaging waste. We are also planning to introduce refillable and reusable bottles to tackle the waste that is the root cause of environmental problems”.*

Participant C2: *“We also have partnerships with many companies who have eco-packaging start-ups, famous academic and research institutes, and green packaging suppliers. These research and development partners will give us valuable knowledge about many types of innovations including packaging that will help us to comply with all requirements of ISO standards”.*

Some respondents explained that their company has collaborated with waste collection companies for the collection and recycling of their packaging waste. This kind of collaboration is helping the company to reduce its waste and get recycled materials as raw materials for their new packaging. As explained below:

Participant C2: *“We are collaborating with the companies who can collect and recycle our packaging waste for us”.*

Partnership C3: *“Our company has both environmental certification and partnerships. A partnership is needed because we did not have our recycling system in many countries around the world including the UK. These partners help us by collecting our food and drink packaging waste on our behalf and converting it to raw material for us and other sectors”.*

Participant C5: *“We have also signed partnership contracts with the industry and public-based organisations to have complete knowledge about different biodegradable packaging products for plastic and waste-free future. Some of our partners are also helping us with the collection, recycling, and renewal of our packaging waste”.*

Participant D4: *“Collaboration with recycling companies is helping us to get recycled materials and find new suppliers for recyclable materials. We are using non-food biodegradable, compostable, plant-based plastic as recyclable plastic for our packaging. We are collaborating with the company who invented the world’s first recyclable paper bottle”.*

The above-mentioned quotes are explaining the importance of collaboration for the effective

implementation of eco-packaging by the food and drink companies. Based on the above statements by the respondents of food and drink companies, the researcher suggested that there is a new emerging proposition explained below:

Proposition 3d: *Organisational Collaboration via appropriate partnership positively influence the eco-packaging adoption for food and drink companies.*

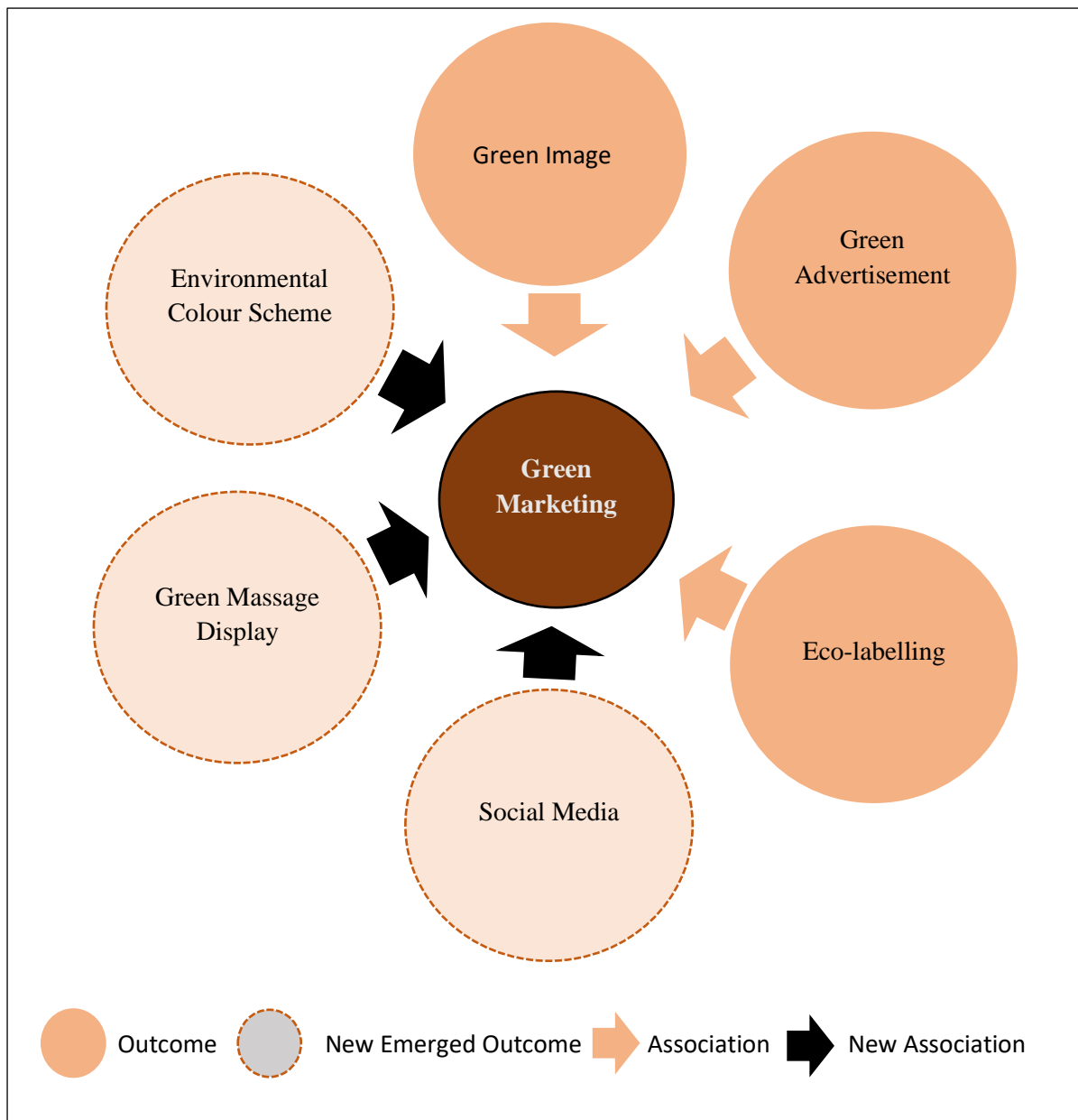
7.7. Impact of Eco-packaging Adoption:

There are several outcomes explained by the respondents from four cases after the successful implementation of eco-packaging innovation by food and drink manufacturing companies. These are green marketing initiatives in terms of green promotions and waste prevention. There are newly emerged themes in green marketing that are explained in the following section.

7.7.1. Green marketing:

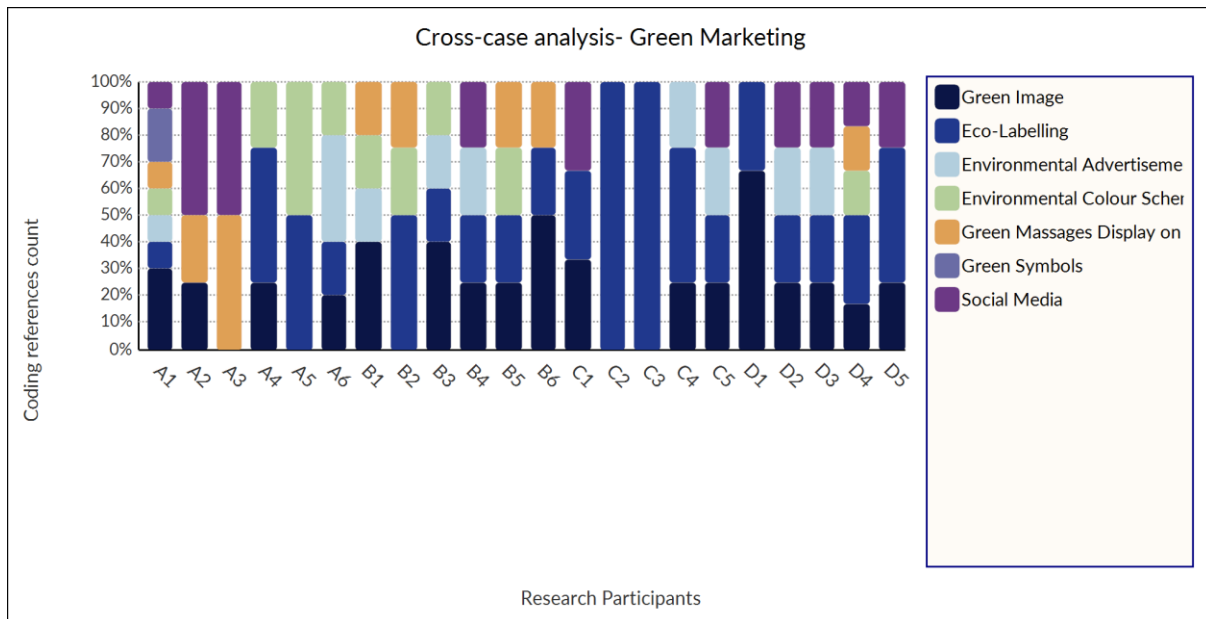
As a result of eco-packaging adoption, various brands start changing their positioning strategy by representing it through “green” colour or environmental symbols. By implementing green marketing strategy companies are also changing their promotional strategies to fulfil environmental regulations and green consumers' requirements. The next part will describe the effect of eco-packaging on the green marketing strategies used by food and beverage firms (covering both the old and new results for green marketing). Figure 7.6 below is explaining all old and new emerging outcomes for food and drink companies' green marketing strategies after eco-packaging adoption. The new outcomes are shown in dashed lines around the circle and dark colour arrows.

Figure 7.6: Green Marketing as main theme along with Sub-themes and newly emerged themes



The coded content analysis for the impact of eco-packaging adoption on the food and drink companies green marketing strategy and its sub-themes across all four cases is shown via NVivo matrix coding query image 7.7 below for sections 7.7.1.1, 7.7.1.2, and 7.7.1.3.

Figure 7.7: Cross-case Analysis- Green Marketing



7.7.1.1. Eco-labelling:

The first outcome because of eco-packaging adoption by food and drink companies in terms of green marketing positive green message and consumer awareness regarding packaging is through eco-labelling. Because their businesses were successful in introducing eco-packaging, the participants from all four examples concur that eco-labelling is an outcome determinant. It has not been as much discussed in the case of D as compared to the other three cases as they are in the very early years of eco-packaging innovation adoption for their food commodities.

The conclusions drawn from the empirical data support the prior hypothesis that eco-innovation, green marketing, and eco-labelling are related. The interviewees agree on the fact that green strategy, green marketing, environmental advertisement, and eco-labelling are used as successful strategies around the world by the food and drink companies to create awareness, loyalty, and trust among consumers. They admitted the fact that their products have been eco-labelled for creating awareness among consumers for reusability, recyclability, less waste of resources, and fewer landfills. The following quotes are explaining this fact by the interviewees:

Participant C5: *“Our packaging has eco-labelling, emissions, and recycling information written on it so that consumers can understand our efforts. Proper disposal information of packaging waste is also mentioned on the packaging for throwing it in the relevant bins”*

Participant D3: *“Our eco-labelling is also educating consumers to reuse our packaging and proper disposal in the recycling bins so that our recyclable packaging will not become a part of landfills”.*

Based on the above-mentioned justifications, the researcher proposes the following proposition:

Proposition 4a: *The impact of eco-packaging innovation on green image is likely to be enhanced, by using eco-libelling as green marketing tool.*

7.7.1.2. Environmental Advertisement:

Another green marketing strategy used by the case companies is an environmental advertisement to communicate their environmental strategy and eco-innovation efforts to the consumers. In this study environmental advertisement theme is used to explore the means that the companies are using to communicate their green strategies and environmental contributions. The participant agreed that they are changing their advertisements to promote their eco-packaging.

