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Concepts of Sustainable Supply-Chain Management and its Application in Consumer-Packaged Goods (CPG)-industries

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RESEARCH THESIS

CONCEPTS OF SUSTAINABLE SUPPLY-CHAIN MANAGEMENT AND ITS APPLICATION IN CONSUMER-PACKAGED GOODS (CPG)-INDUSTRIES

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Sincerely:

Rohan Rai,
SP Jain School of Global Management

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ABSTRACT

With the rising rate of outdoor pollution at a rate of 8%, in the last five years, and the increase in Global Warming at an alarming rate of 71% between 1993-2018, the sea-level has been increased by 43%. Due to these consequences, industries have been forced to transform their entire Operations and Supply Chain activities, from the conventional methodology to a much technically oriented and advanced one. This paradigm shift has led to the adoption of a greener and a leaner supply chain management practice for the companies. Implementing the same has led to an overall increase in the Profitability, Waste Management, an overall reduction in Carbon foot-print generation, and promotion of a very transparent flow of processes. Companies have enhanced their Sustainable Developmental Goals and pledged to go carbon neutral and eliminate the use of coal from their supply chain by 2025-30. The mega-retailers of CPG such as Walmart, Unilever, Procter and Gamble, Marico, e-retailers such as Amazon, Alibaba, etc, all have shifted to greener medium of supplying and distribution, which has immensely changed their way of Operations in the business. This is so because CPG/FMCG (Fast Moving Consumer Goods) and retail comprise up of 60% waste generation and an indirect or direct Carbon generation in the atmosphere. Thus, they have a keen role to play in minimizing the same and so following the same, Companies of especially in the field of Retail business, have become much more responsible and have started contributing positively towards the environment and society, to tackle the drastically rising issues of climate change and pollution. Something much more peculiar which has gradually happened over the days passed by is that, the initial motive of application of Sustainability measures in their regular supply chain by the companies, which was to tackle climate change and avoid the use of polluting agents have entirely changed the theme of production and has evolved as a subject on its own, which is termed as Sustainable Supply Chain management. Gradually the industries realized that this subject is not merely meant for climate control but has a holistic effect over their day to day functioning and operations too, leading to immense benefits of a leaner industry. Moreover, the disruptions created by the Corona Virus pandemic has shaken-up the business globally and has forced them to think for solutions which can entail in sustainability for the businesses to proposed or else surviving in such an uncertain era would be a challenge for everyone.

IMPORTANCE and SIGNIFICANCE:

The project research on this specific topic will help the booming professional aspirants to learn and analyse the key prospects of developments that are going on in the field of Global Supply chain management for the promotion of sustainability, especially in the present case scenario when the uncertainty is at its highest peak because of the pandemic of COVID-19. These upcoming practices and techniques are going to be the future for a lean and green Supply Chain Management of any company.

CONTRIBUTION TOWARDS INDUSTRY PRACTICES:

The application of sustainable measures in the day to day operational activities of a company will make it holistically lean and green. This will help the industries to minimize waste reduction, thus cutting down their Operational Costs and Increasing Profitability. Inculcating sustainability in the Supply Chain will further increase the efficiency of the product flow and output production of an organization. With a shift in the entire methodology, of operations, because of the Corona Virus pandemic, the new normal is to be created and practiced which requires the supply chain to become highly sustainable. There will also be an impact on the supply chain Transparency of organizations which will further increase the confidence of its stakeholders in it. This is how the implementation of the research on the sustainable supply chain, will contribute positively to the existing Industrial practices.

EXECUTIVE SUMMARY

The rise in global emissions is at record high as compare to that in the last decade. The environment is getting degraded and the temperature of the mother earth is rising gradually. The main drivers behind this is the marathon which the Human's are running continuously without stopping. The race towards development is good but it doing so at the cost of the environment is not at all acceptable. Maximum amount of emissions is generated from the flow of operational activities which is defined as the supply chain of the company. Therefore, there is a serious need for the organisations worldwide to revamp their supply chain and thus, the companies need to become responsible for the same.

A step of responsibility taken by industries to modify the supply chain can be done by following the proactive and benefitting principles of Sustainable Supply Chain. This practice involves strategizing the supply chain in such a manner such that the business achieves environmental, economical as well as communal prosperity and becomes shielded to encounter any type of crisis or uncertainty like the presently going on Co-Vid19 pandemic.

The research covers the aspects of Sustainable Supply Chain in depth, as the research findings. Further, the role of CPG industries has been immense in provoking the emissions and wastages through the process of manufacturing, packaging and the logistics activities which are carried by them for their products of diverse product line. Therefore, the steps and techniques to curb these ill effects which have been taken by them have also been discussed and covered. Furthermore, there are several companies who are contributing effectively towards the generation of sustainable solutions of the stakeholders of an organisation such as for the suppliers, distributors, customers and the employees working there itself. Accrediting them is very much essential.

Lastly it can be inferred that implementing sustainable measures must be done as per the nature and financial capability of the business rather than just simply imposing the same. Then only the maximum benefit will be extracted out them and transform the supply chain to a Value Chain.

CHAPTER:1 INTRODUCTION

1.1. BACKGROUND OF THE TOPIC

Earth can be considered as the most beautiful abode created in this Universe. This is so because it houses and gives life to numerous living beings who possess different characteristics to support their life chain cycle, creating an eco-system. The eco-system requires a symbiotic harmony of several creatures who are its stakeholders to support and ensure a proper circulation of the resources including food and an apt maintenance of the life chain. A disruption of any sort in the functioning by any of the living being, has a straight away impact on the eco-system. Similar disruption which is disturbing the entire environmental eco system is being happening in the past few years, by the negative commissioning of the human beings. The humans, for their self-interest and with the jargonised term of Development are exploiting the entire natural resources available on planet Earth and causing an ecological imbalance. The natural land and forest are being devasted for the sake of fulfilment of the self-needs. Similar is the case for other complimentary resources too. The humans and their activities are the sole stakeholders in bringing by, the phenomena of a negative climate change. This is giving rise to repetitive disruptions and pollutions in Air, Water as well as Land. The harmful emissions released in the air has been increased by more than 68% in the previous 5 years, whereas global warming and water pollution has led to almost 50% reduction in the marine species in the last 40 years (WWF, 2019).

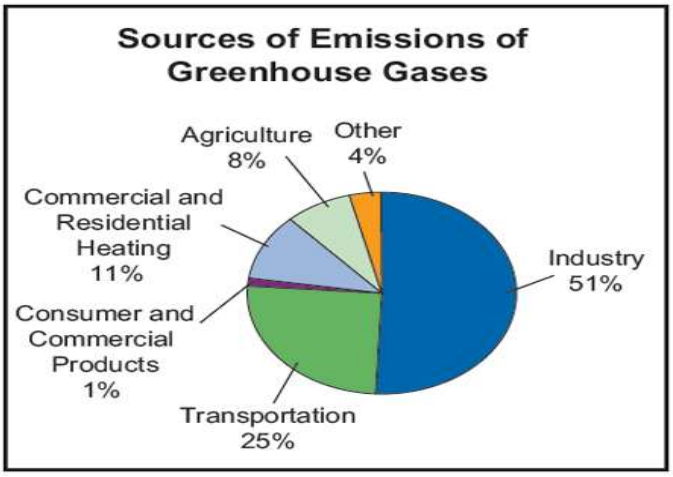

Fig 1.1: Sources of Harmful Emissions
Source: www.ec.canada.com

With the rising rate of outdoor pollution at a rate of 8%, in the last five years and the increase in Global Warming at an alarming rate of 71% in between 1993-2018, the sea-level has been increased by 43%. With industrial pollution contributing more than 50% to the waste released in all the three horizons comprising of Air, Water and Land, there is a serious need for the industrial stakeholders of the eco system to re-plan and re-design their entire production and operation procedure, so that the per capita emission is released to a decent value, within the upcoming 5-7 years, or else there will be a drastic and disastrous impact of the same on climate change (WWF, 2020).

Due to these consequences, industries have been forced to transform their entire Operations and Supply Chain activities, from the conventional methodology to a much technically oriented and advanced one.

1.2. SUSTAINABLE SUPPLY CHAIN MANAGEMENT AND ROLE OF FMCG-RETAIL

The paradigm shift of industrial methods and operations towards the concept of a Green Supply Chain Management, has made the industries and organisations to adopt the sustainable methodologies of a Greener and a Leaner supply chain management practices. The meaning of a fully planned Sustainable supply chain management, not only has to deal with the benefitting of the environment, but Implementing the same leads to a set of rewarding benefits such as an overall increase in the Profitability, Waste Management, Reduction in Overall Carbon foot-print generation, and Promotion of a very transparent flow of processes.

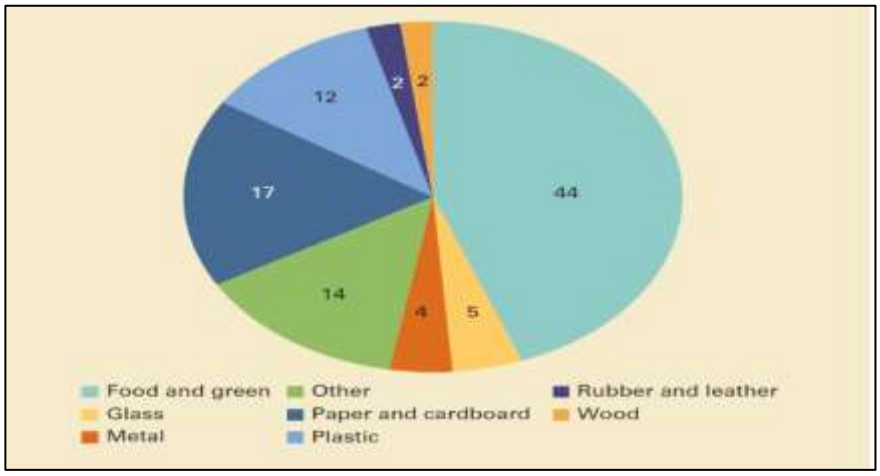

Fig 1.2: Weekly Waste Generation from Commodities of day to day use
Source: www.datatopics.worldbank.org

Companies have enhanced their Sustainable Developmental Goals, and pledged to go carbon neutral and eliminate the use of coal from their supply chain completely by 2025-30 (John Vidal,

2018). From the fig 1.2, it is well evident that close to 44% of the waste generated in the compost sites are from CPG retailers of commodities comprising food and other green eatables. The other products from the shelves of FMCG Retail like paper and cardboard and plastic products which are used for packaging the Fast-moving goods, are also on a verge of high, in terms of contribution of day to day waste generation. This has bought a change in the pattern of functioning of the supply chain of the companies, related to the same. CPG retail comprises up of 61% waste generation and an indirect or direct Carbon generation in the atmosphere (The World Bank, 2019). Thus, they have a keen role to play in minimising the same and so following the same, Companies of especially in the field of Retail business, have become much more responsible and have started contributing positively towards the environment and society, to tackle the drastically rising issues of climate change and pollution. Mega retailers of CPG such as the Walmart, Unilever, Procter and Gamble, Marico, e-retailers such as Amazon, Alibaba, etc, have taken the responsibility of contributing directly or indirectly towards the waste generation and pollution and all of them have shifted to a greener medium for supply and distribution functions, which has immensely changed their way of Operations in the business (Kodiak Rating Company, 2018).

Something much more peculiar which has gradually happened over the days passed by is that, the initial motive of application of Sustainability measures in their regular supply chain by the companies, which was to tackle climate change and avoid the use of polluting agents have entirely changed the theme of production and has evolved as a subject on its own, which is termed as Sustainable Supply Chain management. The Implementation of an integrated- green and lean supply chain in the day to day operations of the companies has led to 32% annual cost reduction and a profit maximisation of 11-13% approximately, per quarter. Gradually the facts and figures, made the industries realised that this subject is not merely meant for climate control but has a holistic effect over their day to day functioning and operations too, leading to immense benefits of a leaner industry.

1.3. NEED FOR STUDY

1.3.1. WHY SUSTAINABLE SUPPLY CHAIN?

Fig 1.1, clearly demonstrates that the emissions have risen by more then 68% just in the last five years of span of time. Moreover, as mentioned in section 1.2 there has been 50% decline in the

marine life and so complementing there has also been a 71% increase in the global warming percentage in between 1993 and 2018. Industries are the major source of greenhouse gases and pollution with a contribution of more than 50%, apart from all other sectors.

