

**A STUDY OF GREEN SUPPLY CHAIN MANAGEMENT IN E-COMMERCE INDUSTRY**

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**ABSTRACT**

The manner we are using Earth's resources indicates that quick action is required. The degradation of the ecological system has produced new criteria for supply chain growth. Where sustainability is not an afterthought when it comes to e-commerce patronage. As economies increasingly adopt global supply systems, there is a compelling need to pay attention to decreasing the environmental impact of these supply chains, especially as e-commerce takes hold and supply chain management and logistics become a vital part of their business. As the e-commerce industry has risen in recent years, so has the number of unprecedented environmental problems. The concept of sustainability in e-commerce can vary from business practices to product wrapping, and its importance will grow in the coming years.

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This study examines and discusses the present situation of a green supply chain management challenge that involves e-commerce. Green standards has been set by the government authorities and company who abide by it receives green incentives. The producer can only receive an eco-label if the product meets the standard. Furthermore, these insights give counsel to businesses and a discussion of future direction and prospects.

**Keywords:** Green Supply Chain Management (SCM), Sustainability, Third-Party Logistic, Interoperability, Green Purchasing, Green Logistics, Reverse Logistics.

## **INTRODUCTION**

E-commerce is a high-energy sector, \$10.8 billion in online sales was generated by Cyber Monday in 2020, making it a predominant shopping day in history. Millions of items needed to be procured, packed, and distributed to customers. That is a lot of non-renewable resources being depleted by internet retailers like Amazon, eBay, and Walmart. The modern customer is concerned about social issues. Buyers want to know that the firms to which they send their money are ethical. This is especially noticeable in the run-up to Earth Day when businesses join

to make the shopping experience more environmentally friendly. As a result of this, India has a legal concern for the environment and greater awareness of global warming, which eventually leads to Green E-commerce. Globally, there is a heightened understanding of sustainability to respond to increasing demand for environmental challenges. (Linton et al., 2007)

Managing the movement of goods and services is considered SCM (Supply Chain Management), and it includes all processes from RM (Raw Material) to FG (Finished Goods). It entails actively simplifying a company's supply-side processes to optimize customer value and obtain a competitive edge in the marketplace. Supply chain management (SCM) centralized the flow of goods and services, and it encompasses all operations that convert raw materials into finished commodities. The notion of incorporating sustainable environmental operations into the traditional supply chain is referred to as 'green supply chain management (GSCM). Product design, material sourcing and selection, manufacturing and production, operation, and end-of-life management are examples of such processes. (Heckmann et al., 2015)

GSCM emphasizes promoting value creation throughout supply chain organizations to lower total environmental effects rather than merely aiming to mitigate the supply chain's environmental impact.

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While the specific goal of GSCM is often to reduce CO<sub>2</sub> emissions, other tangible benefits for an organization include increased asset efficiency, less waste production, greater innovation, lower production costs, reuse of raw materials, increased profitability, client perception of added value, and so on. GSCM approach is taken by both Upstream and Downstream (suppliers and customers) partners in the supply chain. (Onat & Bayar, 2010)

Electronic commerce (e-commerce) is a business strategy that allows organizations and people to buy and sell products and services online. Ecommerce is managed using computers, tablets, smartphones, and other smart devices in four primary market areas. Green e-commerce (Or sustainable e-commerce or eco-friendly e-commerce) is the practice of firms selling products and services online while considering the environmental effect of conducting business and attempting to lessen that impact.(Ghadge et al., 2012)

Two simple steps that companies can take to Go-Green:

1. Reduce website's carbon footprint – Green Web Host.
2. Use Eco-Friendly packaging – Biodegradable Packing; Use recycled materials.

## **NEED FOR THE STUDY**

The study's major goal is to see how e-commerce businesses in India might implement GSCM in a way that is both sustainable and environmentally beneficial. Because India is a signatory to the Paris Agreement 2015 (the Paris Agreement is a legally binding international pact on climate change), adopting green practices has become a top concern for every Indian company (zero carbon emission).