Participant A6: *“We are working on our eco-packaging promotions by gradual changes in our advertisement”*

Participant B1: *“We are spreading awareness throw our advertisement for a small number of, recycled or no plastic products and finishing throwaway traditions from every economy where we are selling our brands”.*

Participant B3: *“We have an environmental advertisement that shows our environmental commitments and efforts”.*

The participant agreed for using different social media channels to communicate their environmental initiative in terms of eco-packaging.

Participant D2: *“We are using all media of communication to convey our massage and efforts to the consumers including TV”.*

The following proposition is accepted and posited considering the analysis of the above-mentioned empirical data:

Proposition 4c: *The impact of eco-packaging innovation on green image is likely to be enhanced, by using environmental advertisement as green marketing tool.*

7.7.1.3. Environmental Colour Scheme:

A new outcome identified during data analysis is the environmental colour scheme. According to the company employees their companies are using environmental colour schemes in their packaging to attract green consumers to their products. For instance, green colour has a direct relationship with plants and green colour packaging will have a direct impact on the mind that this packaging is linked to nature. But it can only be a tactic to attract buyers therefore it can explain green washing by the company. The interviewees from cases A, B and D admit that his company is using a green colour scheme as a part of its green marketing strategy to attract buyers. Below is the key quote to explain this:

Participant A4: *“We have advertisements via colours and symbols that click the buyer's mind that the packaging used by our company is eco-friendly packaging”.*

Participant B2: *“Our product packaging is using a green environmental colour scheme as a marketing strategy of the company”.*

Following the discussion above, the researcher is putting up the following idea:

Proposition 4d: *The impact of eco-packaging innovation on green image is likely to be enhanced, by using environmental colour scheme as green marketing tool.*

7.7.1.4. Green Message Display

Another green marketing strategic tool after adopting eco-packaging is a green message display on new eco-packaging. Case A, B, and D strongly agree on the fact that they are using green messages as marketing communications as a more favourable source to convey their message of being a responsible producer. Interviewees explain that these messages explain the consumers' personal and environmental benefits that they can attain from this new packaging. These green marketing communication messages are attracting green buyers. These messages also contain eco-packaging recycling, reusability, and renewability information along with the knowledge of proper disposal of this eco-packaging. The following quote is explaining this argument.

Participant B5: *“We have complete information on the packaging of our products that they should not be thrown out with regular waste instead of buyers need to throw it in recycling waste bins”.*

Participant B6: *“Our packaging is also educating consumers by giving them recycling information and introducing the ways to reuse packaging”*.

The following novel idea was developed following an empirical study of interview data gathered by participants from all four case companies:

Proposition 4e: *The impact of eco-packaging innovation on green image is likely to be enhanced, by using green message display as green marketing tool.*

7.7.1.5. Social Media

Another outcome of eco-packaging adoption in terms of green marketing is social media communication. A few respondents from cases A, B, C, and D explain that most people are also influenced by social media messages and use them to get and share information regarding the environmental strategies of the companies. Therefore, their food and drink companies are also very active on social media to respond to every query and question raised by the consumers. The social media messages communicated by companies have a direct impact on consumer behaviour.

Social media is also providing a huge amount of up-to-date information on plastic packaging problems, packaging waste, new eco-designs for packaging, eco-materials availability, and consumers' response to the eco-packaging available in the market. All this knowledge is helping companies to effectively implement their eco-innovation strategy in terms of packaging. Additionally, food and drink companies are using social media to educate consumers regarding eco-packaging features especially proper recyclability and disposal for less waste. Below are the arguments made by the respondents regarding using social media to educate and inform consumers about their eco-packaging.

Participant A3:” *using social media platform, we are encouraging customers to reuse packaging via different ways and try to dispose of it in the exact way how it should be”*.

Participant B4: *“We are using different social media platforms to share knowledge about our company’s efforts for the environment in form of improved eco-packaging”*.

Participant D5: *“We are answering public questions regarding our production process, recycling, waste, and environmental policies on our social media platforms”*.

Based on the above discussion regarding social media as a green marketing communication tool after eco-packaging adoption, the following new proposition is developed:

Proposition 5: *The impact of eco-packaging innovation on green image is likely to be enhanced, by using social media marketing as green marketing tool.*

7.8 Green image

The second outcome of eco-packaging in terms of green marketing is a green company image. This has been achieved by the companies after targeting green consumers and using eco-labels as their marketing strategy to increase eco-packaging awareness among stakeholders and green buyers. The empirical data findings reveal that environmental policy is used as a driving force by the companies for eco-packaging. The company uses green marketing as a technique to promote its environmental initiatives through eco-labelling and eco-advertising in order to enhance its reputation as a green business.

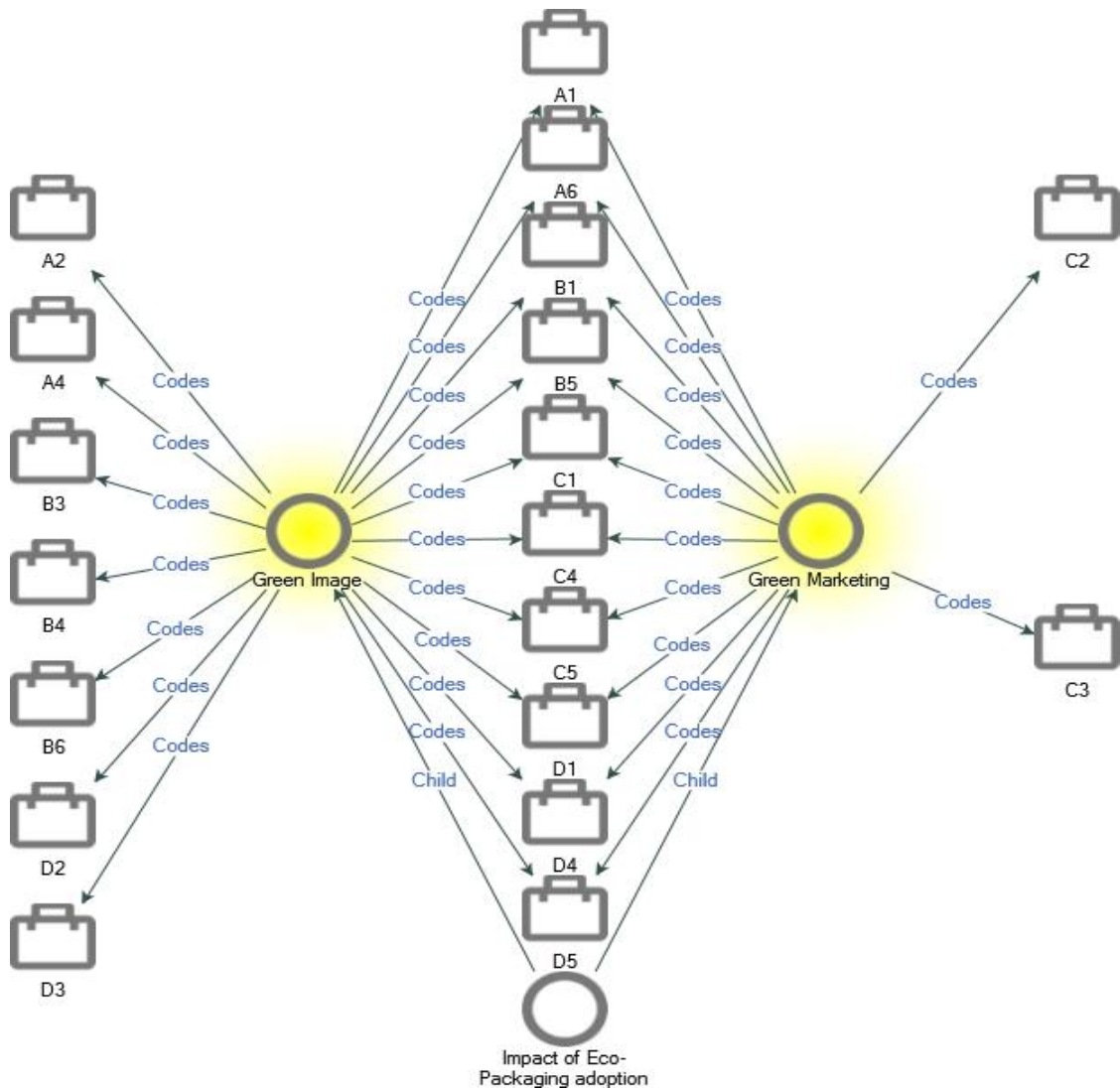
After analysing the interviews of all interviewees across the four case companies it has been found that it is possible to find a link between eco-packaging and green image. The green image is attained by showcasing the eco-innovation in packaging by using it as a marketing tool for improvement in company's reputation. The following figure is also explaining that there is a possible impact of eco-packaging adoption in terms of green marketing and green image. The following quote by one participant from company B is explaining his company's experience after eco-packaging adoption.

Participant B1: *“Our company image has been improved in the market and its survival has become easy after eco-packaging adoption”*.

There were also research participants that explain the path of how the adoption of eco-packaging is linked to a green image. These participants find that the eco-packaging company has less waste and uses its natural resources efficiently. As a result of these changes the company has improved its image in the market.

Participant D1: *“Eco-packaging and eco-technology help to decrease emissions and in efficient use of natural resources like water and energy, that resultantly improve company image”*.

Figure 7.8: Comparison Diagram of the impact of eco-packaging innovation adoption on Green Marketing and Green Image



The participant from case D is also showing positive views for attaining a green image after knowing the experience of other companies who already introduced eco-packaging. On the other hand, participants' C2 and C3 interviews are not capturing green images.

Based on the above discussion, as most of the participants express a positive opinion regarding eco-packaging that it can help the company to enhance its green image, proposition 4b is supported and stated as follows.

Proposition 5: *Eco-packaging innovation can help food and drink companies to gain green image.*

7.9 Waste Prevention:

The most beneficial outcome of eco-packaging adoption for food and drink companies is waste prevention/reduction. Eco-packaging is directly contributing to the decrease in packaging waste because of its recyclability and other environmental features. The interviewees admit the fact that after investing in eco-packaging they have decreased they're during production and packaging waste. These food and drink companies' employees discussed that their companies are focusing on minimising the packaging to reduce waste and using recycled packaging raw materials that can be reused and recycled by the consumers. For instance, this quote is explaining the same:

Participant D3: *"We are using reusable packaging for our food products and customers are using them again for storage purposes in a home that is decreasing waste"*.

The case company employees also highlighted their efforts and strategies to reduce virgin plastic so that they can solve the problem of end-of-life waste streams. The following quote is explaining this:

Participant B5: *"By proper implementation of these packaging and waste-related strategies we have decreased 98% waste per ton in last 15 years"*.