It can be also be seen that the levels of waste rise with a rise in the income of the countries the extent of Recyclable waste decreases with a decrease in the income of the countries (World Bank,2019).

Therefore, it has become important to pursue the study of sustainable supply chain management and implement the same in the industries as well, so that there can be a reduction in the total emission percentages and other toxic wastes released and hence, it was chosen as the subject of the research.

1.3.2. WHY CPG-RETAIL?

Fig 1.2, clearly states that wastes released 61% of the total waste generated, comes from the Food, Green and dry wastes generated by the companies. The CPG-Retail companies are the major source for this. So, this means that there is a serious need for these industries to look in to the subject and modify the workings of their supply chain. Many FMCG and Retail industries such as P&G, Marico, Best Price by Walmart, 7-11, Fair Price, Costco, Coles, Woolworths, D-Mart, Big Bazar by future Retails and many more in the APAC and Oceania region have taken the pledge of going carbon neutral and reducing the footprint to 0% by 2025. Also, they have adopted several Sustainable Development Goals, which will be a great area for doing the research upon.

Therefore, the CPG-Retail was chosen as the key Industry for the research.

1.3.3. WHY MANUFACTUTING AND LOGISTICS?

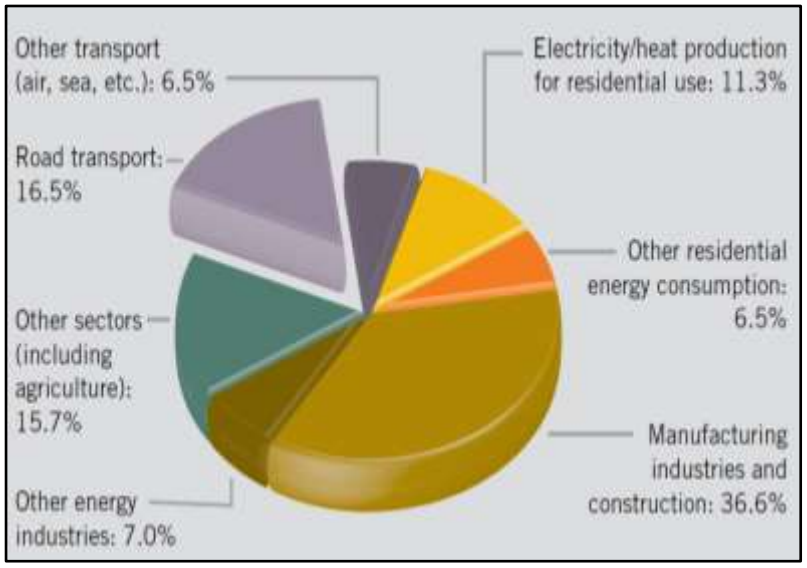

Fig 1.3: Emissions of CPG/FMCG companies
Source: www.internationalenergyagency.com

It can be inferred from Fig 1.3, that Logistics operations pursued by the fast moving consumer good companies contribute to more than 22% of the entire emissions and pollutions related to air, water and land. So, it has a major deal to crack with sustainability and for curbing the same. Complementing to this the Manufacturing and Industrial activity are undoubtedly the old members of the list of harmful emitters, with a contribution percentage of more than 36% in total.

Hence, the manufacturing and Logistics activities were selected as the subsection for the area of research.

1.3.4. WHY PACAKGING?

The packaging wastes generated from FMCG companies are around 146 Million Tonne per year, which is immense and so it is important to tackle this rising issue with grave concerns. Fig 1.4, clearly validates the argument as well, and it can be observed that the rest wastes are not even at 100 Million Tonnes as compared to that of packaging. Packaging wastes includes dry wastes such as plastics, glass, wrappers, single-use non-biodegradable substances, different types of polymers and many more substances which are unacceptable by the mother Earth.

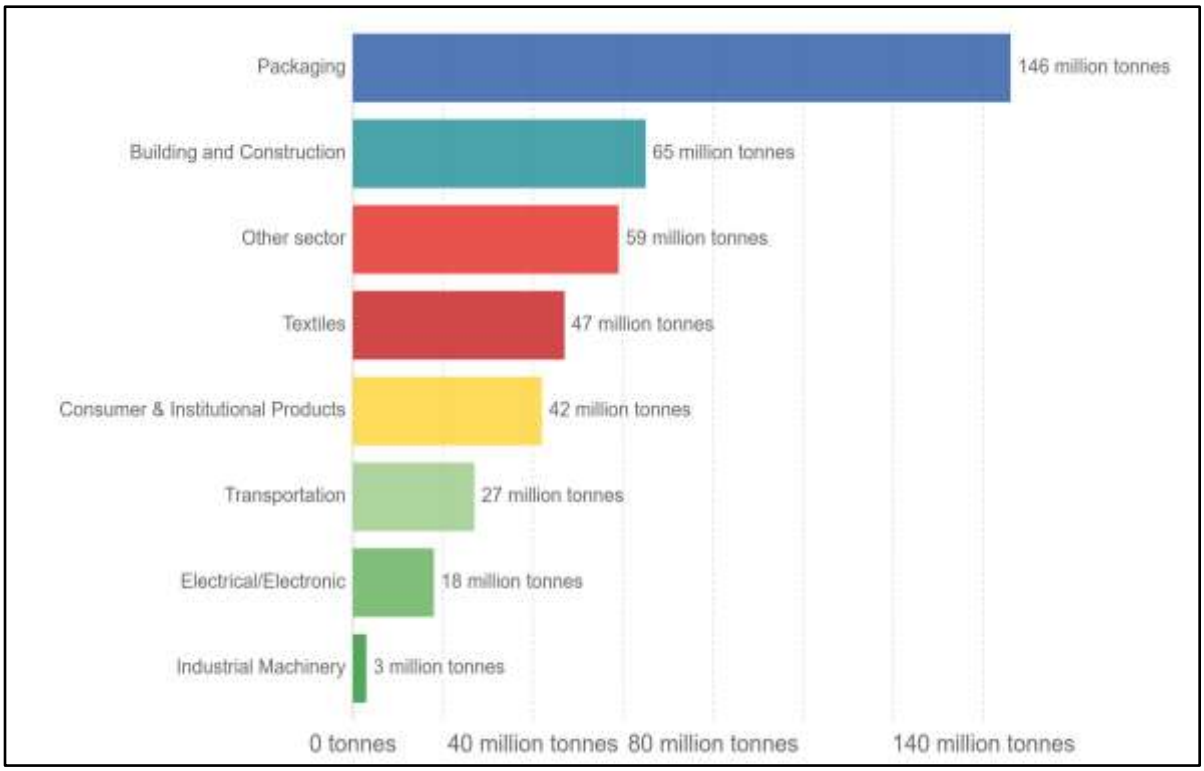

Fig 1.4: Wastes by FMCG Retail companies
Source: www.geyer.et.al

Hence, Packaging in addition with manufacturing and logistics processes was chosen as a subject of the research.

Therefore, form the above-mentioned sub-sections of 1.3.1, 1.3.2, 1.3.3 and 1.3.4, the need for study is clearly justified.

1.4. GAP ADDRESSALS BY THE RESEARCH

The research will serve as a key medium in understanding the role of suppliers and distributors, in the regular supply chain of several CPG mammoth retailers after the implementation of sustainability measures and highlight the cost comparisons of the procedures, of before and after the implementation of greener methodologies from the conventional ones. Moreover, it will set up a secondary research of exploratory nature which may serve as a reference for the Micro, Small and Medium Enterprises (MSMEs), about the key steps taken by the large-scale retailers towards the implementation of sustainability in their day to day operation and supply chain cycle.

1.5. RESEARCH OBJECTIVES

1. To study about the concept of Sustainable Supply Chain management and to research upon the emerging and innovative techniques which companies can inculcate in their regular supply chain and operations to promote sustainability in terms of reduction of carbon footprint and other sustainability factors.

2. To study the sustainable activities involved by Retailers and sellers of CPG products, in their supply chain for improvement of performance and sustainability and to focus on, how the concepts of Circular economy can be bought in to use in the area of packaging, manufacturing and logistics of CPG-Retail industries.

3. To find out about the Supply chain collaborations for promotion of sustainability in CPG-Retail sector.

4. To draw out a cost comparison of the changes in the overall costs incurred after and before the implementation of sustainable measures in the Manufacturing, Logistics and Packaging of CPGs.

5. To figure out the emerging companies which are contributing their part effectively towards the integration of a sustainable and lean supply chain.

1.6. RESEARCH QUESTIONS-

1. What is the concept of Sustainable Supply Chain and what are the emerging trends as well as techniques associated with it?

2. What are the steps and measures taken by the FMCG majors in their supply chain to boost the productivity and sustainability of their supply chain?

3. What are the major collaborations and joint ventures, which are happening to promote sustainable supply chain?

4. What are the cost differences, before and after the implementation of a sustainable supply chain?

5. Who are the market leaders in the adoption of a sustainable supply chain and how are they doing the same?

CHAPTER:2 LITERATURE REVIEW

The abode of living is gradually and steadily entering in to a situation of turmoil. There are various factors which are contributing to the development of such scenarios. Excessive exploitation of natural resources namely food, water, fossil fuels, energy, chemicals and minerals are being observed and this is in complement with the increasing utilization of man-made resources such as lifestyle equipment, luxurious appliances, industries, electrical consumables, etc. which have become a part of the lifestyle of the public all across the globe. The increase and development of man-made resources are directly proportional to the exploitation rate of the natural resources. Humans have left no stone un-turned in the process of degrading the quality and quantity of food grains, drinking water, natural sources of energy and many others. Along with this the setting up of industries on a daily basis, which is also the man-made source of wealth generation is depleting and exploiting the climate parallelly. Climate change and rising amount of pollutions in all the spheres of air, water and land has been a topic of major concern in the past decade of 2009-2019, as the pollution has been on record highs, despite of the several steps, which have been taken by the countries and companies to counter it. The clear meaning of this is that, enough is not being done towards this or else the results would have been visible accordingly. Everyone in the human chain simply talks about the issues but, no one bothers to look after the implementations which are to be done to curb the environmental degradation. The amount of industrial waste and the household waste generated, has been piling up like a mountain of numbers and reaching newer heights daily, which should not be the case ideally. There is a clear evidence that with the fast-paced development of countries, their contribution towards waste generation is increasing exponentially. The industries have been spotted displaying a very casual approach towards waste minimization. Although there have been some steps taken by the core manufacturing sectors towards leaner manufacturing but there is still a wide range of gap which remains un-addressed. The developed countries such as the USA and the European countries have been the front marchers, in the list of the countries in terms of the waste generated by them. The Pacific, Oceania, Middle east and African countries are also not way behind any other in the same context. All these regions having drastically developed as well as developing economies, are more or the less increasing the commercialization of resources, without taking the due steps required to prevent pollution and climate change. The greed and hunger of development has made them to go blind. There are countries who have come up

enthusiastically and started contributing positively towards curbing pollution and preserving the environment to prevent the rapid climate change. The steps taken by these economies such as Germany, Israel, Sweden, Norway, Finland, Singapore, are way too motivating; but the work from these are being depressed out because of no such significant steps from the developing or newly developed nations. There is an alarming call for all such countries as well as the companies operating under them, to identify the root cause contributing towards the wastage of natural resources and creation of unwanted pollution which can be avoided. All the global entities including the United Nations, the World Economic Forum, the World Bank and others are making climate control as their prime agenda and forcing countries to think upon the same and implement measures which can lead to a better and greener ecosystem. The waste being generated in today's era is being termed as the Waste 2.0, by the World Bank.