Since the development of online shopping via apps and websites, there have been numerous logistics and supply chain issues, as well as an increase in waste and carbon emissions. According to Global Data (Data Analyst

Company), the Indian e-commerce market will expand by 21.5 per cent to \$74.8 million in 2022 so there is an urgent need, to bring sustainability in this sector. (• *Supply Chain Industry: Supply Chain Challenges in B2B e-Commerce 2018* / Statista, n.d.)

As per the environmental group, up to 22.44 million pounds of Amazon's plastic packaging ended up as pollution in global freshwater and marine ecosystems in the same year, which is "roughly equivalent to a delivery van's worth of plastic being dumped into major rivers, lakes, and the oceans every 70 minutes." This is a threat to the world's ecosystem as this waste is polluting the water bodies and

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harming the aquatic fauna.(• *Supply Chain Industry: Supply Chain Challenges in B2B e-Commerce 2018* | Statista, n.d.)

This study examines the viable solutions that e-commerce companies around the world are implementing to improve waste management and reduce carbon emissions. Also, feasible methods for raising public knowledge about proper packaging trash disposal on a big scale.

## **OBJECTIVE**

The research objectives are:

1. To investigate the impact of Green Supply Chain Management on organizational performance in the e-commerce business.
2. To investigate the effects of environmental issues on the supply chain in the e-commerce business.
3. To examine the various problems that the e-commerce business faces in transitioning to green supply chain management.
4. To discover several methods that have an impact on the long-term viability of a green supply chain.

## **RESEARCH METHODOLOGY**

In our study, the data collected is from the authentic secondary resources from research papers, books, and websites of the companies, case studies as well as journals across the globe and was collected between February 2022 - March 2022. In this article, the systematic and content analysis method is utilized to review the literature. This strategy is used in some studies to acquire valid data to generate fresh insights, a thorough knowledge for readers and researchers, and management or practical actions.

## **LITERATURE REVIEW**

Nowadays, SCM has received popularity in the last 2-3 decades, many firms are gravitating towards global sourcing of suppliers, and customers, demanding timely delivery of high-quality products, and global markets are characterized by dynamism and uncertainty. (Gupta & Palsule-Desai, 2011). The biggest issue faced by green logistics & supply chains is dealing with pollution and to combat it researchers have developed a few optimization models that investigate cost and pollution. Now a day's

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people are more concerned about sustainability in every aspect be it production or distribution. (*Green Supply Chain Management Research Papers - Academia.Edu*, n.d.)

Vehicles emit a large amount of carbon dioxide and carbon monoxide, both of which contribute to global warming. There has been an increase in the transportation and logistics of goods since the inception of the e-commerce business. The fast expansion of Internet shopping has led to a significant increase in product packaging (Andaloro et al., 2015). However, this results in a great amount of packing trash, which pollutes the environment. For, By a sustainable supply chain, Dell saves 20 million Dollars per year because of supply chain and packaging improvements. This market leader achieved its goal of becoming carbon neutral by 2008. (*Fawcett: The Rhetoric and Reality of Supply Chain...* - *Google Scholar*, n.d.)

The notion of GSCM is being proposed by academics and practitioners as a potential option for increasing environmental performance. Although the notion of GSCM was first proposed in the early 1990s, its popularity grew after two thousand, as evidenced by the increase in academic publications. GSCM is regarded as a comprehensive method that combines environmental considerations into a supply chain (Taefi, 2016). This paper also discussed comparisons for GSCM implementation with developed and developing countries because there is an enormous difference in how countries manage these things, such as how India and China will manage it will be completely different from how the United States, the United Kingdom, and Australia will manage it. (Zhu et al., 2007)

GSCM methods can help to improve a supply chain's environmental capacity and ensure that environmental standards are satisfied. Green purchasing, product life cycle management (covering suppliers, producers, and consumers), and reverse logistics are all part of GSCM(Sarkis, 2003). GSCM approaches have been structured into five dimensions:

- Internal environmental management
- Green buying
- Customer cooperation
- Investment recovery
- Eco-design