Most of the research participants agree on the fact that their companies are introducing eco-packaging with features such as recyclable, renewable, and reusable. Bellow's key quote from the interview findings is explaining this:

Participant C2: *"We are decreasing our waste by decreasing packaging materials and replacing plastic with recycled materials that are easy to handle and recycle. Renewable and renewable features are also helping us and others to reuse packaging without spending too much cost on it"*.

Another approach to reducing packaging waste is to decrease the packaging material. The same is explained by one of the respondents:

Participant C3: *“The big benefit is a reduction in production waste as we have reduced the packaging volume therefore there is less waste”*.

Company B employees identified that their company has introduced post-consumer recycled plastic. This recycled plastic is retrieved from the packaging waste collected by the company from the consumers. Case B interviewee explains that:

Participant B4: *“Currently we are recycling 10% of our post-consumer packaging waste every year but we are aiming to increase this recycling process up to 25% in 2025”*.

Participant B5: *“We are using post-consumer recycled (PCR) plastic for our packaging”*.

The Case D participant also identifies post-consumer renewable materials as a waste reduction goal for his business.

Participant D2: *“We are committed to using post-consumer plastic waste as raw material for our drink packaging in 2022”*.

The existing proposition is confirmed and is now put out as follows considering the debate above:

Proposition 6: *Eco-Packaging innovation is helping food and drink companies in waste prevention process.*

7.8. Updated Propositions and Cross-Case ordered effect Matrix:

After analysing the cross-case interview data the existing propositions proposed in chapter 4 have been checked against the cross-case findings. These propositions are accepted after the discussion of the data collected by the respondents. The emerging propositions are also cross-checked in the cross-case analysis chapter and based on the findings new emerging propositions are proposed. The undeniable arguments given by the interviewees are used to explain these new propositions before adding them to the list of research propositions. The research framework was then updated by adding new driving factors of eco-packaging introduced by the respondents. The following table is explaining the existing and new propositions that belong to this research.

Table 7.3: Cross-Case Propositions

Proposition Number	Existing Propositions (from Chapter Four)	Revised Propositions
P1a.	Competitive pressure is associated with the adoption of eco-packaging innovation.	
P1b.	Customer demand can influence the adoption of eco-packaging innovation.	
P1c.	Environmental Regulations have a significant influence on the adoption of eco-packaging innovation.	
		Emerging Propositions
P1d		Stakeholders' views and opinions to introduce environmental packaging can influence the adoption of eco-packaging innovation.
P2a.	Managerial environmental risk awareness can significantly influence the adoption of eco-packaging innovation.	
P2b.	Managerial environmental cost-benefit awareness can significantly influence the adoption of eco-packaging innovation.	

P3a.	Technological capabilities can facilitate the process of successful adoption of eco-packaging innovation.	Technological capabilities such as new technical equipment, IT system, and innervational changes in company operations can facilitate the successful adoption of eco-packaging innovation.
P3b.	Human capabilities can facilitate the process of successful adoption of eco-packaging innovation.	Human capabilities such as employee training, employee knowledge via workshops, and seminars, and employee health and safety are significant to achieving the successful adoption of eco-packaging.
P3c.	Research and Development capabilities can facilitate the process of successful adoption of eco-packaging innovation.	
		Emerging Propositions
P3d.		Organisational Collaboration via appropriate partnership can facilitate the process of successful adoption of eco-packaging innovation.
P4a.	The impact of eco-packaging innovation on the green image is likely to be enhanced, by using eco-labelling as a green marketing tool.	
P4b.	The impact of eco-packaging innovation on the green image is likely to be enhanced, by using environmental advertisement as a green marketing tool.	
		Emerging Propositions
P4c.		The impact of eco-packaging innovation on the green image is likely to be enhanced, by using an environmental colour scheme as a green marketing tool.
P4d.		The impact of eco-packaging innovation on the green image is likely to be enhanced, by using green message display as a green marketing tool.

P4e.		The impact of eco-packaging innovation on the green image is likely to be enhanced, by using social media marketing.
P5.	Eco-packaging innovation can help food and drink companies to gain a green image.	
P6.	Eco-Packaging innovation.is helping food and drink companies in the waste prevention process.	

The propositions based on the driving factors and effect of eco-packaging adoption are represented in form of a case-order effect matrix. According to Miles and Huberman, (1994) case-order effect matrix can be used to present the important driving factors and the outcome in form of the impact of those driving factors. It also helps the researchers to represent evidence to replicate theoretical propositions and generalise study findings (Yin, 2014).

The adoption of eco-packaging by food and drink firms, as well as its connections to waste reduction and green marketing, have been studied using the four cases (A, B, C, and D). From the empirical evidence collected from the interview data, there is a positive impact on most of the driving factors for eco-packaging adoption and the link between eco-packaging, green marketing, and waste prevention. The bellow table 7.4 will help to develop a new theoretical model to explain the eco-packaging adoption drivers and their outcome in form of green marketing and waste prevention.

Table 7.4: Case-Order effect matrix

Proposition	Theoretical Association	Case A	Case B	Case C	Case D
P1a	Competitive Pressure - Eco-packaging Innovation	✓✓	✓✓	✓✓	✓✓
P1b	Customer's Demand - Eco-packaging Innovation	✓✓	✓✓	✓	✓✓
P1c	Environmental Regulations - Eco-packaging Innovation	✓✓	✓✓	✓✓	✓
P1d	Stakeholders' views - Eco-packaging Innovation	x	✓✓	✓	✓

P2a	Managerial Environmental Risk Awareness - Eco-packaging Innovation	✓✓	✓✓	✓	✓x
P2b	Managerial Environmental Cost Awareness - Eco-packaging Innovation	✓✓	✓✓	✓	✓
P3a	Technological Capabilities - Eco- packaging Innovation	✓✓	✓✓	✓✓	✓✓
P3b	Human Capabilities - Eco-packaging Innovation	✓✓	✓	✓	✓✓
P3c	Research and Development Capabilities - Eco-packaging Innovation	✓✓	✓✓	✓✓	✓✓
P3d	Organisational Collaboration - Eco- packaging Innovation	✓	✓✓	✓	✓
P4a	Eco-packaging Innovation - Eco-Labeling	✓✓	✓✓	✓✓	✓✓
P4b	Eco-packaging Innovation - Environmental Advertisement	✓✓	✓✓	✓✓	✓✓
P4c	Eco-packaging Innovation- Environmental Colour Scheme	✓	✓✓	*	**
P4d	Eco-packaging Innovation – Social Media Marketing	✓✓	✓*	✓	✓
P4e	Eco-packaging Innovation –Green Message Display	✓✓	✓✓	✓✓	✓✓
P5	Eco-packaging Innovation - Green Image	✓✓	✓	✓✓	✓✓
P6	Eco-packaging Innovation –Waste Prevention	✓✓	✓✓	✓✓	✓✓

7.9 Revised Framework Eco-Packaging adoption for Waste Prevention

The motives for adopting eco-packaging innovation and the outcomes of this adoption in terms of the business's green marketing strategy and waste avoidance are explained by the suggested theoretical framework presented in third chapter. A new theoretical framework is built by integrating previously proposed and newly developing themes after a cross-case study of the data gathered by the employees of the food and drink companies revealed some new themes. It is explaining external drivers (Cai and Zhou, 2014), managerial (Gedenne et. al., 2009; Peng

& Liu, 2016), and internal drivers (Jabar et. al., 2014; Gabler et. al., 2015; Souza et. al., 2017) advocating the adoption of eco-packaging innovation and its link to waste reduction and green marketing.

This study created a framework for the adoption of eco-packaging innovations by the food manufacturing companies (four instances) for waste prevention. It is explained earlier in chapter two that previous research is unable to explain eco-packaging adoption for waste prevention as most of the research focused on eco-innovation in general and consumer shopping habits and the introduction of eco-packaging innovation. This research examines the driving factors for eco-packaging adoption and its benefit in terms of green marketing and waste prevention.

In this study external and internal driving factors of eco-packaging specifically for food and drink companies are identified. The employee's response to these drivers and the impact of eco-packaging is explained in terms of their company experience. The companies selected for this research have already adopted eco-packaging and the interviewees are working in these companies for at least five years, so they gave plenty of knowledge of their company's experience with eco-packaging.

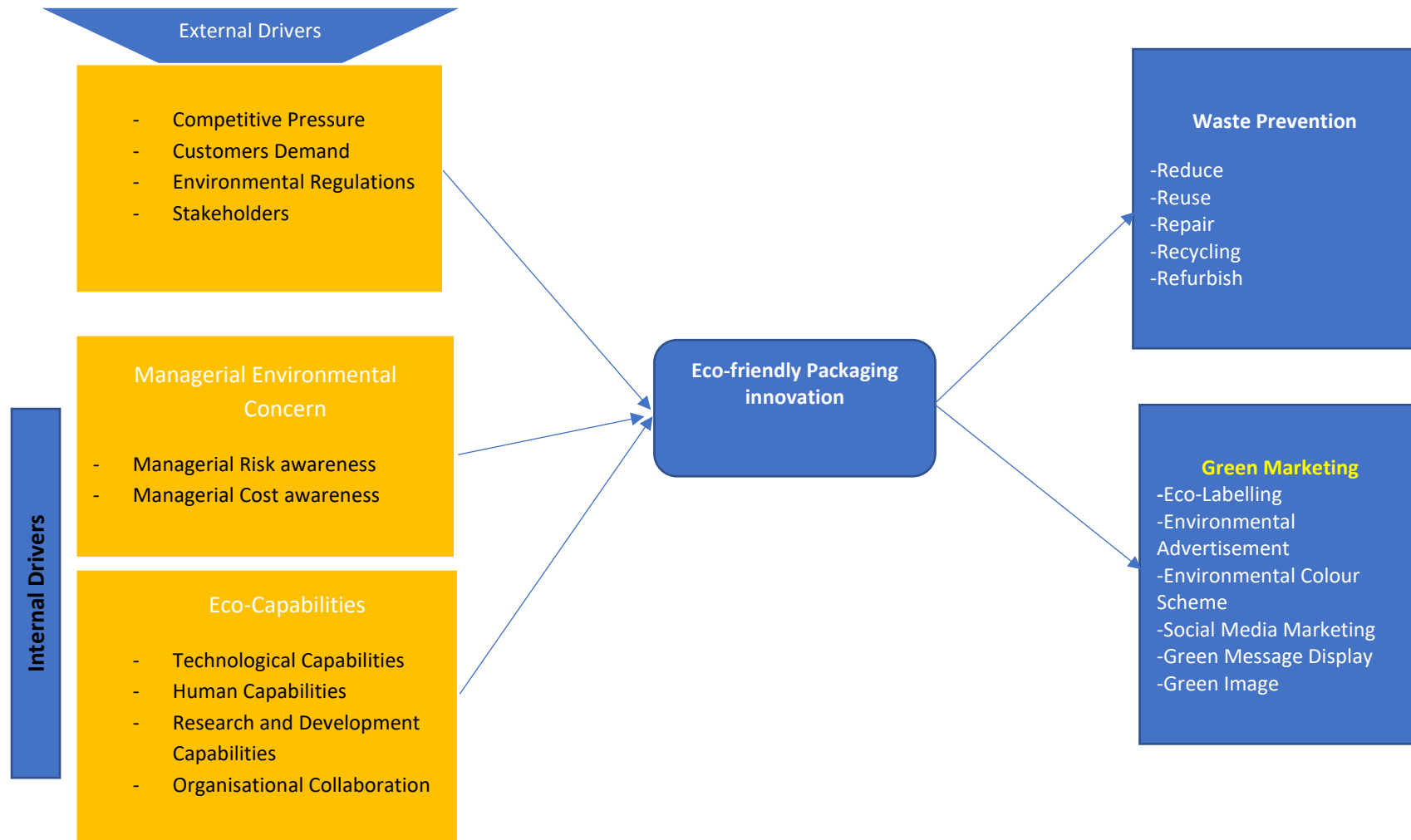
The study of the empirical data and discussion of the interviewee's comments in prior chapters served as the foundation for the framework that is presented below. The primary internal and external driving forces are crucial for the introduction of eco-packaging by food and drink firms. If we compare the previous theoretical model with the new revised theoretical model, we can see that the new emerging sub-themes are also incorporated into the new framework based on the four-case analysis. The new emerging theme for external drivers is stakeholders' pressure and for eco-capabilities, it is organisational collaboration. these new second-order themes are accepted as important driving factors by most of the interviewees. Similarly, it has also come to the knowledge that eco-packaging is linked to social media and green messages displayed on packaging as a green marketing strategy.