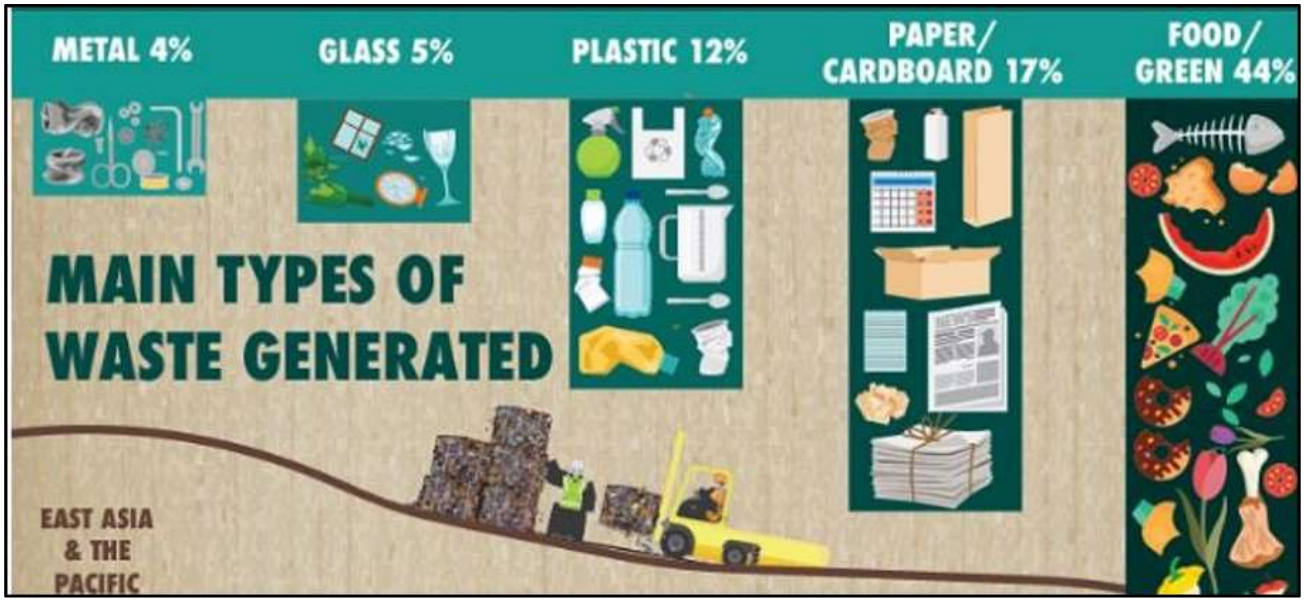

Fig 2.1 Percentage of different wastes
Source: www.worldbank.org

The global institution has laid out a detailed study of how the wastes created from the countries and industries of different portfolios, is going to create an imbalance in the entire eco-chain and what can be its outcome till 2050, if not controlled or stopped. The world Is presently generating 2.01 billion tonnes of solid municipal waste annually, with more than 43% of it being mis-managed and disposed of in an environmentally unsafe manner. This also signifies that the waste generated per person on a daily basis averages to 0.74 Kg, which Is quite a lot. The high-income

countries generate about 34% i.e. 638 Mn Tonnes of the world's waste. The values are really worth thinking and sparing our time, because if they remain un-controlled, then the waste generated may increase by 3.40 billion till 2050 (World Bank, 2019).

Fig 2.2 Waste generation by countries till 2050
Source: www.worldbank.org

As mentioned earlier the high income countries, in specific will be contributing more to the global waste generation and it gradually decreases on a fundamental level when going below the vertical towards low earning countries, this is so because they don't have the required resources yet which can be mis-handled and exploited to increase the unwanted quantity. From the fig 2.1, it is clearly visible that the rapidly developing nations which comprises up of the East Asia and the Pacific-Oceania regions are the highest generators of wastes, that is at 23%, whereas the Middle East and the Sub African regions are at the least, with 6%, but as this region is also developing fast pacedly, presently, so there may be a increase in the same, because most of their waste is dumped in the open till date.

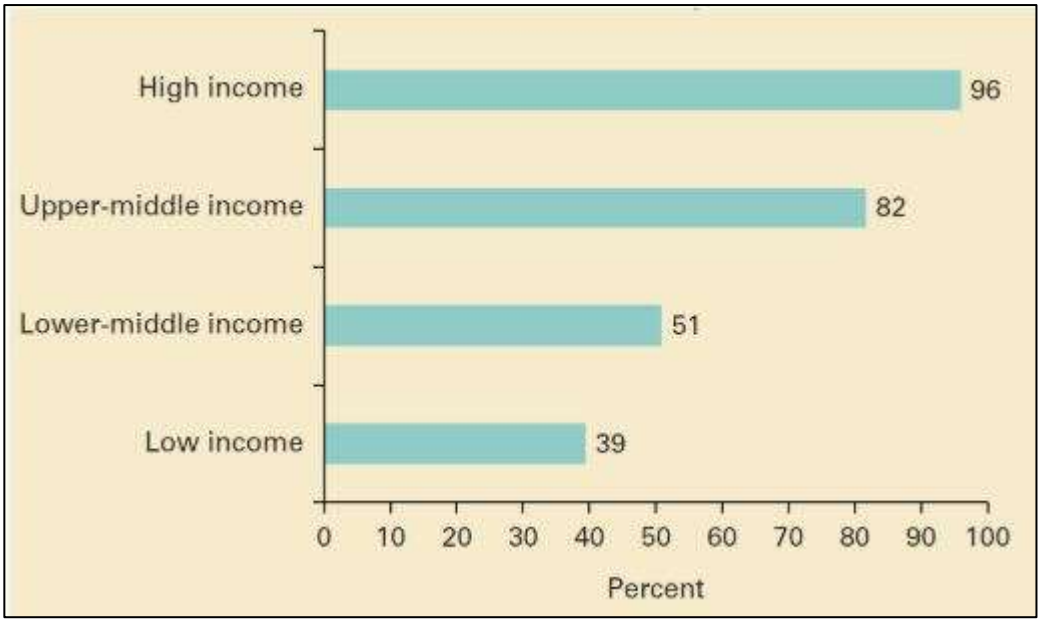

Fig 2.3 Waste generation by countries as per the income
Source: www.worldbank.org

Improper dumping and handling of the same is also contributing to the increasing figures because most the un wanted materials are left to decompose in the open and without any treatment, which takes them un-countable days to get composed up, depending their nature of degradability. If at all the dumping methods are improved it can pave ways reduction in the waste generated, because then a continuous cycle of the entire process can be created which will not lead to the accounting of the unnecessary figures and values.

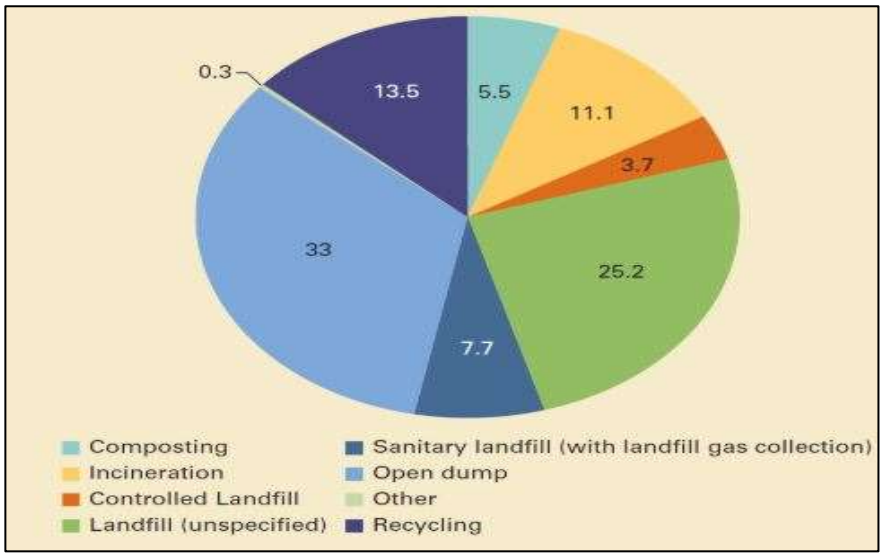

Fig 2.4 Composition Methods by Countries
Source: www.worldbank.org

The waste composition differs in its categories too. From fig 1.2, it is pretty evident that the food and other green wastes comprises up of the highest numbers followed by the dry waste such as paper and cardboard. The high-income countries generate lesser food and green waste rather utters more dry waste such as cardboard, plastic products, paper products, metal and glass. The case with the middle- and low-income countries is simply opposite to this. Their waste generation comprises up of more, green and food related wastes, especially organic wastes. The recyclable waste in these countries are lesser than 20% and thus need more proper dumping processes. It is a misconception that with the rising use of technology the generation of wastage maximizes. But on the other hand, technology is that key which can change the way companies and countries are handling their entire supply chain and operations leading to an efficient waste management processes, thus cutting down their overheads and boosting profitability.

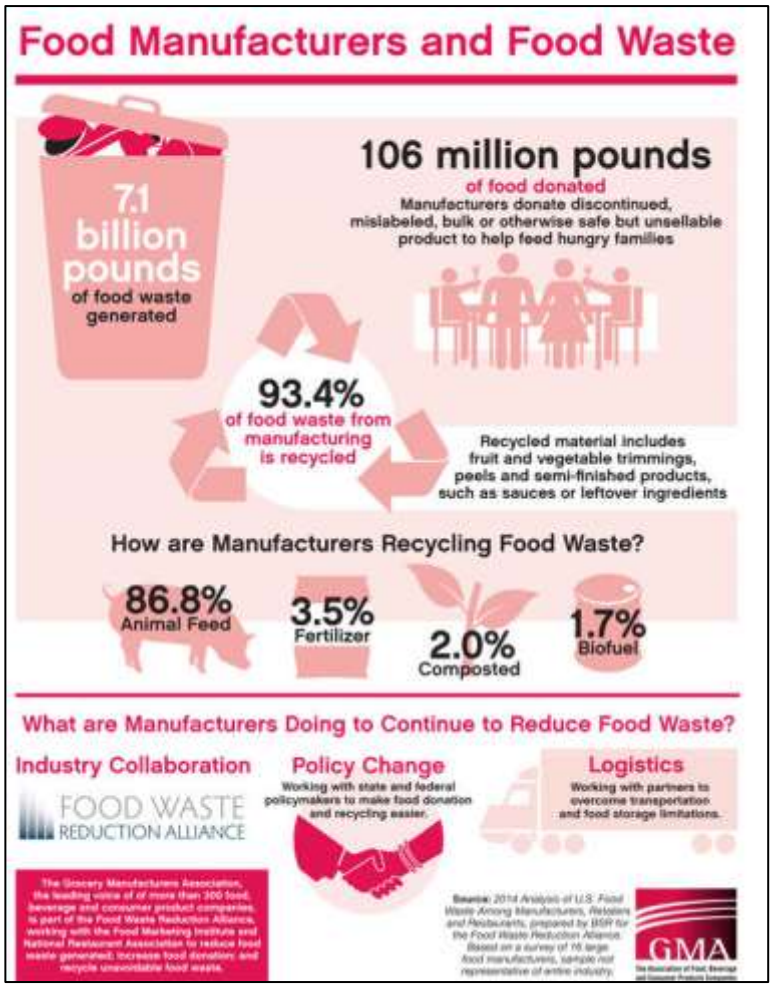

Fig 2.5 Food wastes and management
Source: www.worldeconimcforum.org

The companies have a major role to play with the alarming increase in the global warming. World leader's such as Coca-Cola produced around 3000000 Metric Tonnes (MT) of plastic waste January 2019 till the same of 2020. With the increasing global pressure to enhance sustainable goals and practices, the company for the first time released such data and figures. Along with this, the same report which beared these data has the facts and figures related to several other top companies too and a contrast has been drawn with, what these massively high figures can mean for the environment and the eco system. Nestle also, produced around 1.7 Million MT of plastic alone in 2018 (Ellan McArthur Foundation, 2019). They have also started to take necessary steps to increase the sustainable and environment friendly practices in their production and operation cycle. With this the responsibility of performance is constantly rising upon the shoulders of these mega companies. They have a significant role to play in curbing climate change and disposing global warming, because there are many who look forward to them as ideals and their active participation in doing something positive can motivate others too. The time has come that the biggest of the biggest to the smallest of the smallest organizations in business, must revamp their entire Supply Chain and should shift up to certain sustainable measures and adopt the most astounding concept of Sustainable Supply Chain.