GSCM methods are widely applied in manufacturing but not much in service industries. In addition to that, the fast expansion of internet shopping has led to a significant increase in product packaging. However, this results in a great amount of packing trash, which pollutes the environment, wastes resources, and produces a slew of other problems. To improve customer service and happiness, online

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retailers make sure that the products are well packaged so that they do not get damaged (*Conducting a Literature Review — The Example of Sustainability in Supply Chains* / SpringerLink, n.d.) As a result, the volume of the product grows, taking up more room in the vehicle than is required. Plastic bags, foam, and adhesive tape are examples of polyvinyl chloride or polystyrene items

that are not environmentally friendly. Many of them cannot be degraded or take hundreds of years to deteriorate. (Gupta & Palsule-Desai, 2011)

### Supply Chain Management – Green Practices:

After adopting the green implications, organizations can improve productivity with better environment growth and can also increase the customer base as today's customer is also interested in knowing how the company is working and whether it is eco-friendly or not. (Guide et al., 2000)

Below mention are some of the Green Practices –

1. Supplying of Green Material – Company purchasing Raw material which is eco-friendly, recyclable or reusable.
2. Green Marketing – It advertises the product as environmentally friendly.
3. Green Management – Green management practices (GMP) offer a company an additional source of information that can help them achieve its economic and environmental goals. Adoption of green management methods contributes to enhanced business image, higher efficiency, improved environmental compliance, cost savings, attainment of social commitment, and reduction of carbon emissions, among other benefits.
4. Green distribution and warehousing – It can reduce waste and play a key role in energy reduction, and the value addition of green products in warehousing significantly improves the overall performance of the organization while promoting a positive corporate image.
5. Green manufacturing – To prevent any harmful effects from manufacturing firms should use green practices. Productivity and efficiency will also grow. Green & Lean Manufacturing focuses on the removal of waste from manufacturing.
6. Ecological Design – It has been considered that most of the environmental effects can be reduced after adopting the feasible design in the SCM.

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7. Green Logistics – After adopting these kinds of practices organization improves its image in Infront of the customer and can increase sales.

8. Renewable energy and biofuels – Every organization depends on fossil fuel, which is the main reason for this elevated temperature (Climate change), increase in pollution or greenhouse gas emission. Hence, the organization needs to put their focus on green practices. (*ResearchGate*, n.d.)

Eco-Label policy and dual-channel green supply chain research. Consider a Green supply chain management scenario that involves both retail and direct channels to get a perspective on two sorts of green products. The government establishes a green standard for products and provides environmental incentives to the company.

(Golicic et al., 2005). To receive an eco-label, the product must meet the requirements. In this research, we will look at two different sorts of green products that use various green technologies. According to GSCM, environmental concerns are included in inter-organizational practices of sustainable SCM including reverse logistics. (Seuring et al., 2004).

SSCM is related to the integration of environmental and social objectives. According to the literature, when organizations form collaborative partnerships with their suppliers, the supplier's concern for sustainability has the greatest influence. However, today's suppliers lack sufficient financial resources and information to improve their company's sustainable performance(Kotzab et al., 2005).

As a result, green procurement policies must be developed in such a way that they can detect the reality adhering then simply adhering to the terms and conditions on paper. Eco-Labeling systems have also emerged to track the level of sustainability initiatives in manufacturing. (Guide et al., 2000).

## **HYPOTHESIS**

1. There is no association between Global & Domestic Green SCM practices of eCommerce industries.
2. There is an association between Global & Domestic Green SCM practices of eCommerce industries.

## **ANALYSIS**

**Global Packaging Practices –**

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- Green packaging is referred to as sustainable packaging.
- It reduces the use of energy.
- It reduces the negative environmental impacts.
- In these the biodegradable and eco-friendly materials are used for packaging, and plastics and polystyrene foams are omitted.
- The use of packaging that has low carbon footprints is promoted. (*Packaging Waste*, n.d.)

The Packaging Directive is intended to -

1. Align national packaging and packaging waste management policies
2. Provide a high degree of environmental safeguards.
3. Ensure the smooth operations of the internal market.