However, there are mixed views about the managerial environmental concern linked to eco-packaging adoption. Case A, B, and C mentioned it strongly, but case D did not mention managerial environmental concern as an important driver for eco-packaging adoption. These findings have insight for further investigation and discussion on eco-packaging for food and drink companies. As it has been mentioned in earlier chapters that barriers for the adoption of eco-packaging are not discussed in this research, it was decided that this issue can be discussed in future research by including waste management policies in the study. In cases, A and B

employees showed more knowledge as compared to cases C and D because the investment in eco-innovation is much more in companies A and B.

The researcher has changed the theoretical framework after providing all the above-mentioned explanations and based on the examination of empirical data. This new theoretical framework is establishing the relationship between four major external driving factors, managerial environmental concern, and four internal eco-capabilities and eco-packaging adoption. Similarly, this study evident the major link between eco-packaging and waste prevention. As eco-packaging features are promoting less use and waste of natural resources. This new revised framework is contributing to the uniqueness of this research along with enhancing the existing knowledge available on eco-packaging and eco-modernisation theory

Figure 7.9: Revised Theoretical Framework on eco-packaging adoption for waste prevention (created by the author from primary data)



7.10. Conclusion:

This chapter was based on the discussion regarding the views and experience of employees from four cases A, B, C, and D regarding eco-packaging adoption and explain the outcome of eco-packaging in terms of green marketing and waste prevention. The propositions that were proposed in earlier chapter 4 were analysed in with-in-case and cross-case analysis. After the analysis, there are some new propositions are emerged that were used to revise the existed theoretical framework.

One new theme that emerged in terms of external driving factors is stakeholders' pressure on the food and drink companies to rethink their packaging. Another important theme that emerged in the eco-capabilities of the firm is organisational collaboration which helps the company to share information regarding eco-packaging for food and drink products. The effect of this eco-packaging adoption was also examined in terms of changes that the company observed after the adoption of eco-packaging. The interviewees agree on the strong relationship between eco-packaging and waste reduction for their company. They also identified the changes in their marketing strategy as they have started using green marketing tools (eco-labelling, green message display) to communicate their green policies to the consumers for a green company image.

The association between eco-packaging and waste prevention was strong in case of cases A, B, and C but in case of D this association is not as much strength as in other cases. We can now state that the primary motivating drivers for the adoption of eco-packaging innovation by food and beverage firms are four external, two managerial, and four different types of eco-capabilities. The limits of this study, management repercussions, and areas of eco-packaging innovation that require more investigation will all be covered in greater detail in the following chapter along with a more detailed explanation of the findings.

CHAPTER 8

CONCLUSION, CONTRIBUTION, AND FUTURE RESEARCH

An overview of the research summary will be given in this chapter. It will also explain research objectives and research questions along with their answers obtained after empirical data analysis. The theoretical contribution to the research and its management implications will next be examined. The contribution made to the research's theory, procedures, and resources will also be covered in this chapter. At the conclusion of this chapter, suggestions and proposals for more study will be discussed. The main finding of this study is that the framework explains stakeholders, eco-capabilities, and consequences in terms of waste reduction within food and drink sector. This framework can help brand owners to understand important capabilities needed to get sustainability initiative by waste management (less waste) via zero plastic packaging.

8.1 Conclusion

This research contributes in the literature by identifying reduction in waste is a phenomenon that depends on change in the previous non-recyclable plastic packaging that has not been studied adequately in this body of knowledge. This research is based on stakeholders' theory, ecological modernisation, and circular economy characteristics (for eco-friendly packaging) to understand the process of the adoption of eco-friendly packaging.

Research is focusing on reduction in packaging waste for environmental protection. As food and drink companies has been emerged as big contributor to the packaging waste and most of their packaging is plastic packaging that is also very difficult to recycle therefore, this research is focusing on the reduction of non-recyclable plastic packaging by replacing it with eco-friendly packaging. Initial literature review search indicates that eco-packaging innovation is an emerging research area where its connection with waste prevention is still not established properly. The relationship between eco-friendly packaging and waste prevention was the actual knowledge gap in the existing literature. Due to the limited research time researcher cannot take all industries into consideration therefore, this research is only focusing on food and drink sector.

This research begins with the exploration of eco-friendly packaging as a contributor to sustainability and a source to decrease the use of plastic packaging in the food and drink sector. At first stage research investigate the important stakeholders that can help in the reduction of plastic by encourage the adoption of eco- friendly packaging. This also helps to understand the process and environment for the adoption of eco- friendly packaging. An exploration of existing literature helps to understand the most important driving factors for the adoption of eco-innovation.

These research findings give thorough literature support for eco-packaging innovation, which helps in providing answers to the research questions and attaining the research objectives. This qualitative research explains the primary factors influencing the adoption of eco-packaging innovation and the effects that adoption in terms of waste prevention for food and drink companies. The eco-packaging adoption process involves many considerations before deciding to change the existing plastic or non-recyclable packaging to new environment-friendly packaging or introducing eco-innovation features in the existing packaging (via changing in materials).

8.2. Answers to Research Questions and Research Objectives

Based on the knowledge, experience, and information provided by employees of food and beverage firms on their adoption of eco-packaging, the empirical findings will be reviewed in this part. The following is the foundation for the study's conclusions:

- To evaluate the content of prior studies different driving factors of eco-packaging innovation in the context of packaging waste prevention.
- To investigate managerial environmental concern as main driving factors of eco-packaging for packaging waste prevention in the UK.
- To understand how firm's eco-capabilities contributes to the adoption of eco-packaging for waste prevention by food and drink companies in the UK.
- To evaluate the impact of eco-packaging in terms of waste prevention specifically for food and drink companies in the UK.

This research used circular economy and ecological modernisation idea of innovation and its adoption and based on his definition respondents give the answers to the questions of what, how, and why they adopt eco-packaging to comprehend how important eco-packaging is to the

food and drink businesses. These first objective's findings may be summed up as two primary points:

1. Food and drink firms embraced eco-packaging innovation as part of their corporate environmental responsibilities in response to intense pressure from both internal and external sources.
2. The companies are experiencing waste reduction and improved green image after the company after the successful adoption of eco-packaging.

Different respondents define eco-packaging according to their knowledge, understanding, and experience. They mentioned different features for the packaging to be considered eco-packaging or to change their traditional packaging into eco-friendly packaging by introducing these features to protect the environment. Their views regarding eco-packaging are more inkling towards moral responsibility and extended producer responsibility for packaging by the company.

These participants also linked waste prevention, less environmental impact, less use of energy, water, and other natural resources, recycling to reused packaging, and environment-friendly materials with eco-packaging. Most of these attributes described by interviewees for eco-packaging are closely related to the definition of eco-innovation given by the OECD in 2009, which is an improved manufacturing process that has a lower impact on the environment or can help prevent more damage from being done to natural resources. In conclusion, we can state that the research participants describe eco-packaging innovation as a source of environmental protection, waste reduction, efficient use of all natural resources, and reduced environmental effect.

The results of this study's investigation of the comprehension and knowledge of eco-packaging innovation by food and drink businesses reveal that these companies have a solid grasp of the idea. These participants have their own specific opinions on eco-packaging as they know how eco-packaging is related to their business and can help it to survive in this competitive situation. Furthermore, it is crucial to realise that previous research on eco-packaging only looked at customer behaviour. Therefore, this is a novel addition to the literature on eco-packaging in terms of the information given by participants who have experienced eco-packaging and can explain the benefits of eco-packaging based on their own experience.

The second goal of this study was to identify several motivating reasons for the use of eco-packaging innovation. These driving factors are divided into three categories external drivers,

managers, and eco-capabilities (internal drivers). These drivers were considered important factors for the different types of eco-innovations. A review of qualitative data showed that only a few other factors, in addition to these ones, are encouraging food and drink productions to use eco-friendly packaging. The main motivations for the adoption of eco-packaging are external ones including consumer expectations, stakeholder pressure, and environmental restrictions in terms of regulations. It is interesting to specify that the first external driver of customer demand is based on environmental concern by the consumers as they are worried about the future generation.

Research participants also an emphasis on environmental regulations and stakeholders' demands as important drivers for eco-packaging. These drivers explain that stakeholders and producers have a genuine concern for the environment therefore they are showing concern to change their packaging materials from traditional plastic and other harmful materials to eco-friendly materials that have less or no harm to the environment.

The adoption of eco-packaging by food and drink firms is also significantly influenced by environmental and packaging waste regulations. These packaging and waste management regulations are packaging promoting waste reduction to save the natural environment. Some participants also mentioned that these legislations including extended producer responsibility for packaging are coercive measures by the government to the producers and manufacturers to think about their packaging waste and take responsibility for their waste otherwise they have to pay the cost of it. Environmental regulations are mentioned as an important driver by many existing researchers for different types of eco-innovations.

Another important factor in the use of eco-packaging is managerial environmental awareness. As managerial decisions are based on his own experience, knowledge, and concerns so if he has awareness of environmental costs that the company must bear in case, they are not adopting eco-packaging they will decide to rethink it. Similarly, to stay competitive in the market managers must follow the trends, changes, and needs of the time.

Eco-innovation mentioned as is a new prevailing concept by most of the interviewees and it is adopted in every field and discipline. Businesses are also innovating in every field including their production, processing, marketing, manufacturing, and technology. Managerial knowledge of the risk that he is taking if he is not introducing eco-innovation in packaging, or his production process will help him to decide whether he wants to adopt eco-packaging or not. Managers also compare costs and monetary benefits for the company. Some participants

identified the ability to compare costs that the company is bearing as a fee for packaging waste management and financial profits that the company can sustain after eco-packaging innovation.