Sustainable Supply Chain refers to the concept of eliminating waste and curbing the carbon footprint induced by them to a minimum level. Induction of sustainability in the supply chain means elimination of all the un-necessary and un-wanted elements from the chain, right from the acquisition of raw materials, to the processing of the goods and till the final distribution of the processed goods till the door of the customer. Inducing sustainability in the supply chain creates a value chain for the company and upgrades the application of lean manufacturing and lean management, to a totally different level. It has not only to do with the substantial benefits of the climate change and greener environment but also with the maximization of profits and curbing up of overhead operational costs, by reducing day to day unwanted and time taking elements which failed to create any value in the entire chain. This very principle has changed the entire dynamics in which the company's used to function. Even the Governments of several countries are acting actively and supporting their organisation and institution to adopt the sustainable development goals (SDGs) with as much efficiency as much is possible. Apart from the environmental issues, Sustainable goals also addresses the issues of wages, health and

safety, of all the stakeholders of the company. This totally influences the long-term economic performance of the company along with its supply chain (Sean Kolenko, 2018). Sustainable supply chain, although, may possess as a very new term, but has a history of long back in the 1980s, when an article first listed in the financial times and later on gained importance in the later 1990s, when the effects of environmental degradation started to come up with the rising pace of globalization. The Supply Chain Council (SCC) was formed in 1996 and this fast forwarded all the industrial and official processes. Further in 2004, the Council of Supply Chain Management was formed after which, the use of sustainable tools was boosted from these organizations and thus bringing them in to a regular practice for the global companies (UK Essays, 2019). The promotion of education and communication of global perspectives were the most important mandates of these councils. This enforces the creation of a business of Sustainability and encompasses all the business partners, including the suppliers, the distributors, the third-party sources and the customers in one integrated value chain. It addresses the social stigmas of the companies too and makes them to focus legitimately upon the Corporate Social Responsibilities (CSR). This indulges in them the ethical elements such as timely payment to the suppliers and distributors and respecting their workers and employees. Failure to inculcate these sorts of goals may lead a big company to fall on to a trap and cause its image to go bad. For example, Nike in 1998, entered in to such a trap because of getting accused of using bonded child labors in their operations. Similarly, toy giant Mattel in 2007 was forced to recall US$100 Million, worth of product when it discovered that one of its suppliers used lead paints on its toys (Sean Kolenko, 2019).

From the justifications above it is pretty much evident that organizations benefit from the sustainable supply chain goal a lot and it has direct relation with waste generation. From fig. 1.2 it is clearly visible that the most amount of waste from the industries are generated in the form of food consumable items and several other dry wastes such as plastic, metal and glass items. A major industry which is behind the production of these stuffs are the FMCG retail industries such as the Unilever, P&G, Marico Industries and retailers such as Walmart, Amazon, Target, Costco, Carrefour, etc. These are the world leader of FMCGs and the retail business. All together they are termed as the FMCG retails (Omkar Palusale Desai, 2018). These companies' despite of being the world leader have one of the highest carbon footprint emission in their entire supply chain, including the logistics right from the acquisition of raw materials till the placement of goods on

the shelves. The activities of logistics from the beginning till end of these FMCG retail industries contribute as much as 22% to the total Industrial Pollution, which is a very major figure. FMCG sector combined up with the Retail businesses, comprises up of more than 40% of all the different types of industries. Thus, this figure is worth noting. Also, the contribution of FMCG retail businesses to climate change and environmental degradation, is pretty major with a contribution percentage to pollution of more than 35% (SCCG, 2020). The packaging application apart from the logistics vertical, is yet another process which involves incurrence of pollution and environmental degradation. The packaging elements contribute around 40% of the global waste generations and hence, it is yet another important part which needs to be addressed. The manufacturing processes undoubtedly is the most critical part of any company's supply chain and thus leads to the waste production as well as pollution at unwanted and dangerous levels. The FMCG Retail companies involve, a lot in the manufacturing processes and lead to carbon emissions (iPoint BiS, 2018). This involves the usage of a lot of amount of energy and natural resources as well as the non-renewable materials such as water. The juice and carbonic acid beverage bottles of PepsiCo, contributed around 60% of the total waste generated by the company. Similar figures of 58% were projected by Procter and Gamble (P&G), too. Unilever too prompted to make its supply chain highly sustainable and make carbon emission null to 0 and stricter its SDGs further (April Streeter, 2016). Indian major such as Dabur India has marched on a sustainable goal of collecting 20000 MT of wastes of plastic and recycle them (Himadri Buch, 2019).

All these reasons were the primary ones for the conduction of the Immersion project on this specific topic related to this very industry. The trend of today is to address the triple bottom line, I.e. Planet, Profit, People; rather than a single one. Thus, all these things invite the implementation of a sustainable supply chain for all the companies.

2.1. PRACTICES INNVOLVED IN A SUSTAINABLE SUPPLY CHAIN:

Talking about the practices involved in a sustainable supply chain, there are a list of activities which have been identified by the experts and made compulsory for implementation so that the concept of sustainability can be enjoyed. Practices involved in a sustainable supply chain have been divided as per the six major types of supply chain and accordingly the steps required for

the efficient operation of each is different. These models are a by-product of the principle of sustainable supply chain (Supply Chain Management, 2019). The six major types of supply chain as divided by the principle of sustainability, are as follows-

a. **THE CONTINUOUS FLOW MODEL-**

This model of sustainable supply chain follows the concept of continuous production to meet up the high demands. This is mostly followed for the businesses with bulky and high demand. Implementing this prevent order miss-outs and losses related to that.

b. **THE FAST CHAIN MODEL-**

The products of shorter life cycle can remain the best fit in this type of model. Businesses which are prone to changing products and produce as per the seasons or the trends of the market fall under this category of working. It is a factor of sustainability as it improves the efficiency of the chain and entails competitive advantage in them.

c. **THE EFFICIENT CHAIN MODEL-**

Ensuring end to end efficiency is the primary goal of this type of sustainable supply chain practice. This makes a business prone to changes and competition so that the customer's favor can be achieved by them, making them ahead of other businesses in the race.

d. **THE CUSTOM CONFIGURED MODEL-**

This model of sustainable supply chain focuses on the elements of providing customizations to customer orders at the time of assemble and production of the product. This is complemented with the concept of sustainability because it facilitates the way of customization in the orders given, so that a level of trust and loyalty is built between the buyer and the seller.

e. **THE AGILE MODEL-**

Certain businesses require production of special orders as per the customer demand. There might be instances in this type of model when there are ample of orders and also when there might cases of no or very less orders. Thus, the business must be of adaptive

nature and be concrete in its operations to deal with the ups and downs. This is the secret behind making such businesses sustainable.

f. THE FLEXIBLE MODEL-

The businesses which are able to control the schedule and amount of their production easily fall under the category of flexible model. These businesses have their model of working pre-defined to adjust the variability in demand and be responsive up to the maximum for the customers. This is a model of sustainability because it increases the product life cycle and also boost up the collaborations in the supply chain.

Above mentioned were the different models of a sustainable supply chain. The techniques involved in implementing the practices of sustainability in any business have been discussed in detail in Chapter-4 of Research Findings under the sub-section of 4.1.3.

CHAPTER:3 RESEARCH METHODLOGY

3.1. PRIMARY RESEARCH-

3.1.1. PROBLEM DEFINITION:

To draw out a cost comparison of the changes in the overall costs incurred after and before the implementation of sustainable measures in the Manufacturing, Logistics and Packaging of CPGs.

3.1.2. RESEARCH DESIGN:

The research objective of receiving the data of cost comparisons between the companies after and before the implementation of the sustainable supply chain goals have been carried out in terms of primary research. The figures and values have been noted down from the detailed focused group interview which had been conducted with the companies via telephonic and online ways of communication. The figures of the data which the respective companies have shared, bear only the data of the last financial year from 1st April, 2019- 31st March, 2020. The problem definition has been tried to be answered in complete by the focused group interviews which were taken. A survey with several close ended questionnaire was not feasible for this type of research. This is so because the problem definition, required data of facts and numerical figures, which cannot be accurately determined by conducting a close-ended questionnaire-based survey. Therefore, the primary research of interview type was conducted instead.

3.2. SECONDARY RESEARCH-

1. The rest of the research objectives have been addressed by the form of exploratory secondary research which involved the gathering of data from the sources such as White papers, Ebsco Journals, Google Scholar paper and other legitimate research sources from authorized and authenticated sources.

2. Books related to Supply Chain Management were also considered for the purpose of data collection of modern techniques of sustainability, which are being followed in the field of FMCG and Retail businesses.

3.3. LIMITATIONS OF THE RESEARCH-

a. The scope of the research on concept of sustainable supply chain management and its implementation in the manufacturing, packaging and logistics of CPG-Retail industries is very vast in itself. Therefore, all the aspects related with the research cannot be researched upon this short span of time. Still the maximum areas on the data could be collected has been fulfilled. The concepts of sustainable supply chain have been discussed in detail in the chapter-4 of Research Findings. Also, the modern techniques which have been used by the CPG-Retail industries in the field of Manufacturing, Logistics and Packaging have also been addressed and discussed in the same. The research objectives identified were tried to be addressed up till the maximum extent possible.

b. The data collected in the form of primary research were done only by the telephonic or online mode of communication. No physical visits to site or the plant of the company was made out to be possible.

c. The impact of COVID-19 was also immense on the research. The primary data collected are only from three companies and are limited to certain figures only, whereas the actual plan was to collect the same in detail and from at least 5 companies or more. The un-foreseen delay in receiving the responses due to lockdowns across several countries which were contacted in the Oceania region as well as the Asian region, restricted the content of the primary research's data to a very few company and country only. Compiling the data would not have been possible on time, if at all more time would have been spared against waiting for the responses from the contacted companies.

CHAPTER-4 RESEARCH FINDINGS

4.1. RESEARCH OBJECTIVE-1:

To study about the concept of Sustainable Supply Chain management and to research upon the emerging and innovative techniques and methods which companies can inculcate in their regular supply chain and operations to promote sustainability in terms of reduction of carbon footprint and other sustainability factors

4.1.1. CONCEPT BEHIND SUSTAINABLE SUPPLY CHAIN MANAGEMENT

As mentioned in the literature review, the Supply Chain Council (SCC) formed in 1996 was the prime force behind the coining of the term of a sustainable supply chain. The prime idea behind this was developed after the segregation of supply chain from operations. Earlier the processes involved in a any organisation was broadly divided in to Accounting, Sales/Purchase, Operations, Production and Dispatch. Later on, after the end of the Second World War, with the adoption of Liberation, Privatisation and Globalisation (LPG), the exchange of trade in between the super powers of the world, namely the USA, China, the USSR and the Europe increased rapidly. The USA imported around 57% of goods from China by the end of 1980s. With the surge in trade exchanges the complexities of the business also increased rapidly and led to the serious issues of mis-management. Suppliers were required to be dealt separately and their needs were also required to be fulfilled fully. Similarly, the issues of procurement and inventory piling too started to affect the regular operations of the organisations. With the growth in all of these, the organisations were deferred to find a solution regarding this issue. The discussions among the Industrial Federations all across the United States of America sat and came up with an agenda to discuss this matter on an international level and so, the major countries of the world came up to a conclusion that the term Supply Chain, which was first introduced by a management consultant named Keith Oliver in 1982; must be inculcated in the regular use by fragmenting the components from the earlier domains of Accounts, Sales, Operations, Production as well as Dispatch. Here on the term of Supply Chain started gaining popularity and made the organisations to diversify their working processes to achieve better results. Segregating the procurement, flow of materials, supplier-buyer relationship management, processing of goods,

warehousing and storage activities, and lastly the delivery till the end customers, under the banner of supply chain has smoothen up the flow of processes and identified several areas of key improvement for the companies. Supply Chain Management has become a very critical part of the organisations nowadays. With rise in criticality the rise in identification of loopholes in the chain too have been on a rise. It has been witnessed that the supply chain of any company contributes to as much as 38% and more of the total waste generation in industries despite of the nature of their business. Poorly managed supply chains impact the profitability of the organisations too by a very vast margin. It directly impacts the operational margin and increases the operational cost of the company by increasing the costs involved behind the plant, production and equipment. Also, the Cost of Goods Sold (COGS), starts increasing which decrease the Gross profit of a company. Therefore, the entire Net Income goes down in this way. Further dealing with the uncertainty in supplies as well as conflicts between the supplier and buyers too possesses a problem. The logistics in itself is a major source of waste emissions and a contributor of greenhouse gases. Therefore, there are several problems which require an addressal in the segment of supply chain management. The single answer for tackling all these issues is called as Sustainable Supply Chain Management.

4.1.2. DEFINING SUSTAINABLE SUPPLY CHAIN MANAGEMENT

Sustainable supply chain is the concept of differentiating and modifying the conventional supply chain activities by usage of smart steps which can contribute profoundly to the reduction in wastage and harmful emissions.

4.1.2.1. FROM THE ECOLOGICAL POINT OF VIEW-

Industries are the major source of harmful emissions and waste generation. So, they should be considered responsible for the rapidly changing climate and increase in the evil of Global Warming. Therefore, it is the industrial sector which needs to carry the responsibility of reducing and control this as well and they have started taking this aspect very seriously because there is no other option left apart from curbing the harm. The concept of sustainable supply chain has this as its foremost motive. This means that there should be least generation of carbon footprint from the activities of process flows going on in an organisation and the workings must contribute positively to the environment in the coming years. There should not be any degradation of the environment because of the industrial activities which are being carried out. There should be a

complete check involved upon all the activities in the manufacturing, production, and the distribution processes of the organisation, to chalk out the possible sources of waste and harmful releases which are toxic in nature. The decomposition of the same must be done very efficiently and technically so as to avoid any ill effects in the future.