The eco-capabilities of the company make up the third group of eco-packaging innovation drivers. Different respondents discussed these capabilities as a prerequisite for eco-packaging adoption as without these eco-capabilities it will be almost impossible for the company to successfully adopt the change in terms of packaging. The reason behind it is that packaging is an important part of the product and marketing strategy of the company and if the company itself did not have internal capabilities in terms of technology, research, and employee's development then it will be impossible to bring change in the product packaging. Eco-capabilities are divided into three categories in this research and one new category emerged after discussion with the employees from four different food and drink companies. These research participants explain that eco-packaging is adopted by the company after bringing internal technological changes.

These companies introduced new technology as a part of their eco-innovation process. Using less energy and other resources during the production of the packaging and products, this innovative technology is assisting the firm in achieving environmental sustainability goals. This was explained during the interview that this new technology also referred to as eco-technology is helping the company in different types of environmental innovation. For this new technical development in the business, the adoption of eco-packaging innovation, some of the respondent use the same term technological competence. Eco-technology is helping the firms to save the natural environment during their production process and the eco-capabilities of the firm are making it capable of understanding eco-packaging from the environmental point of view.

Another category of eco-capabilities is human resource capabilities. These human resource capabilities are linked with the employee hiring and training process. Some respondents mentioned human resource capabilities as the human capital of the firm that requires long-term investment for the application of the eco-innovation approach of the firm that is already explained in the existed research (Fernández et. al., 2018). The new employee with environmental concern and knowledge of environmental regulations can help the company strictly follow the packaging-related environmental regulations and thus can also help to reduce CO₂ emissions during the production process. By building human resource capabilities the firm can improve the green packaging manufacturing process by efficient use of energy and resources and promotes technological innovations. It is also mentioned that human capabilities

are foundations for eco-packaging adoption as it encourages eco-innovation in packaging along with the increase in overall environmental strategic aims.

The third eco-capability introduced in this study for eco-packaging adoption is the research and development capability of the firm. This research and development capability is also essential for the technological capability of the firm as it can help the company to improve its technology from carbon emission technology to eco-technology that has little or no environmental impact. Some of the respondents linked research and development with eco-research and development as in this research we are considering the investment in research and development to build research and development capability for eco-packaging adoption.

Employees considered research and development as an important part of the eco-packaging adoption process because it helps the process of building technological capabilities that are essential for the innovation process. Additionally, research and development can enhance the company's access to external information for the efficient implementation of packaging improvements that are more environmentally friendly. According to empirical study, a company that invests in its research and development capabilities will be better able to adopt eco-packaging innovation. It is clear from the respondent's views that eco-packaging adoption is linked to green marketing and waste prevention. The companies are taking advantage in terms of environmental advertisement and eco-labelling and green message displays to promote themselves as environmentally friendly companies.

These green marketing strategic tools are promoting the company's efforts in terms of introducing eco-designs and materials for their packaging to make it eco-friendly so that they can have an improved green image. Some participants agree to the fact that they have satisfied their green buyers by using these green marketing tools as a communication medium with these consumers. As these consumers are always in search of making efforts on their behalf to contribute to the environment and eco-labelling is also satisfying them that they are responsible buyers. Similarly, the green message displayed on packaging, advertisements, and social media platforms is also helping food and drink companies to gain consumers' trust as environmentally responsible firms resultantly help the company for the attainment of green image.

The evaluation of eco-effects packaging's on environmentally friendly marketing and waste minimization is the fourth study goal. The empirical findings in terms of waste prevention from eco-packaging adoption by food and drink companies are explained in form of eco-packaging features such as recycling, reuse, reduction, renewal, zero-landfills, and biodegradable

packaging raw materials. This study found that recycling was the most common type of feature introduced by these four case companies for their packaging to be considered eco-packaging for waste prevention purposes and the zero-landfill aim was discussed as a most difficult achievement for food and drink companies as they are still working on it. The participants also highlighted that this recycling feature is helping their companies to reduce raw material costs as they can reuse their recycled packaging as raw material for new eco-packaging.

The study also highlighted the fact that eco-packaging features such as renewable and reusable are also linking it with consumer waste reduction. Buyers can renew this used eco-packaging innovation to anything new to generate income along with a decrease in domestic waste. Similarly, if the consumer is reusing this eco-packaging after one time use as product packaging by the company, they are contributing to waste prevention in the economy. Reduction in the packaging raw materials is also not only reducing the company cost but also decreasing the waste during the packaging manufacturing process.

8.3. Contribution to Knowledge

8.3.1 Core Contributions

This research contributes to the knowledge by extending the knowledge on waste prevention by eliminating plastic packaging and adopting eco-friendly packaging. Research adopts the approach of engaging stakeholders. Collaboration with other organisations, managerial environmental concern, and eco-capabilities to construct a qualitative research context.

By getting significant from the people working within the industry a reasonable amount of empirical data is now available based on the interviews and observations that provide deep insight into different driving forces and changes coming into the sector after reduction in plastic packaging by adopting eco-friendly materials. Additionally, this study supports the link between waste reduction and food and drink firms' use of eco-packaging. The core contribution of the study can be explained as:

- A specific set of external driving factors for food and drink sector are identified for the exclusion of plastic as packaging material and adoption of eco-packaging.
- Managerial environmental concern was identified as an important enabler of plastic packaging prevention for the companies.

- Eco-capabilities were identified to that positively impact the process of eco-packaging adoption within the company. these capabilities are divided into three categories: human, technological capabilities, and research and development capabilities.
- These three major drivers external, managerial environmental concern and eco-capabilities form a framework that explain the reduction in waste can be achieved by the adoption of eco-friendly packaging.
- This study also explain that the adoption of eco-friendly packaging is a transformation management, in which companies open their boundaries for collaboration and create new kind of dependent relationship between brands, stakeholders, and research institutes.

8.3.2. Theoretical Contribution

Eco-packaging innovation is a very important topic these days as it is an essential part of government sustainability agenda and waste management strategies. Eco-innovation is always considered within the limitations of innovation theory. But ecological modernisers are emphasizing using ecological modernisation in different sectors of the economy through eco-innovation. They considered political and social laws very important along with the technological changes. This research is using ecological modernisation theory by using technological changes, government regulations, competitive pressure, and waste prevention as forces for the eco-packaging innovation adoption.

Since most of the study on environmental packaging is conducted from the perspective of consumers, there isn't any research identifying the driving forces for eco-packing innovation. Such as a consumer eco-friendly packaging definitions from consumers perspective (Nguyen et.al., 2020), advantages of eco-friendly packaging in terms of supply chain management (Xin et.al., 2019), eco-friendly packaging determinants, consumer perception of eco-designed packaging (Biswas & Roy, 2015; Magnier and Crié, 2015; Prakash & Pathak, 2017)

There are three main categories of eco-packaging drivers are identified in this research. They are external drivers, managerial environmental concerns, and eco-capabilities. The combination of these drivers for the acceptance of eco-packaging innovation by food and drink companies is contributing to the eco-friendly packaging and eco-innovation literature. It was also noted that customer feedback was also an important contributor to the decision to change the packaging for the food and drink companies. These customers provide their feedback on paper packaging that was introduced for some of the food and drink products by the company to replace traditional plastic. These customers mentioned a few difficulties they are facing while

handling paper packaging so that the company can consider relevant changes in the paper packaging. Thus, customer feedback also affects eco-packaging adoption.

Two new drivers' stakeholders and organizational collaboration also emerged during empirical data analysis. According to the stakeholder approach, businesses should put equal emphasis on long-term environmental plans as they do on short-term objectives (Eesley and Lenox, 2006). Consumers and regulatory authorities are already the stakeholders that are already included in the research framework as drivers for eco-packaging innovation, but the interviewed employee mentioned environmental activists, community groups, and media are also important stakeholders that put pressure on the food and drink companies to rethink packaging.

Managerial environmental concern is based on his knowledge that was considered a driving force for the positive decision on eco-packaging adoption by food and drink companies. Many participants mentioned that their companies are hiring new environmental managers specifically to measure the environmental influence and eco-packaging innovation performance of their company. These environmental managers share their information regarding the company's impact on the environment with the employees and recommend needed changes as well. Similarly, technological capabilities are termed eco-technology and technological innovation by many of the employees. They mentioned that the company innovates existing technology in terms of environmental features introduction in it. The use of less energy, water, and other natural resources is tied to these new characteristics, which aim to safeguard the environment. Managerial cognition helps managers make a connection with internal and external drivers' demand for eco-packaging to avoid operational uncertainty and unpredictable outcomes.

Although firm internal capabilities in form of eco-capabilities are very important for eco-packaging adoption it was also found that collaboration with other research institutions, academics, government research organisations, and packaging manufacturing companies is also very important for the food and drink companies. Collaboration for research and development for understanding new technologies and scientific knowledge (Mittra, 2007). This external collaboration can help to achieve many predictable outcomes through the exchange of ideas and knowledge among company employees. This exchange of knowledge, skills, and technology help the company to build technological capabilities, human capabilities, and research and development capabilities.

Eco-packaging increase brand popularity by communicating the company's commitment and efforts toward the environment (Byrne, 2017), and consumers are showing a positive response to the eco-friendly packaging introduced by the companies (Steenis et. al., 2017). Environmental advertisement, eco-labelling, and green message display are the tools that these food and drink companies are using to attract and encourage buyers towards specific changes adopted by the company to influence them for buying their products by communicating to them that this change is good for the earth. As it is explained by Kumar and Kumar (2017; p. 71), as, *“green advertising is a critical aspect of green marketing that conveys greenness in items, administrations, practices, and procedures of associations”*. Similarly, eco-labels encourage buyers to buy products with such labels to contribute to the environment (Kumar and Kumar, 2017). These people are recycling or reusing these packaging to make their contribution toward carbon footprints. Additionally, it is decided that eco-packaging helps the business image more environmentally friendly (green) while simultaneously increasing sales.

Another contribution of this research is to establish a link between eco-packaging and waste prevention. Eco-packaging is often made of recycled materials therefore it helps to decrease waste during the production process. Biopolymers as sustainable packaging materials are helping waste reduction. It is an eco-friendly packaging material with the ability to be recycled (Khalil et. al., 2014), disposable, compostable, emits less greenhouse gas emissions, and has fewer biochemical effects on the environment (Moon et. al., 2011). Because of these features, eco-packaging materials are contributing to waste prevention not only during the production process but also within the community.

Ecological modernisation (ecological economics perspective) theory is used in this research to link eco-packaging (a form of eco-innovation) with efficient use of energy, waste prevention, and eco-friendly materials. It is argued that ecological modernisation can solve environmental problems and provide environmental benefits through the introduction of new environment-friendly technologies (Murphy and Gouldson, 2000). Eco-packaging is helping to consume fewer materials while fewer emissions during the manufacturing process and introducing innovative technology (use of renewable energy and resources) that are ultimately linked to a reduction in packaging waste.

8.4. Managerial Implications of the Result of this Research

This research is suggesting manager's how to carry out successful adoption of eco-packaging innovation for waste prevention. They can use eco-friendly materials as strategic plan to reduce

packaging, manufacturing process and end-of-production waste for the business. It's crucial to realise that management considerations are a part of the process of adopting eco-packaging, and managers shouldn't focus just on the immediate impact of their organisation adopting eco-packaging. Instead of that managers should consider their cognition, concern for the environment, and long-term benefits from eco-packaging before taking any decision regarding its introduction or adoption.

The study framework is organised into two main components. The first part explains significant drivers that directly affect the adoption of eco-packaging innovation by food and drink industries. The second part explains the impact of eco-packaging innovation adoption in terms of green marketing and waste prevention. Following is the discussion on how managers should apply this research framework to their decision-making and eco-packaging adoption process.

From this research perspective, competitive pressure is an external nonmarket driver, but it has a significant influence on the company's decision regarding introducing changes in the packaging especially eco-friendly changes to make their packaging eco-packaging. Food and drink companies always desire to maintain their competitive position in the industry as food and drinks are fast-moving consumer goods and are a big part of daily consumption. These days these companies are promoting their environmental efforts to create a positive image of their company in the market. Environmental and waste management strategies of different food and drink companies are influencing other companies in the same sector to modify their environmental and other business strategies. These companies observe the change in packaging materials of the competitors, so they also follow the trend by eliminating plastic from their packaging and adding eco-friendly materials to their packaging. But this competitive pressure also depends upon the market environment in which companies operate.

These days many customers can evaluate companies based on their environmental strategies. The government is also contributing to this aspect by educating consumers to become more environmentally responsible for their health and future generation. This is also contributing to encouraging companies to rethink their packaging to satisfy their consumers in a better way. This research is also in favour of the fact that companies should recognise the environmental concern and demands of their potential customers and change their product packaging following that demand. Different features of eco-packaging are highlighted by the companies in their advertisements and labelling to communicate their environment-friendly packaging benefits to the consumers. It is also linked to customer loyalty and many respondents talk about

it during their interviews. Thus, managers should consider customers' demands while deciding for changing their packaging materials.

Managers should understand that adopting eco-packaging can bring a first-mover advantage to their company by improving their market image. Every developed country has environmental regulations to control packaging waste created by companies and consumers. Governments are publicizing their environmental laws and policies to educate consumers about the green marketing claims of production companies. Therefore, managers must consider both government and customers during the implementation of packaging waste-related environmental strategies. The government is also putting penalties on producers the UK has introduced the packaging waste recycling note (PRN) and packaging waste export recycling note (PERN) system as extended producer responsibility for packaging waste on producers. If companies are not doing the minimum to protect them from the penalties, then they must pay for it.

Deposit Refund system:

Managers can introduce a deposit refund system to collect the packaging waste from the consumers directly instead of making it a part of household waste. Company managers should understand that collection of packaging waste directly from the consumers is beneficial for the company as they are not only improving their image in the eyes of consumers but also, they are fulfilling the requirements set out in the environmental regulations. This will resultantly decrease the cost of extended producer responsibility for packaging waste.

Stakeholders' importance:

The manager should also consider different stakeholders' opinions for deciding on environmental strategy for his company. This research already discussed customers and governments (stakeholders) as separate categories of driving factors. Social media influencers and community groups are also highlighted as important stakeholders who are running social media campaigns for environment protection and sharing valuable information with the people living in a community regarding the packaging waste affecting the natural environment and human health. Therefore, managers should keep themselves up to date with social media content and information shared online and offline by these stakeholders. Additionally, managers can also invite these stakeholders to communicate the company's efforts for the prevention of packaging waste so that the company can have a better image in front of consumers and these stakeholders.

Managers should understand why they should have innovation in their production technology as it is essential for the company to smoothly run the process of switching from traditional packaging to eco-packaging. Managers should know different technological capabilities that they can develop in their company for proving it as an environmentally responsible company:

- i. Developing a new technology that reduces waste and helps the company to use eco-materials as their packaging raw material.
- ii. Develop a packaging waste recycling technology for reusing its packaging waste as raw material.
- iii. Introducing innovative and environmentally friendly technology has fewer emissions and uses less energy, water, and other natural resources.
- iv. Building technological capabilities with a renewable energy option to prove technological eco-innovation adoption.

Employee Knowledge and Training:

Managers should understand the importance of employees' training related to the eco-innovation adoption by the company. Employee training and knowledge enhancement regarding environmental issues and changes due to these environmental issues in the industry and within the company should be included in the eco-packaging adoption plan of the company. Managers should know how much and what kind of eco-activities, education, and support is required to build human capabilities for incorporating green aspect into the business.

These capabilities can also be built by communicating eco-friendly strategies to the employees, increasing knowledge within different departments regarding packaging waste-related environmental issues along with the required training, and explaining these environmental changes as a part of company culture to these employees. These efforts by the employer will help employees to understand the reason behind the decision to change product packaging by the company. Managers can convince higher management to invest in the employees even though companies are reluctant to invest in employees as it is a hard job to retain employees.

Research and Development:

Research and development are mainly influenced by market driving forces. Managers should understand the importance of investment in research and development for eco-innovation in terms of saving the company's environmental costs. When companies are adopting eco-packaging, they must consider the change in the traditional technology by replacing it with environmentally friendly or eco-innovation technologies. Therefore, managers should

emphasize research and development especially if they want to get long-term benefits from eco-innovation.

Managers must know research and development capabilities are very important to discover technological capabilities and the right application of these capabilities in terms of eco-innovation. An effort must be made by the manager to convince senior management and company leadership to invest in research and development to understand more about eco-packaging, its benefits to the company, and its impact on waste prevention.

Importance of Collaborations:

Research respondents also explain organisational collaboration as an essential part of building eco-capabilities for the adoption of eco-packaging. These collaborations not only help companies to gain more knowledge regarding environmental policies for packaging and waste management and available research on different eco-packaging within the industry and across different industries. Managers can decide whether they have to collaborate with academic researchers, packaging manufacturing companies, environmental organisations, or research institutions to gain authenticated knowledge on eco-friendly packaging materials, eco-designs, packaging waste recycling infrastructure, and reusing recycled materials as raw materials for new packaging.

Eco-Packaging adoption impact:

Three results are used in the study framework to demonstrate how eco-packaging innovation adoption has a beneficial influence. These are green marketing, green image, and waste prevention. These outcomes are further explained in the following sections.

After the adoption of eco-packaging, companies can promote their eco-packaging with eco-labels on their product packaging. It is a way to promote the greenness of the company's product packaging and can help them to improve its market position. These eco-labels contain all information including eco-friendly raw material sources, distribution of this kind of materials, disposal and recycling, and the quality of these eco-materials in terms of food and drink product requirements. The labels also contain other information i.e., eco-product information, emissions during manufacturing of product or packaging, and resources used for the production process within the company. Here the managers need to review the packaging labels to ensure the up-to-date right information is being communicated to the consumers.

This study shows that green marketing is an essential part of corporate strategy. Companies are understanding public policies for packaging waste, adopting eco-friendly packaging, and using

marketing mix in form of packaging alteration, eco-labels, and environmental advertisement for the company's benefit. Managers should also be now focused on the environmental advertisement to have a positive public opinion for their company. This research also explains the link between individual emotions and care for the environment with environmental advertisements. These individuals are responsible consumers, and their buying decisions depend upon their views regarding any company's eco-friendly positioning within an industry.

An important green marketing tool identified by respondents is a green message display. These messages include important information regarding product packaging eco-friendliness. It also explains how this eco-packaging is contributing to environmental protection by having less impact on the environment. Managers can consider different important messages including recycling, reusing, and renewing information of the product packaging after the use of the product by the consumer. These green messages can explain to consumers how they can contribute to the environment by renewing and reusing the same packaging for many other purposes. This will not only decrease packaging waste from the community but also create a positive image in consumers' minds of the company's efforts.

Study respondents also highlight that after the adoption of eco-packaging and green marketing, companies have improved their image. But to improve their image managers must think about good strategic marketing for highlighting their environmental accomplishments. This can be termed a defensive green strategy of the company for branding purposes. Many respondents explained that they highlighted in their advertisements and promotions that they have a zero plastic waste strategy and have replaced plastic with biodegradable, recycled plastic, paper, and other non-naturally sourced materials as product packaging. Thus, a green marketing strategy can be used as a tool by the company managers to create the company's green image among consumers.

Waste reduction is one of the most crucial results of persuading management to use eco-packaging. Utilizing recycled packaging materials as raw materials has been identified as an efficient waste reduction strategy. Similarly, companies can recycle their production process waste for energy creation and used water can also be recycled and reused. The utilisation of recycled materials as raw materials for production and the creation of packaging might be emphasised in management-developed training programmes for staff. Companies can develop a plan to use waste materials as a substitute for virgin raw materials. This study's respondents claim that one company's waste can also be used as input in other companies to produce different products that can help companies to earn some money through proper handling and

disposal of their waste. For instance, packaging waste can also be used as fuel for energy creation in the same or other industries.

Conclusively above-mentioned explanations can help the manager to understand the importance of different driving factors and build internal firm eco-capabilities for eco-packaging that can help food and drink companies improve their image by gaining a green image and preventing packaging waste.

8.5 Recommendation for Food and drink companies

A few recommendations for eco-packaging adoption for different food and drink companies are explained below:

- Packaging should only be done by focusing on the protection of the item and by keeping the protection aspect in mind online product sellers can reduce the packaging size as much as possible.
- Polyethylene film (plastic) is the least costly, durable, and lightweight eco-packaging material that can be a very good substitute for plastic. Apparel companies can use it very easily for their products.
- Compostable is also a durable, lightweight, and waterproof eco-packaging material. They are often made of bio-based polymers that are easily disposable and create no harm to the natural environment.
- There should be a focus on building internal eco-capabilities in form of technological, human, and research and development. So that there will be smooth systematic adoption of eco-packaging by the company.
- A company should create small groups consisting of representatives from different departments for interaction with the higher management of the company to raise questions, do regular interactions and receive feedback on the performance of their specific department during the eco-innovation implementation process.
- Company managers from all levels and all departments must participate in the packaging eco-innovation adoption process. These managers should have a responsibility to talk to their specific department employees and arrange workshops, seminars, forums, meetings, and other interactive sessions to share technological changes required by the company for eco-packaging and other eco-innovation adoption processes.

- There should be regular research on eco-packaging innovation within the industry, across the industry, and around the world. It will help the company to get the best form of eco-materials and eco-designs for their products.

8.6 Applicability of Findings to other countries

These research findings are in line with UK food and drink industry. This study will provide deep insight into eco-packaging within UK food and drink companies. As the UK is a developed country, therefore, the finding might apply to other developed countries but the same cannot be applied to developing countries as they may not have extended producer responsibility for packaging or packaging waste management laws.