4.1.2.2. FROM THE NON-VALUE-ADDED ACTIVITIES POINT OF VIEW-

The meaning of sustainability does not end here itself. Along with the required steps taken for reduction in harmful emissions and generation of waste from the operational flows, it is essential for an organisation to get equipped with smart practices at workplace and include the related steps for becoming fit for the definition of being called as sustainable. Reduction of activities and processes which can be termed as non-value-added activities must be identified and eliminated from the entire supply chain. For this particular purpose, usage of the tools of lean management as well as lean manufacturing will be required in the future. The tools such as Value stream mapping, Jidoka, the Ishikawa Diagram, Root Cause Analysis, the A-3 rule and many more can be used by the organisations to get a list of the several non-value-added happenings. Such activities must not only be identified from the area of manufacturing but from the other critical parts of the supply chain as well; such as from the procurement process, the inventory storage as well as from the distribution process. Hence, going lean is another step which must be taken in to consideration.

4.1.2.3. FROM THE FINANCIAL POINT OF VIEW-

The impact of the non-value-adding processes damage the financial condition of the company like a slow poison. It will not be reflected upon at the very beginning of any such un-wanted instances, but steadily it will take shape and start raising the bar of expenditures from the gross profit itself. Certain unwanted additions in the supply chain like operating the businesses which are no more profitable, increases the depreciable amount for the company which leads to an increase in the Earnings Before Income, Tax, Depreciation and Amortisation (EBITDA) margin of the company, which must be kept moderately low in order to boost the Net Income or the Profit After Tax. Further, such types of activities and businesses increases the tax slab for the company due to several types of financial bounding, which further enhances the Earnings Before Taxes (EBT) and affects the PAT, too. This also makes the company to pay more Income Tax along-with other unavoidable taxes for services being utilised and complicates the financials.

4.1.2.4. FROM THE DISRUPTIONS POINT OF VIEW-

Technical disruption and uncertainties in business are its peak presently. With growing innovations and freely flowing creative ideas in the business market technologies which were in the last five to ten years, considered to be advanced are now becoming obsolete within a blink of eye. For example, IBM's Watson, which was considered as the most efficient AI based platform for data analytics, is now no more in to use and is being replaced by platform of SAS-JMP and many others. Similarly, in the present scenario of the COVID-19 pandemic, the role of supply chains has been very critical for the businesses of different types and proved out to be challenging as well. All the advanced systems and technologies have been challenged immensely to cope up with this. The ones who had planned their supply chain strategically have survived, while rest others have got perished under the destruction poised by the stopping up of supplies and trade. Therefore, a sustainable supply chain has the capability of surviving in this type of natural calamities as well. For example, Walmart had perfectly forecasted from the outbreak in China, in February, itself the that there will be a sudden rise in demand as soon as the Corona virus will spread across the countries and measures of lockdown will be taken up. So, it had stocked up its store across the globe with sufficient supplies and thus, is operating presently without any stockouts. These are moments of mass destruction and hence, cause mass disruptions as well. A sustainable supply chain entails in the principles of constant review of their entire working from time to time, so that the ways for avoiding the uninvited uncertainties can be enlisted. Moreover, the principle of sustainability pushes a business for constant improvement and advancement as per the latest trends of the market. Digitalisation and technical advancements are also a part of this. This is how sustainable supply chain prevents business from disruptions as well.

So, it can be well inferred from the above discussion that integration of ecological balance with lean tools are an essential ingredient for bringing in the flavour of sustainability in not only the core technical part but also in the Financial part of the organisation, which will lead to Profit Maximisation in the future and defend the same in case of any situation of uncertainty, as well. Making the supply chain greener and leaner sustains the business healthily for the years to come and thus, defines Sustainable Supply Chain Management accurately.

4.1.3. TECHNIQUES FOR SUSTAINABLE SUPPLY CHAIN MANAGEMENT

By now it is pretty much clear that what is the concept behind sustainable supply chain management and the importance which it has, specifically in today's time when the environmental degradation and technological disruption are at its peak. So, this is making the organisations attentive towards the principles of sustainability. The steps involved in the sustainable supply chain management are as follows:

a. **Mapping the Current State of Supply Chain-**

This is the preliminary step which is highly essential. As discussed under section 4.1.2.2, mapping of non-value-added activities is a must be done by laying out a current state map of the processes going on in the business. The suppliers as well as the managers must come in unison and all together map out the particular supply chain pipeline to evaluate the operational process flows perfectly. This must include evaluation of third-party collaborators, vendors and workings with other organisations, to pinpoint the sources of wastes and in efficiency (Nick Ostdick, 2016).

b. **Setting Up Realistic Goals-**

The expectations and goals set by the organisation on their employees as well as on the other stakeholders must not over ambitious. The organisation must understand that sustainable practices and the goals set in the business for them should not always be for the purpose of gaining competitive advantage. Once the mapping of the chain has been done, then the managers and executioners can sit together and discuss the supply chain benchmark which they want to achieve and accordingly allocate the responsibilities to the other employees inside the supply pipeline.

c. **Developing A Baseline or KPI Based Metrics-**

Higher Returns on Investments (ROI) on sustainable measures adopted can be ensured once the regular monitoring of the inhouse designed performance-based metrics is done. Simple surveys, questionnaire, focussed group interviews and other types of feedbacks are essential for monitoring and analysing the impact of sustainable practices involved in the processes and whether any value creation is being achieved because of this or not.

Sharing and discussing these metrics with the team members will entail a feeling of ownership among the supply stream pipeline.

d. Spreading Education and Knowledge to Partners-

The stakeholders of the organisation must be made to understand and feel that associating with the business will benefit them in the long run and an adjacently continuous growth will be perceived for them too, with the same of the business. Continuously training them and sharing with them different knowledge centres will undoubtedly make them more loyal and attached with the organisation and also improve their performance. They will get a hint of what is happening in the global market presently and can perform accordingly as per the trend. This will help to last longer in the race of supplier business's and function with confidence.

e. Identifying the Most-Costly Spending Area-

The area for which the highest spend is being done must be identified. This will help in analysing the productivity out of the area against which the highest amount of payment is being offered. If at all no desired output is being extracted out of that, then that extra cost must be curbed.

f. Defining The GREEN-

This is the heart of sustainable supply chain. Defining green not only means that there is a need to look after the environment, but in today's world the definition has changed to attaining economic prosperity, environmental quality and giving social justice (Kin McQuilkin, 2018). Along with this the organisation also needs figure out how the concepts of lean can be implemented in the organisation. It should be made clear whether it is to be done in the area of manufacturing the product, or the transportation of the product or whether it is chemical free or not. These can be benchmarked by third party audit agencies and ratings by them.

g. Analysing Back-Haul Analysis-

One of the major issues in the transportation network is the returning of empty trucks with no load in them. This creates no value rather contributes to the pollution as well.

Also, it causes a loss to the company in terms of money paid for the return trip. The strategies to equip these empty trucks with load must be designed. If at all no possible step is possible then third party vendors must be contracted with who can help in the back-haul process.

h. Doing an Analysis of The Warehouse Design Efficiency-

Warehousing is a very important process of supply chain. Numerous activities are involved in the same and efficiency as well as responsiveness both are required to make a warehouse activity efficient. Required profiling must be done as per the order or the customers to eliminate any source of in efficiency. The processes of picking, put away, distribution and packaging must be made automated and the verification as well as the documentation processes must be digitalised in order to save time and respond quickly for the order fulfilments.

i. Going Beyond Compliance Management-

Simply following the scheduled loop of rectifying the compliances each time it occurs is not sufficient. Rather than this complete rectification of the source of the compliance or the process in total must be done to ensure that no such compliances arises in the future and is completely reduced to nil.

j. Following the Concept of Involvement Procurement-

This is a modern-day principle which is followed to curb the harmful emission and contribute affectively towards the environment. Along with the consideration of price and quality the environmental benefit or the impacts must also be considered by both the partners of trade. For example, the suppliers must be asked about the recyclability of the product and the statistics of the energy used behind making the product or what are the steps which they take to reduce environmental degradation.

k. Inducing Circular Economy-

The concept of circular economy is like the heart of a sustainable supply chain. Products procured, manufactured or distributed and the means for doing so must be such that recycling and reusing of the same is made possible. This will keep the same product in

circulation, by extending its life and will also preserve the over usage of resources required to procure, produce and distribute the same. This element improves the sustainability of the products and hence, of the business if implemented perfectly.

l. **Monitoring Total Life-Cycle Cost-**

Implementing the principles of lean and sustainable measure might end up increasing the cost of the overall product life cycle as compared to the conventional processes pursued. There is a strict need to foresee these costs on a regular interval. Not only the purchase price of the product must be looked upon but also the cost of ownership behind that which involves the elements pf land, energy water, human labour required for cleaning, maintaining, operating and disposing the item must also be looked upon. All these contribute to the total life cycle cost of any business.

m. **Constant Review and Healthy Discussions-**

Just implementing the steps of sustainability at once is not enough for achieving the benefits but keeping a regular check on the progress is most important. The planners of the supply chain and the managers must be at vigil every time in order to ensure that the sustainable activities are up to the benchmark or not. This will ensure end to end visibility and transparency will be benchmarked.

4.2. RESEARCH OBJECTIVE-2:

To study the sustainable activities involved by Retailers and sellers of CPG products, in their supply chain for improvement of performance and sustainability and to focus on, how the concepts of Circular economy can be bought in to use in the area of its packaging, manufacturing and logistics of CPG Retail industries.

It is pretty much clear from the Section 1.2 and the discussions in Chapter-2, that FMCG and Retail industries contribute to more than 61% of the total waste generated, in the form of food, green and dry waste. Also, it is evident from the section 1.3.4, that the packaging wastes consists up of more than 146 Mn Tonnes of and the furthermore the manufacturing and logistics activities all together utter more than 58% (36% and 22% respectively) of the total emissions. Therefore, there is no doubt against the fact why Manufacturing, Logistics, and Packaging operations of CPG-Retail industries have been chosen as the research objective. The FMCG and Retail industries being a stalwart in the business world have started accepting their roles and responsibilities towards the environment. There are many big names from the fast-moving consumer goods who are the undisputed leaders of the industrial sector all across the globe and so, it becomes important for them to march ahead as leader in taking certain steps which can be considered as benchmarks and be standardised for future. The adoption of several Sustainable Development Goals (SDGs) at the global level, by these companies have raised the bar of confidence in the customers as well as the investors who are on-board as the stakeholders of the same or are willing to be one amongst them.

The steps taken by the CPG-Retail organisations in the field of the implementation of sustainability are really worth noting as well as applauding. The innovative steps taken by the companies are discussed in detail in the section-4.2.1. Each and every one of them is very much innovative from the perspective of the environmental and economical perspective.

4.2.1. KEY SUSTAINABLE STEPS TAKEN BY INDUSTRIES OF FMCG-RETAIL

4.2.1.1. TOWARDS THE PROCESS OF MANUFACTURING-

a. **Product Stewardship** is a very innovative tool which is being followed by the companies in their design phase to eliminate the pinpoints of waste generation. It restructures the way the producers design their product, so that its life cycle can be extended. It may involve the processes of Early Supplier involvement, and alter the product design at the R&D stage so that the manufacturing capacities are well modified as per that. Here the manufacturing facilities are made to work for the required period of hours as per the demand generated and hence the resources are preserved for the next production cycle and not wasted. Here a limited amount of resources can be used for multiple production cycles. Product Stewardship involves designing the product in such a manner that it can be recycled 100%, after its age is over. This involves the principle of giving the product a rebirth once its life cycle ends rather than disposing the same which makes it a "cradle to cradle" technique rather than a "cradle to grave" one (Marc Rogoff, 2018). Product Stewardship brings in the manufacturer, the retailer, the distributor as well as the local government under one chain and thus integrates them, which is a major goal for attaining sustainability.

   Companies adopting the technique- Marico-SEA region, Nestle-APAC for products of Nespresso.

b. **Environmentally Preferable Purchasing (EPP),** is a type of principle of sustainability involved by several FMCG companies, which involves the practice of re-using or removing the ecologically harmful extracts or the by-products released, back in to the manufacturing or the production processes. HUL-Oceania region began this initiative in the sector of FMCG industries. A toxic gelatinous chemical which was released as a by-product of chemical reactions for bringing in a shining property in the shampoos and the same when released in water caused fatality of marine organisms. This was replaced by certain organic extracts of flowers and plants and this is how HUL standardised the same

across all of it factories and adopted an innovative sustainable technique. Indian major ITC too uses this technique as a standard for manufacturing products involving tobacco.

c. Implementation of **Supplier Sustainability Index (SSI)** has been implemented by several manufacturing units of the FMCG majors across the globe. SSI is a type of metric grading system in which the manufacturer rates its supplier on the basis of the certain critical factors which are very much important for the successful relationship management and exchange of trade to carry forward. The most important factor of rating in this index is to chalk out factors related to the environmental friendliness of the product and the procedure used to manufacture it. If at all no emissions or harmful releases in terms of solid, liquid or gaseous wastes are released in the atmosphere, then the SSI ratings is the highest for that type of product, despite of the fact that it might have certain lesser features as compared to the same product of different suppliers. Following the SSI, shows that the importance of sustainability is a major goal of the company. On the basis of the ratings in the SSI, the company categorises its suppliers and even helps them further to improve in the key areas which where they received lesser ratings. This is how a comprehensive growth of the business will take place by integrating the suppliers in the business's ecosystem and ensure long term relationship. Moreover, the suppliers need to be responsive as well to attain a good rating in this index. They must follow the concepts of elan and then accordingly respond to the demands raised from the producer and meet them on time so as to avoid the large inventory at the producer's sight. This is another step in the promotion of sustainability. Receiving lesser ratings does not mean that the supplier will be totally eliminated from the list buyers of the company rather would be trained or suggested in ways and methods to improve the areas of weaknesses to bring in the competitiveness.

Companies adopting the technique- P&G initiated the concept of SSI in the manufacturing sector in the European and Asian region at the beginning and later on after getting a holistic success from that implemented it in its global operations. Now, HUL, L'Oréal, Danone and many other giants are also following SSI.

d. **Minimalistic Resource Framework (MRF)** is being followed up by the mega packaged consumer goods Retailers. This framework relates to the concept of manufacturing the

product in such a way that the least amount of resources is used up in making the same. Resources refers to the natural sources such as water, air, energy, chemical/naturally extracted compounds, as well as the man-made resources such as Human resources, machines and tooling equipment. This may require the companies to completely alter the product specifications, the product design or the manufacturing facility. It may end up being costly for the already existing organisations initially but proves out feasible and profitable in the long run as it minimises the over usage of resources and reduces them by a very large margin thus preserving the extra costs involved behind the same, whereas the new setups might include this framework right from the beginning itself. Hindustan Unilever (HUL), implemented this framework in its manufacturing facility in China and Australia, as an experimental initiative by reducing the resources involved in its personal care products, like for the making up of Close-Up toothpaste the company eliminated the use of calcium compounds from the ingredient of the paste by replacing it from the edible compounds extracted from the left over by dairy products from its another product line called as Kwality Wall's ice cream. In this manner the wastage of one product line was used as a compound for another product and hence, the elimination of chemical compounds was done and no resources were wasted in the manufacturing of the chemical compounds which involved complex chemical reactions using labour, energy and water in larger quantities. This saved HUL around 50 Million US-Dollars, on the annual basis, which is quite a large amount (Peter Dreher, 2018). Following the same framework, P&G increased the concentration of its Tide detergent and reduction of the pack size.

e. **Life Cycle Assessment (LCA),** refers to the methodology of analysing a product in terms of its environmental impact and the resources consumed by it. An eco-profile based upon the emissions and pollutants released by the company is created and a rating is given by external third-party audit companies to them, annually. Each year the audit is performed and the ratings along with the suggestions of improvement is given to the company. Based on the suggestions given earlier, steps of improvement and modifications are taken to improve the quality of the product with the required steps of environmental upgradation and resource preservation which promotes it on the eco profile created.

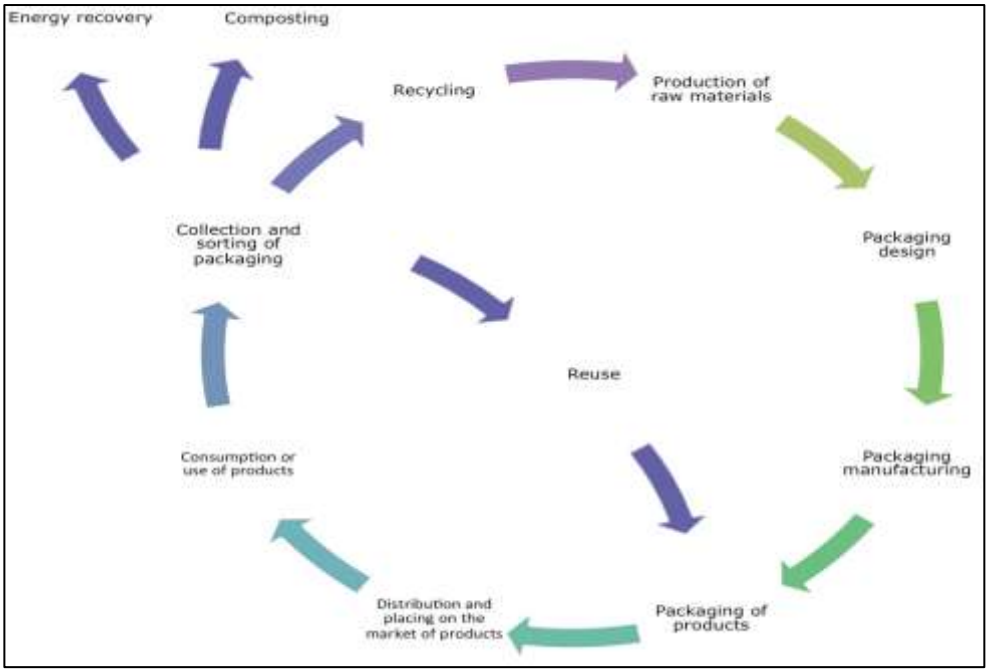

Fig 4.1 Life Cycle Assessment of plastic package at P&G
SOURCE: www.formlabs.com

The next audit is done to check whether the same have been improved or not and by how many days is the life cycle of the product increased. This cycle is repeated till the time the product achieves the maximum life it can. In this manner it reaches the top level of the eco profile created. Nestle follows LCA and is on the second level of the eco-profile and ITC-India, is on the third rank in the profile.

4.2.1.2. TOWARDS THE PROCESS OF PACKAGING-

a. Implementation of the **Extended Producer's Responsibility (EPR)** have been done by several FMCG majors. This is a very effective tool of sustainable supply chain management, which revolves around the concept of taking the ownership of the packaging process. The principle when followed transfers the ownership of packaging and its waste management from third party vendors or local agencies to the producer company itself (Marc Rogoff, 2018). It deals with the benefits of the preferred approach policy followed for the end of life management for packaging and printing paper. This principle requires the producers to change the design of their current packaging and revamp the technique or the structure of the packaging material, so that the recyclability can be increased as well as the use of packaging materials can be reduced. Furthermore,

the EPR brings in the benefits of higher recycling rates as well and also provides up with additional funds from the local government in terms of subsidies for promoting environmental upgradation. It restructures payment procedures as well because in this the consumers need to pay for their own waste generation rather than the regular tax payers. Thus, implementing EPR reduces the overall cost of the product for the producer as well as the consumer by enhancing its recyclable efficiency.

Companies adopting the technique- Procter and Gamble (P&G) Singapore/Australia, Walmart-India, Dabur-India, Nestle-Southeast Asian Region.

b. Product Stewardship, as explained under the sub-section 4.2.1.2, is also being used to make the packaging products attain complete life cycle retrieval and never get depleted up which means it can be recycled for unlimited number of cycles and can be used for one or another purpose.

c. Companies have implemented several techniques for achieving the complete recyclability of its packaging and storage by-products which are rejected once the parcel is opened or the product is emptied up. The concept of recycling education is being followed nowadays. In this, grants are provided from the municipal corporations to the companies who bring up and dump the recyclable waste to the respective company to whom the same belongs to. Coca-Cola, has initiated this step of environment upgradation. Meanwhile, Pepsi-Co has planted machines by the name of **Dream Machine** has been planted all across the residential areas of China and Hong Kong, for the collection of the containers or bottles of tins, plastics, cardboard, etc. People can contribute their part by dumping the wastes in those machines, which will be later used by the company for the purpose of recycling.

d. **Collaborations** in the field of supply chain has been done and initiatives have been taken all together to reduce the wastage and its ill impact on the society. These collaborations work together as partners and chalk out the areas which can be improved to bring in the element of environmental upgradation as well as economic prosperity by cutting down the value less properties in the supply chain. Packaging apart from its importance, is nowadays being termed as majorly value less because of their single use throw away

system. So, companies are finding out ways to minimise the packaging to the minimum, or else if not feasible then make the same applicable for multiple usage. Large scale producers have even partnered with several start-ups, Universities and technical colleges for innovation in the field of packaging. Walmart in partnership with P&G has asked its mega supplier to completely reduce down the packaging of the cartons received and the products inside them, so that least wastage is created and resources for making them, are also preserved. The products which cannot manage to minimise the packaging due to their nature, must make the same multi usable like the packaging material for the Head and Shoulders shampoo have been made so that once the box carrying the lot of the shampoos are dropped at Walmart's facility they are reopened and returned back to P&G where they are used for the other lot of the products of similar dimension. This is how the packaging materials are being reused multiple times at multiple locations and not thrown away, thus conserving wastage.

e. Advanced material sciences have been used to improve the quality of the materials which are being used for the packaging purposes. Usually packaging materials consists up of materials such as Plastics of single use which are made up of Vinyl, Polyethylene terephthalate (PET), Polystyrene and other conventional materials such as Glass, metals and many more. Usually these are non-biodegradable materials. Therefore, for this purpose the principle of advanced material sciences is being implied and used extensively to research upon the advanced materials which can replace the single use plastics and other non-biodegradable materials. The industries have managed to identify many such advanced materials which can be bought to use with the principles of sustainability involved in it. Marico has started using an advanced material called as Fibre Form for the packaging boxes of its diversified range of products line. This advanced material is totally biodegradable and produced from the pulp of timber and it's remains. It is entirely degradable and very cheap to produce which saves a lot of cost from the operational overheads of the company. Other materials such as Marina Tex made form the marine wastes, Bagasse extracted from the sugarcane waste, Mycellia made from the outer shell of the mushroom, are some of the other modern and entirely bio degradable materials which the companies are using in the field of CPG and Retail for reducing wastage by packaging.

f. **Corrugated Box Designs** is the principle which is being followed by the companies to pack the products. In this a fibre board box is used to pack the goods of smaller sizes and which can have multiple operational benefits as well. Packaging engineers end up optimising the box to suit the transportation of the goods.

4.2.1.3. TOWARDS THE PROCESS OF LOGISTICS-

a. Reduction in emission has been the prime goal of FMCG majors for the process of logistics in their supply chain. FMCG-Retail companies involve ordering of various consignments of different sizes and in different quantities and that too in regular intervals of time. Thereby the emission created from transporting a particular consignment outnumbers the value of the goods in it. So, the companies are designing the locations of their manufacturing facility, storage facility and distribution facility in such a way that the total miles travelled by the vehicles of logistics is reduced. This not only curbs pollution but also saves a lot of cost in terms of the fuel used. Strategic locations for all the facilities are identified and accordingly the goods are transported to them. If the mile reduction is not being possible then certain areas for identifying the transit points or cross dock ports can be identified for the purpose of efficient distribution. Companies such as Nestle, Walmart and many more follows the principle of cross docking to make logistics efficient. Apart from these electric vehicles and battery-operated modes are also used in shorter distances to avoid any emission due to fuels.

b. **Low Truck Load (LTL)** methods are being followed in the field of logistics to curb the carbon footprint (Adam Robins, 2020). In this the load given on the shipment carrier is less than that of the capacity of the vehicle. This increases the mileage of the transportation vehicle and reduces the cost of the fuel. Thus, overheads on the fuels are also conserved. In this method the shipments are packed in to one, rather than keeping multiple smaller shipments in the container. This improves the handling preventing pilferage of the package as well and multiple similar packages can be combined in to one unit and be loaded along with. Unilever was the first company to adopt this method for logistics across China.

c. Advanced technological tools such as **Blockchain and AI** is being used to enhance the element of sustainability in the logistics. Implementing bock chain enhances transparency of the goods flow, for the customers as well as the producers. Proper tracking can be ensured and this is yet another important factor of creating sustainability in the business. Supply chain transparency improves the trust among the stakeholders and bind them in one chain integrally. Walmart uses blockchain based tracking and tracing system and connects the same with its supplier P&G by a technique called as Retail Link, by which P&G can get the real time data about the product quantity on the shelves of Walmart and supply the depleted products.

d. Usage of a Transportation Management System (TMS) is being used to improve the flexibility and scalability of the logistics systems. There can be instances of immense variability in the demand. This can be addressed by an efficient TMS where based upon the historical data predictions and permutations of the demand can be made and released. This helps in keeping the customers in constant loop and send them the correct communication about their order. 7-11 in Japan, began the usage of TMS in the beginning and later on carried it further till Australia and South East Asian countries as well. The TMS here updates the customer about the order when it is on the way of reaching the store, a day before.

e. Transportation Run based upon metrics are being used, by integrating them with the ERP or the TMS. By doing this the entire transportation footprint can be seen instantly and the scopes of regular improvements can be found out. It is a KPI type of metric run system which improve quality and reduce costs from the logistics.