Some developed countries did not also have any specific packaging waste management laws these countries are using general laws for packaging waste prevention. These general regulations are not providing specific tools or obligations to achieve objectives set by the country (Tencati et. al., 2016). As a result, in those nations where there are no particular rules against packaging waste, the study's conclusions do not apply. Canada, France, Belgium, and Spain have EPR principle-based packaging waste prevention programs (Tencati et. al., 2016), and food and drink companies in these countries are also making efforts to stop using plastic as packaging materials and introduce eco-friendly packaging materials to fulfil the packaging waste prevention requirements set by the country law.

There is a lack of infrastructure for waste collection and recycling in most developing countries. A study by Feber et. al., (2021) on China, India, and Indonesia for sustainability in packaging questions three generations of consumers from the mentioned three emerging Asian countries. According to the survey, customers from all three generations in these nations are prepared to pay extra for environmentally friendly packaging, particularly packaging for sustainable foods.

8.7 Limitations of the research

This study used various case studies to examine four food and beverage businesses that employ eco-packing innovation by doing away with conventional plastic in their product packaging. As it was a qualitative case study therefore there were few limitations attached to the process of selecting the number of cases and respondents.

This study is also being done to cover a knowledge gap in the field of sustainability and waste management through zero plastic packaging, and it only focuses on one sector of the economy. So, to get more comprehensive knowledge of eco-packaging, research on different other sectors such as the packaging manufacturing sector is also necessary. Another research can be done on the multiple industries or the comparison of different developed and developing countries' experiences with the environmental packaging laws and eco-packaging adoption by the production companies within those countries.

The samples were selected based on their working experience within the company so that they have better knowledge regarding the eco-packaging adoption process and its influence upon the food and drink manufacturing companies. Another limitation is the country from where empirical data was collected. As the UK is a multi-cultural country where people from different regions and races are working in different industries therefore the study samples are homogeneous, they are not completely the same.

Undeniably, all interviewees were very friendly and happy to share their experiences and knowledge so, it was a pleasant experience for the researcher to interview them. It will be an interesting idea to distribute them into different cultural groups to observe the effect of their culture on their experience, knowledge, and opinion. These cultural values are also linked with the sentiments of the people therefore future research should be careful about including cultural differences in their study.

Interestingly, case D was behind the eco-packaging adoption, and they were also at the very initial stage of the impact they were receiving from eco-packaging adoption. Future research including such companies can help to understand the obstacles they were facing in changing their product packaging from traditional plastic to eco-packaging. Future studies can address these constraints that were discussed before. Additionally, the link between various driving

elements and their effects is not being looked at in this study. As a result, exploring the connections between the study's many themes and sub-themes may form the basis of future research. The suggestions for more study are explained in the section that follows.

8.8. Recommendations for future research

We can consider the following recommendations as opportunities for future research:

1. The research framework is built and applied in the developed country UK context. So, we can this limitation as an opportunity to investigate the eco-packaging innovation phenomenon in the context of developing countries. Some of these developing countries do not have any public regulations for packaging waste. The rationale or driving force behind the adoption of eco-packaging innovation can be better understood by repeating this study in such developing nations where manufacturers are employing eco-packaging innovation and where restrictions are in place. This will demonstrate some brand-new factors that will encourage the adoption of eco-packaging innovation or assist in validating these study findings.
2. The comparison of packaging waste management regulations in developed and developing nations, as well as the impact of these laws on the adoption of eco-packaging innovations, will increase our understanding of how waste management laws are implemented and how packaging materials are changing due to eco-innovation, waste management and circular economy notions globally.
3. This study does not go in-depth on the enhanced producer responsibility for packaging and waste management regulations due to the time limit for this research. Although several responders included waste management, corporate social responsibility, and expanded producer responsibility for the packaging in relation to eco-innovation and eco-packaging. Future research can compare company-based waste management policies and the impact of different countries' and industries' laws on waste management to evaluate the impact of these regulations on eco-packaging or eco-design changes in the packaging.
4. Natural disasters like climate change, natural water scarcity, loss of biodiversity, and health issues caused by environmental deterioration are creating barriers for ecological modernization, even though developed and developing countries are expressing their concerns and efforts for eco-innovation for sustainable development. The speed of ecological modernisation is much slower than the eco-innovation and sustainability process around the world. It is particularly challenging for developing and underdeveloped nations to deal with the pressure brought on by environmental issues and the spread of eco-packaging innovation. There can be a specific

framework introduced by the researcher to create a chain of knowledge for developing countries so that they can easily introduce laws and industrial strategies for ecological modernisation, eco-packaging adoption, and waste prevention.

5. There is different eco-innovative packaging is also being introduced into the market on an experimental basis. These packaging's are eco-friendly but these packaging may not be suitable for food or drinks. Therefore, a study can be done to collect data on different eco-packaging innovations, green packaging, eco-friendly packaging, or sustainable packaging available around the world and can address the possible features of those eco-materials that make them suitable for food and drinks. The same study can also compare the costs being incurred for the manufacturing of such packaging. This will help the food and drink industry to decide which packaging based on features or cost will be best for their products.
6. Future research that assesses financial advantages may also include a quantitative analysis on eco-packaging innovation. For example, quantitative research on the impact of eco-packaging innovation in terms of increase in sales, packaging manufacturing cost reduction, increase in profits, decrease in energy and other inputs cost can help to understand the return on investment and other monetary benefits to the food and drink companies after eco-packaging innovation adoption.
7. Academic perspectives are prevalent in the literature that is currently accessible on eco-packaging innovations. However, it can also be evident that the packaging manufacturing agencies are also working on eco-design for packaging and there is many new eco-friendly packaging available in the market. Many businesses are working on circular economy characteristics-based eco-packaging innovation (Dell, 2018; Sidel Limited, 2020, The Body Shop International Limited, 2021), Lush Retails Limited, 2021). Industrial efforts should be a part of future research to understand different types of eco-packaging innovations existing in the business sector.
8. Future research can highlight different packaging waste collection options available in the country for the proper treatment of eco-packaging instead of making it a part of the landfills. Some of the food and drink companies are taking trials on a deposit refund system, discount on buying reusable bottles and cups, and get £1 after returning reusable packaging. In the coming years, the research on these schemes for the collection of packaging by the company itself will help to motivate other companies.

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APPENDIX I: PARTICIPANT INFORMATION SHEET

Research Title: Eco-innovation in Packaging for Environment and Waste Prevention **(Multiple Case Study in the Food and Drinks Industry)**

Invitation to participate

The packaging is an important component to be considered for the accomplishment of sustainability aim, which is clearly about minimising the environmental impact of food packaging on the earth. The promotion of packaging eco-innovation with the help of environmental regulations is an essential step towards this sustainability aim from the UK government. This innovative food packaging did not only address the food waste problems but also help companies in their waste management strategy. Additionally, innovative packaging should also solve the traditional plastic accretion and waste management issues. The decision of eco-packaging adoption is influenced by many factors. This researcher proposes to undertake an empirical study of the UK food and drink sector to understand the determinants of eco-packaging adoption and its impact on waste management and green marketing. You are being asked to take part in this research because your business is in the food and drink sector therefore, you can provide important information, which will be useful for the research. Please read this information sheet for further details and what it means to participate in the study

Purpose of the study

This research aims to explore and understand the adoption of waste-reducing eco-packaging innovations by the UK Food and drink sector. The researcher hopes to gain insights into your perspective of green packaging, eco-packaging innovation adoption, the extent of eco-packaging adoption, and the impact of eco-packaging innovation adoption on waste management and in terms of green marketing.

Interview Process

The researcher will want to interview you. This should take no longer than *60-80 minutes* and will take place online due to the current economic condition (COVID-19). The researcher may ask for relevant documents or sources accessible for this research (optional). The interview will be recorded, and you will be asked to give consent before the interview.

What will happen to the information collected?

All information collected will be stored anonymously. The analysis of the information will be undertaken by the researcher at “Newcastle University London”. Only the researcher will be privy to the notes, documents, recordings, and the report on the findings. Afterward, notes and documents will be destroyed, and recordings erased. The researcher will keep transcriptions of the recordings and a copy of the paper but will treat them with the strictest confidentiality. No participants will be identified in future publications and every effort will be made to disguise their identity.

Declaration to participants

If you take part in the study, you have the right to:

- Refuse to answer any question, and to withdraw from the study at any time (including after the interview has been completed).
- Ask any further questions about the study that occurs to you during your participation.
- Be given access to a summary of findings from the study when it is concluded.

Who is responsible?

If you have any questions or concerns about the project, either now or in the future, please feel free to contact either:

- **Researcher:** Samina Sumrin (Newcastle University Business School, NCL). E: b7068075@ncl.ac.uk
- **Professor:** Suraksha Gupta (Professor of Marketing, Newcastle University Business School, NCL). E: suraksha.gupta@ncl.ac.uk

APPENDIX II: PARTICIPANT CONSENT FORM

Research Title: Eco-innovation in Packaging for Environment and Waste Prevention (Multiple Case Study in the Food and Drinks Industry)

Consent Form for Participants

I have read the Participant Information Sheet for this study and have had the details of the study explained to me. My questions about the study have been answered to my satisfaction, and I understand that I may ask further questions at any time. I also understand that I am free to withdraw from the study at any time or to decline to answer any questions in the study. I understand I can withdraw any information I have provided up until the researcher has commenced analysis of my data. I agree to provide information to the researchers under the conditions of confidentiality set out on the Participant Information Sheet. I agree to participate in this study under the conditions set out in the Participant Information Sheet.

Position in the Company:

Duration of Employment: _____

Signed: _____

Name: _____

Interviewer: _____

Date: _____

APPENDIX III: INTERVIEW PROTOCOL GUIDE

Interview Protocol Guide

The interview process is being developed based on reviewed literature and discussions with supervisors and colleagues. Participants to be interviewed are food and drink packaging manufacturing firms within the UK. Questions are semi-structured to provide directions and focus during the interview while maintaining flexibility. The focus of the study is to understand the adoption of eco-packaging innovations by the UK food and drink sector. The unit of analysis for the study will be the “food and drink sector”.

Purpose: General Information

1. Company/organisation products?
2. Participants position/role within the company?
3. How many people does company currently employ?
4. An estimate of company's annual turnover in UK?
5. Since how long has this business existed?

Eco-packaging Innovation Awareness

1. What does eco-innovation in terms of packaging mean to you?
 - What sort of packaging comes to your mind in terms of eco-innovation? Please recall as much as you can.....
(Packaging- polystyrenes, paper, reusable, recycle, renew, etc)
 - When did you first hear, learn, or read about eco-packaging innovation?
(To assess knowledge and awareness of eco-innovations in packaging)
2. Do you think addressing packaging-related environmental issues is necessary for the UK food and drink sector?
3. Could you discuss how packaging-related environmental issues/green issues have integrated with your business values?
packaging Waste is often cited in publications as a key problem area for the food and drink industry, why do you think this continues to be an issue for your industry?
Are there any other reasons?
(Attitude, Beliefs, types of adoption, strategy, communication)
4. How would you describe the changes in packaging in terms of environment initiative (eco-packaging) by your company?

5. Do you consider your product packaging to be more environmentally friendly when compared to your competitors?

- **Yes**- in what ways?

When did you begin adoption?

-**No**- are you considering any changes in your packaging in the future?

are there specific practices you plan to adopt?

6. Which specific packaging-related environmental initiative has your company implemented, to be packaging eco-innovative?

-Did your company is certified by any environmental organizations? (ISO 14001, EMAS, etc)

-Did your company introduced any packaging waste management strategy? (less carbon emission, reusable energy, less water)

-Does your product packaging get recycled

If Yes- how often?

If- No- greenwashing (only claim in the website and official papers without any practical implementation)

-Can you please explain these features in terms of your product packaging

(Reusable, Renewable, Reduce, Repair, Recover)

Drivers for the adoption of eco-packaging innovations

7. In your view, what are the main internal and external driving forces/reasons behind the adoption of eco-packaging? Please tell me as many as you can think of.....

(Competitive pressure, customers demand eco-packaging, legislative compliance, costs, reputation, market expectations, move towards sustainability, waste, energy)

8. Is your company/organisation involved in any environmental partnership, collaborative initiatives, or certified by any of the environmental management organizations?

9. Who is responsible for your company's environmental strategy and decisions relating to packaging eco-innovations?

-Environmental impact of product packaging, waste management

10. How much value is given to manager views in the decision-making process of eco-packaging adoption?

-Do your manager's opinion and knowledge impact the company's decision to adopt or not to adopt eco-packaging, as an environmental initiative?

-Does the manager's environmental cost(benefits) concern have an impact on the eco-packaging adoption decision?

11. In your view, does your company has adequate resources (capabilities) to support decisions relating to the adoption of eco-packaging?

-Which resources are essential for the eco-packaging adoption process?

-Can you explain what kind of research & development and technical changes are necessary for eco-packaging adoption? Can you please give an example?

-How would you explain the resources requires to build human capabilities for the adoption of eco-packaging?

-Have you introduced new technology and training for employees before the introduction of eco-packaging?

Impact of eco-packaging innovation adoption

12. What are your views on promoting your Company as environmentally responsible?

13. How do you measure the benefits that eco-packaging adoption has brought to your company?

Can you give an example?

(Waste reduction, green image, higher financial returns, social values, customer loyalty, environmentally responsible)

14. How does your company/organisation advertise (or market) your environmental initiative with your current and prospective customers?

(eco-labelling, environmental advertisement, green marketing)

15. How does your company trace/document your on-going business performance after eco-packaging adoption?

(Waste prevention, green brand image)

16. What do you think can be done to further increase eco-packaging adoption by the businesses operating in your sector?

-Do you feel adequate support and infrastructure have been made available to support the adoption of green initiatives by businesses?

17. Is there anything else you would like to share on the topic?

Thank you.

APPENDIX IV: INTERVIEW DESIGN SHEET

Research Title: Eco-innovation in Packaging for Environment and Waste Prevention (Multiple Case Study in the Food and Drinks Industry)

Based on the research aims the central question of this study is:

What are the major driving factors for the adoption of eco-innovation in packaging for waste prevention and green brand image?

And four research sub-questions are proposed.

- i. How do external driving factors affect the Eco-innovation in packaging for environment and waste prevention by the food and drink industry?
- ii. How do managerial environmental concerns is linked with the Eco-innovation in packaging for environment and waste prevention by the food and drink industry?
- iii. How do Eco-capabilities affect the Eco-innovation in packaging for environment and waste prevention by the food and drink industry?
- iv. How does Eco-innovation in packaging is helping to prevent waste and affect the green marketing strategy of the company?

Interview Questions	Specific Probes/ follow-up	General Prompts	Role of Questions	Emerging Themes	Others
Tell me about your Business	<ul style="list-style-type: none"> -What does your business do / what kind of packaging do you manufacture? -How long has this business existed? -What is your role within the business? -How many people do you employ? -Who are your target customers? -Can you give an estimate of your annual turnover? 		General introduction and business characterisation		Request for background documents, brochures annual reviews etc
Interview Questions	Specific Probes/ follow-up	General Prompts	Role of Questions	Emerging Themes	Others
<p>What does be Eco-packaging mean to you?</p> <p>When you think of eco/green in terms of packaging, what sort of practices comes to mind?</p>	<ul style="list-style-type: none"> -When did you first hear of eco-packaging? -Which aspects of your packaging have an environmental impact? e.g. Packaging polystyrenes, polyethylene, biopolymers, recycling. 	<p>Can you give an example?</p> <p>Can you explain what you mean by that?</p>	<ul style="list-style-type: none"> -To assess knowledge and awareness of eco-packaging innovations -Establish understanding of eco-packaging innovation -Linked to RQ1 	<ul style="list-style-type: none"> - Definition of green/Eco -Awareness knowledge of eco-packaging innovation -Extent of awareness -Environmental Impact of business 	<p>Observation of business conduct</p> <p>Evidence of green/eco-packaging promotions</p>
Interview Questions	Specific Probes/ follow-up	General Prompts	Role of Questions	Emerging Themes	Others
In what ways do you think eco-packaging adoption is a	Waste management and environmental problems are often cited in publications		-To determine the importance placed on eco-packaging	-Attitudes, beliefs, and values	

<p>concern for the UK food and drink sector firms?</p> <p>Or in what ways do you think eco-packaging adoption is relevant to the UK food and drink sector firms?</p>	<p>as key problem areas for the UK food and drink sector,</p> <p>why do you think this continues to be an issue for your industry?</p> <p>Are there any other reasons?</p>		<p>innovation by UK food and drink packaging manufacturers</p> <p>-Linked to RQ2</p>	<p>-Strategy (importance vs place) Adoption</p> <p>Classification/ Types</p> <p>-Promotion/ Communication</p>	
Interview Questions	Specific Probes/ follow-up	General Prompts	Role of Questions	Emerging Themes	Others
<p>How would you describe eco-innovation in packaging or Eco-packaging?</p> <p>Do you consider your packaging to be environmentally friendly?</p>	<p>- Yes- in what ways?</p> <p>-No- are you considering adoption in the future?</p> <p>-When did you begin adoption?</p>	<p>-Why have you taken this approach?</p> <p>-How did you initiate these?</p>	<p>-To understand how the firms adopt eco packaging innovation</p> <p>-Linked to RQ4</p>	<p>-Types of eco-packaging for adoption</p> <p>-Green washing (likely evidenced through a mismatch in attitude and values, motivation for adoption and ongoing adoption)</p>	<p>-Waste management</p> <p>- Diffusion profile</p> <p>-Extended Producer Responsibility</p>

<p>Can you explain the considerations behind the adoption of eco-packaging innovation for your business?</p>	<p>-Do you consider any of them a reason for eco-packaging adoption:</p> <p>Competitive Pressure, Customers Green Demand, Environmental Regulations</p>	<p>-Are you involved in any partnerships or Collaborations for eco-packaging adoption initiative?</p>	<p>- To understand driving factors behind eco-packaging adoption</p>	<p>-External Demand for eco-packaging</p> <p>-Eco-packaging adoption process</p>	
<p>What kind of measures you have used to make your packaging eco-friendlier?</p>	<p>- Are there specific practices you plan to adopt for your product packaging?</p> <p>-In what ways is your company trying to be more environmentally sustainable packaging manufacturer?</p>	<p>-How does your business publicize or market your environmental performances?</p>	<p>- To understand the process of eco-packaging innovation</p>		
<p>What kind of internal measures/changes are needed for the adoption of eco-packaging by the firm?</p>	<p>-Do you feel technological changes and human knowledge is essential part of eco-packaging adoption process?</p>				

<p>How do you stay informed on eco-packaging innovations as a green initiative that can be adopted to improve your Environmental performance as a business?</p>	<p>-Are you registered with or certified by any environmental organizations? (e.g. ISO 14001, EMAS, etc)</p> <p>-Do you have a business environmental policy?</p> <p>-What type of your packaging gets recycled and how often?</p> <p>- How do you measure or track your environmental Performance?</p>	<p>-Can you explain what kind of organisational and technical changes are necessary for eco-packaging adoption?</p> <p>Can you please give an example?</p> <p>-How did you roll this out across the company/among staff? (Have you done any training/ How regular are the trainings?)</p>		<p>-Eco-capabilities needed for eco-packaging innovation</p>	
<p>Interview Questions</p>	<p>Specific Probes/ follow-up</p>	<p>General Prompts</p>	<p>Role of Questions</p>	<p>Emerging Themes</p>	<p>Others</p>
<p>Who is the main decision maker to adopt eco-packaging?</p>	<p>- is there any role played by managers environmental knowledge in eco-packaging adoption decision?</p> <p>-Do you think managers environmental knowledge and concern for business (costs/benefits) have an impact on the eco-packaging adoption decision?</p>	<p>Where do you think the biggest motivator for eco-packaging is?</p>	<p>-To determine the drivers and inhibitors to adoption</p> <p>-Linked to RQ3</p>	<p>- managerial environmental awareness as eco-packaging innovation driver</p>	<p>Evidence of such benefits (e.g. higher financial returns, social values, customer loyalty, boosts company</p>

<p>Why any of your business manager/decision maker chosen to adopt or not to adopt eco-packaging as green initiative?</p> <p>What changes/differences would you say eco-packaging adoption has brought to your business?</p>	<p>-What are the key problem areas? And adoption requirements/difficulties</p> <p>-What about packaging waste management and recycling?</p> <p>-Did your company use green marketing to inform customers about your company environmental initiative in terms of eco-packaging?</p> <p>-How have you measured (determined) these benefits?</p>			<p>Conditions-</p> <ul style="list-style-type: none"> - Needs/Problems -Innovativeness -Societal norms <p>-Perceived attributes of eco-packaging innovation adoption</p> <ul style="list-style-type: none"> -Relative advantage -Green marketing -Waste management 	<p>image, environmentally responsible, waste management, recycling)</p>
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Is there anything else you would like to share on the topic		Are there any other driving factors?			
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APPENDIX V: Coding Framework for this Research

Name
Eco-Packaging Awareness in Food and Drink Sector
Background Knowledge and Learning Experience
Define Eco-packaging
Personal knowledge and Understanding for Eco-packaging
External Drivers
Customers Demand
Competitive Pressure
Environmental Regulations
Stakeholders
Managerial Environmental Concern
Managerial Risk Awareness
Managerial Cost/Benefit Awareness
Eco-Capabilities
Technological Capabilities
Human Capabilities
Research and Development Capabilities
Organisational Collaboration
Impact of Eco-Packaging
Green Marketing
Green Image
Eco-labelling
Green Message Display
Social Media

Loyalty
Waste Prevention
Bio-degradable
Paper and Recycled Paper
Reusable
Reduced
Recyclable
Renewable
Waste Recycling and reuse
Less Water Waste
Less use of natural resources
Energy renewal
Greenhouse Gas Emissions