Therefore, it clear from the above discussions that, desired work is being done by the CPG majors and innovative techniques have been identified by them to inculcate the sustainability in their manufacturing, packaging and logistics operations.

4.3. RESEARCH OBJECTIVE-3:

To find out about the Supply Chain collaborations for promotion of sustainability in CPG-Retail sector.

Unique collaborations can be seen in the field of FMCG-Retail sector, to promote the essence of sustainability in the community as well as the company. These collaborations can be rising start-ups, Universities and Technical colleges, as well.

4.3.1. SUPPLY CHAIN COLLABORATIONS FOR PROMOTION OF SUSTAINABILITY-

a. NESTLE-APAC REGION WITH INSTITUTE OF MARINE RESOURCES AND ECOSYSTEMS (IMARES):

Nestle in collaboration with IMARES have laid down Ecological Quality Objectives (EcoQO) since 2017, which deals with amount of wastes released in the water and the dangers posing by them to the marine life. Guidelines as per EcoQO prevents the release of waste of any sort in the marine route, as well as keeps a check on the carbon footprint from the transportation done by the sea's routes, specifically for Nestle. The data related to the waste emission and carbon generation as analysed by IMARES is then analysed by Nestle to remove and sorts out the sources of such generations. Nestle has been able to cut down their marine carbon footprint by 81%, since the collaboration and has seen a positive impact on its profitability by an increase of 21% in the profit margin (Christopher Crawford & Brian Quinn, 2018).

b. WALMART-GLOBAL WITH COMMISSION FOR THE CONSERVATION OF ANTARTIC MARINE RESOURCES (CCAMLR):

Walmart collaborated with CCAMLR for its global operations as a part of its CSR activity. The main role of this collaboration is also to identify the amount of wastes released in the marine bodies by the companies all across the globe.

Walmart keeps a check on its suppliers as well as distributors by the medium of data collected from CCAMLR. Walmart maintains a record of the monthly emissions and carbon generation by its suppliers/distributors during the exchange of business with it via the sea-route of transportation. Walmart has also set a benchmark for them to work under it. Whosoever crosses the same is asked to give an explanation for the compliance and improve it further in the next month (Tony Walker,2019).

c. ITC-INDIA WITH THE GREEN TABLE (TGT):

Indian FMCG major ITC has partnered with a Delhi-NCR based start-up called as The Green Table, for innovating the packaging materials used for its diverse range of products. TGT provided packaging and wrapping solutions to ITC and is helping the company in eliminating plastics packaging from its supply chain and replacing it with the organic packing materials derived out of agricultural wastes such as sugarcane, wheat/paddy extracts. Bagasse an extract from the waste sugarcane after its processing in the sugar mill is being used to make the boxes of products of tobacco for which the company is a major seller across the globe.

d. FUTURE RETAILS WITH MARICO:

Indian retail giant Future Retails' superstore Big Bazar has partnered with its supplier Marico to launch a movement to promote the increase of plastics recyclability. The movement is called as "Plastic Lao Paise Kamao" in Hindi which translates to Bring plastic and earn money. This movement allows customers to bring in and deposit plastic items across the stores of Big Bazar in India and earn money against it. For each bottle submitted ₹10 is given to the consumer in the wallet which can be encashed later on against any purchase.

e. HINDUSTAN UNILEVER (HUL) WITH UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP):

HUL has partnered with UNDP to promote Plastic Waste Management (PWM). Plastic recyclability and creation of a circular economy is the prime focus of this group. They work to ensure how the products being made by HUL can be extended in terms of reusability and recyclability and remain in the supply cycle for longer course of time.

f. PARLE AGRO WITH PACKAGING ASSOCIATION FOR CLEAN ENVIRONMENT (PACE) AND ACTION ALLIANCE FOR RECYCLING BEVERAGE CARTONS (AARC):

Another Indian FMCG giant Parle Agro collaborated with PACE and AARC to redefine the way it is packaging and distributing its products. They have all together designed the concept of Zero-Base Packaging Concept. The company is working on non-plastic based packaging materials for its edible products so that no reaction of the same happens with food in the packet and plastic can totally be eliminated from its supply chain. This is how the company plans to accelerate the movement of sustainability and remove plastic from its chain.

4.4. RESEARCH OBJECTIVE-4:

To draw out a cost comparison of the changes in the overall costs incurred after and before the implementation of sustainable measures in the Manufacturing, Logistics and Packaging of FMCGs.

Implementation of sustainable activities affects the operational cost of the organisation. Although sustainable supply chain means there will an increase in the overall profitability of the company but there might be different effects of this on the industries depending upon the scale of the business and also the nature of the same.

4.4.1. COST COMPARISONS AFTER AND BEFORE THE IMPLEMENTATION OF SUSTAINABLE MEASURES-

The primary research done for the purpose of this research involves the collection of data after an in-depth interview with the organisations who have undertaken certain measures for the betterment of the environment and have initiated steps for

adopting Sustainable measures in their supply chain. The data from the industries have been collected by choosing an industry each from the Small, Medium and Large Enterprises, so that a proper variation in the cost of sustainable measures can be observed from each.

4.4.1.1. DABUR INDIA PVT LTD, INDIA-

SIZE OF THE COMPANY	LARGE
INVESTMENT IN SUSTAINABLE PRACTICES	39.26 Mn USD

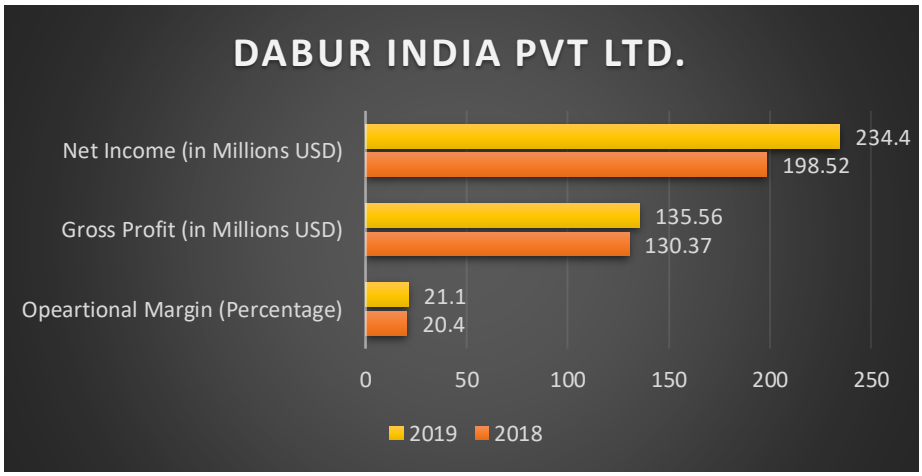

Fig:4.2 Financial Data Analysis of Dabur India
SOURCE: Primary Research

It can be analysed from fig 4.2, that Dabur India which is a large-scale company invested $39.26 Mn in 2017 and henceforth have seen an appreciable increase in the financial data. The success of sustainable practices implemented by the management has increased the Operating margin of the company by 0.7% from 2018 to 2019. Further the Gross profit of the same has gone up by approximately 4%, which is a decent gain. Because of a significant increase in these factors, the Net Income of the company has boosted up by approximately 18%. This reflects the fact that implementing sustainable practices in the supply chain leads to the overall development of an organisation. Being a company of Large scale, it has enjoyed immense profits against the investment for sustainable initiatives and has been able to make a lean and green environment for fulfilling its customers.

4.1.1.2. JYOTHY LABS LTD, INDIA-

SIZE OF THE COMPANY	MEDIUM
INVESTMENT IN SUSTAINABLE PRACTICES	15.93 Mn USD

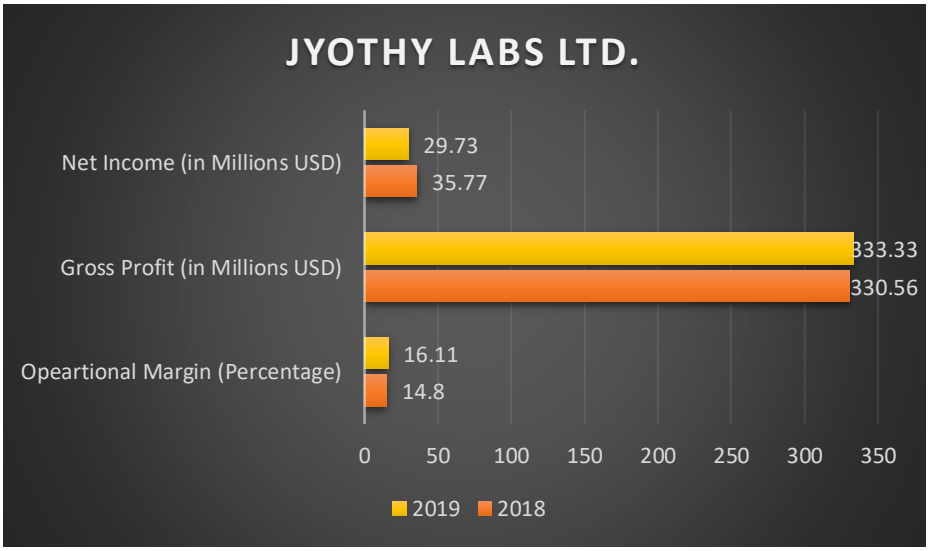

Fig:4.3 Financial Data Analysis of Jyothy Labs, India
SOURCE: Primary Research

It can be analysed from fig 4.3, that Jyothy Labs Ltd. which is a medium-scale company invested $15.93 Mn in 2017 and henceforth have seen an appreciable increase in the financial data. The success of sustainable practices implemented by the management has increased the Operating margin of the company by 1.31% from 2018 to 2019. Further the Gross profit of the same has gone up by approximately 0.9%, which is a decent gain. Because of a significant increase in these factors, the Net Income of the company has boosted up by approximately 20.3%. This reflects the fact that implementing sustainable practices in the supply chain leads to the overall development of an organisation. Being a company of Medium scale, it has enjoyed immense profits against the investment for sustainable initiatives and has been able to make a lean and green environment for fulfilling its customers. But it can be figured out that there is still some room for the betterment, because the expenses of Jyothy Labs are very high, as compared to the net income. Therefore, sustainable activities must be invested in more amounts to show a much more decrease in the operating expenses and a greater increase in the margin as well as Net Income.

4.1.1.3. ANKO GROUP, AUSTRALIA-

SIZE OF THE COMPANY	SMALL
INVESTMENT IN SUSTAINABLE PRACTICES	2.95 Mn USD

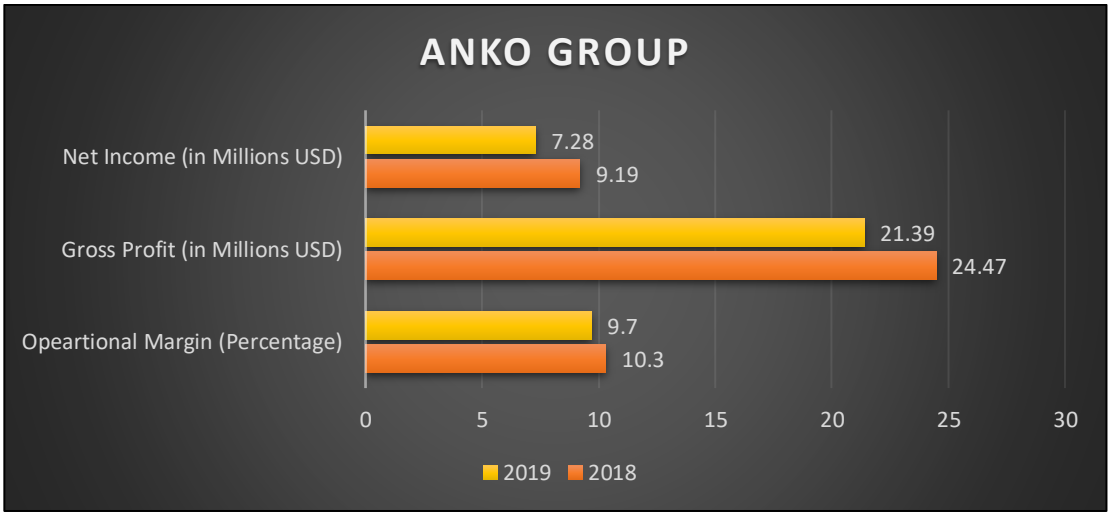

Fig:4.4 Financial Data Analysis of Anko Group, Australia
SOURCE: Primary Research

It can be analysed from fig 4.4, that Jyothy Labs Ltd. which is a small-scale company which acts as a supplier to K-Mart in Australia, invested $2.95 Mn in 2017 and henceforth have seen a decrease in the financial data. The success of sustainable practices implemented by the management has not increased the Operating margin of the company, rather decreased it by 0.64% from 2018 to 2019. Further the Gross profit of the same has also gone down by approximately 12.5%, which is a major decrease. Because of a significant decrease in these factors, the Net Income of the company has too gone down by approximately 20.7%. This reflects the fact that implementing sustainable practices in the supply chain has led to the overall decrease in the financial status of the organisation. Being a company of small scale, it can be observed that the company has not enjoyed the benefits of sustainable supply chain. This point is worth noting because till now we were of the perspective that if sustainable steps are implemented then the economic prosperity is bound to happen. But from the case of Anko Group, we can say that the same has not been proved true. The actual reason behind these can be the improper implementation and strategy behind using the steps of lean and green management. During the interview I came to know that the amount invested by the company

was not able to be recovered because they had implemented certain steps which were quite costly and not required at that very moment as per the nature of their business. Thus, we can draw an observational fact that sustainable activities must be implemented in such a manner that the feasibility of that is not overpowered but is in control of the company.

4.5. RESEARCH OBJECTIVE-5:

To figure out the emerging companies which are contributing their part effectively towards the integration of a sustainable and lean supply chain.

There have been several stalwarts in the business of CPG and Retail who have been contributing their part very effectively for the promotion of a sustainable supply chain management, either from the front end as producers or from the back foot as suppliers and distributors.

4.5.1. EMERGING LEADERS OF SUSTAINABLE SUPPLY CHAIN-

a. UNILEVER:

An undisputed leader of the CPG retail business is the Unilever group, which has a diverse product line. The company was among the first in all the businesses to adopt the Sustainable Developmental Goals by the UNO. They have minutely worked on the pin points of their supply chain and tried to eliminate wastage up to the maximum extent gradually. The products of Unilever nowadays are made up of fully recyclable and bio-degradable plastics. It has inculcated the aspects of circular economy in use.

b. PROCTER and GAMBLE (P&G):

Another stalwart of the industry is P&G. The mission of the company is to grow with the growth of the society. It has since many years paid great effort on the work of its CSR activities and ran out campaigns for the spread of education among underprivileged regions of countries all across the globe. Apart from the service of the society the company has also inculcated technological advancements in its supply chain such as the concept of Block Chain, AI and IOT, which has made it to excel easily and operate smoothly without any major disruptions. Sustainability has been possessed by the company in a whole and sole manner.

c. BILLERUDKORSNAS:

Founded in 2012, at Sweden, this company is a supplier by nature and supplies to the mega leaders of the world such as Walmart, Marico, P&G, etc. The company provides solutions of sustainable packaging, logistics and distributions. This European company has played a significant role in spreading the Plastic Waste Management (PWM) movement all across the world. They have initiated the smart working culture as suppliers and distributors and motivated many to walk the path of a lean collaboration by revitalising their operations. The material called as Fibre Form has been invented by them and is nowadays the base for all packaging materials of different products. It is completely recyclable for unlimited numbers of time. Thereby, BillerudKorsnas is meant to be appreciated.

d. E6PR:

An American start-up, E6PR is a supplier company who partners with PepsiCo, Coca-Cola, Unilever and P&G, for making the eco-friendly and biodegradable bottles for storing liquid products. They are the innovators of storage bottles and have identified advanced materials which have the properties of plastics but can be completely reused and recycled without any release of toxins. They can endure temperatures of up to 1300 degree Celsius. In the near future the company is about to come with edible bottles for soft drinks, which can be consumed with the beverages itself. Thus, there work is really remarkable in the field.

CHAPTER-5 RECOMMENDATION FOR THE COMPANIES

1. The companies can be recommended to entail and implement up the benefits of Sustainable supply chain as soon as they can, so that a scalability and flexibility can be achieved by them in their regular operations.

2. Moving ahead, the companies must keep on developing and advancing their supply chains. The concept of Supply Chain 4.0, is here nowadays which complements up with the framework of Industry 4.0. This can be the key for attaining sustainable competitive advantage.

3. The era today is not just of focussing simply upon the bottom-line or the profit, only. The time has changed rapidly and today's business demands the focus to be shifted simply from the bottom-line to the concept of **TRIPLE-BOTTOMLINE**, which refers to **People, Planet and Profit**. This means that an organisation is an ecosystem in itself and therefore they must cater for the stakeholders attached with them in the form of suppliers, employees, distributors, customers and mainly the environment. The development of the community is the key to success in today's era of business exchanges.

5.1. RECOMMENDATIONS FOR PREPARING THE SUPPLY CHAIN SUSTAINABLY DURING CERTAIN PANDEMICS-

1. Presently, because of the situation created due to the crisis of Corona Virus or the COVID-19, the business scenarios all across the globe are not well suited. The uncertainties are at its peak and disruptions in business are occurring all across the world as many of them are not able to survive the lock out of trade exchange. This has brought out several loopholes in the operation of supply chains and a major revamp is required for most of them. The ones which are surviving the crisis have also faced several issues and need to get out this. Therefore, implementing the features of sustainable supply chain will definitely help the businesses to prepare themselves

for any such pandemics in the future as well. They will be able to schedule the flow of goods in and out with much more strategic decision making and panning before-hand.

2. Constant development in terms of technology is another key which can save a business and keep its supply chain functioning at the time when everything is closed out. Perfect communication and transparency will ensure the customers are always in loop of trust.
3. Localisation of supplies and resources must be considered as viable option in future to tackle the uncertainties and disruptions in the supply chain.
4. Adopting a Supply Chain Compass will definitely help the industries to excel better in their respective businesses. The compass makes a company to work on six major aspects for achieving sustainability and success. These are namely Planning, Physical Flow, Performance Management, Order Management, Collaboration and Supply Chain strategy.

Fig:5.1 The Supply Chain Compass
SOURCE: McKinsey

It is clear from fig 5.1 that, this will give the organisations the benefits related to Service, Cost and Capital which in total will boost the agility of the business to fight such grave situations.

5. Constant upgradation of the skills of the workforce and human resources must be done in order to make them adaptable to the rapid changes in technology and match the global competitiveness.

CHAPTER-6 CONCLUSION

The following important aspects can be concluded from the entire research.

1. The CPG-Retail companies have contributed appreciably in the reduction of overall contribution of the greenhouse gases. But the challenges for them have still not reached the end as they need to take more proactive steps in curbing the illness of carbon emission to null.

2. The companies need to be adaptive about the gradual trends of the market or else they won't be able to survive the disruptions and uncertainties of today's business.

3. It is not mandatory that every time a sustainable measure is involved there will be economic prosperity in the organisation. The main focus must be on implementing the sustainable steps as per the feasibility of the business and not simply in haste out of no strategic planning, or else the flavour of sustainable development will be taken up by horrific business mistakes as well as losses.

4. The large scale industries enjoy the benefits of the Economies of Scale and thereby they can overcome the high amounts invested by them towards adopting of sustainable features for their supply chain, whereas on the other hand medium and small-scale industries might end up not achieving the economies of scale and thus may find sustainable tools as a burden. Therefore, it is advised to implement these tools as per the requirement and feasibility only. Higher hills can be climbed gradually not hastily.

5. There are several companies who have worked very proactively to change the dynamics of supply chain from the perspective of manufacturing, packaging and logistics and contributed immensely for reducing the non-value-added activities from these fields so that economic and environmental prosperity both can be achieved.

6. Below is a list of the top companies identified in the field of CPG companies serving in the personal care products which have implemented sustainable steps most efficiently as per the non-profit environmental research provider CDP.

COMPANIES	LEAGUE TABLE SCORE	LEGUE RANK
UNILEVER	2.31	1
L'OREAL	2.57	2
COLGATE-PALMOLIVE	3.64	3
HENKEL	4.92	4
RECKITT-BENCKISER	4.97	5

Table:6.1 List of best performers in CPG-personal care
SOURCE: www.cpd.research.com

7. Below is a list of the top companies identified in the field of FMCG companies serving in the food and beverage products which have implemented sustainable steps most efficiently as per the non-profit environmental research provider CDP.

COMPANIES	LEAGUE TABLE SCORE	LEGUE RANK
DANONE	3.3	1
NESTLE	3.59	2
AB-INBEV	4.43	3
PEPSICO	4.59	4
DIAGEO	4.65	5

Table:6.2 List of best performers in CPG-Food and Beverage
SOURCE: www.cpd.research.com

8. There has been a significant increase in the packaging and manufacturing waste management in the companies of CPG sector. Fig 6.1 is validating the same.

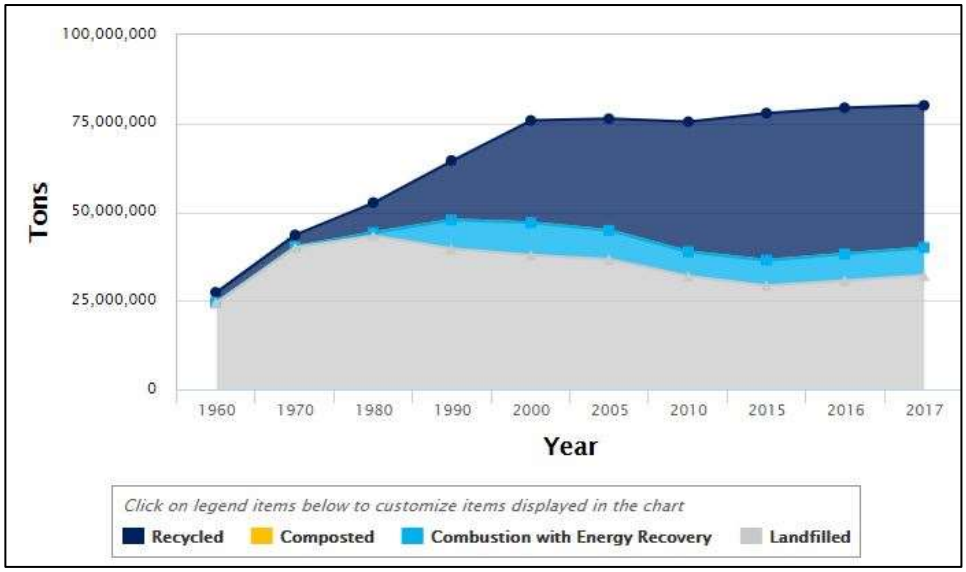

Fig:6.1 Increase in trend of waste management in packaging
SOURCE: www.epa.gov.com

9. Therefore, it can be concluded that sustainability requires the organisations to follow the steps of the **3E** that is Inculcating **Education, Ethics as well as Economics,** then only the sustained supply chain can be called as a **Value Chain.**

QUESTIONNAIRE FOR PRIMARY RESEARCH

Which sector of the FMCG does the company belongs to?
What is the scale of the company as per the annual turnover?
What are the sustainable measures adopted by the company?
How much investment did the company made towards the adoption of sustainable measures?
What changes in the finances ratios have been witnessed after the implementation of the sustaianble measures?

What is the change in the operational margin after the implementation of the sustainable measures in the company?
Have you observed any difference in the functioning of your suppliers and distributors after implementing the sustainble measures?
Will the company continue to invest further in the sustainable measures?

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