The most recent revision to the Directive includes revised steps to -

1. Reduce the amount of packaging waste produced, and
2. Instead of disposing of packaging trash, encourage its reuse, recycling, and other kinds of recovery. (*Waste and Recycling*, n.d.)

Among other things, EU members should ensure that producer responsibility programs for all the packaging are in place by the end of 2024. The Directive also establishes the following recycling objectives –

**Table 1: Recycling Objectives of EU**

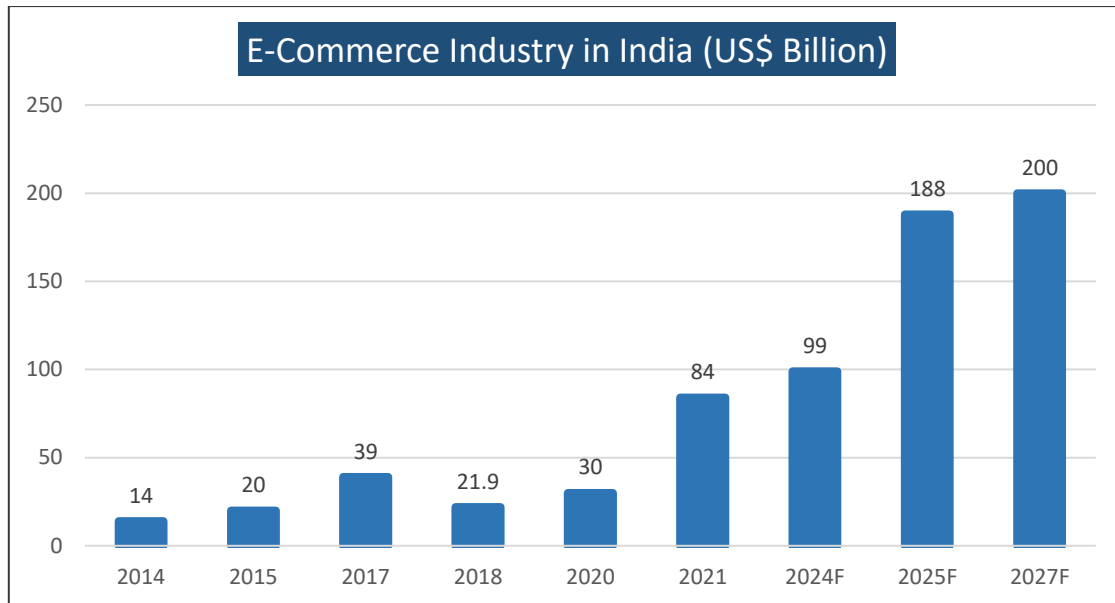
	Current targets (%)	By 2025 (%)	By 2030 (%)
All packaging	55	65	70
Plastic	25	50	55
Wood	15	25	30
Ferrous metals	50 (incl. Al)	70	80
Aluminium	-	50	60
Glass	60	70	75
Paper and cardboard	60	75	85



Source: (*Packaging Waste, n.d.*)

The market size of the e-commerce industry across India from 2014 to 2021, with forecasts until 2027 where 'F' represents the forecast:

**Graph 1: E-Commerce Industry in India (US\$ Billion)**



Source: (• **E-Commerce Revenue in the World 2017-2025 | Statista, n.d.**)

## ❖ Now we'll look at two giants of India's e-commerce industries -

**7.2 CASE OF AMAZON** - Amazon has taken a sustainable pledge of reaching 80% renewable energy by 2024 and 100% by 2030. It has taken the initiative of combining 2 to 3 orders of a custom in the same package to reduce landfill waste. (*Goals and Progress, n.d.*)

### ✓ Push-pull strategy -

It has moved its warehouses in cities and forecasts the demand, which reduces the transportation so less pollution and hence it is a pure push strategy. And a pure pull strategy when it sells from 3rd party sellers. (*Amazon: Everything You Wanted to Know | IEEE Computer Society, n.d.*)

### ✓ Sustainable global supply chain at Amazon -

The supply chain of Amazon is centred on cost, speed, flexibility, quality, sustainability, and innovation. Its supply chain maximizes operational efficiencies. It follows a modern supply chain. To

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make sure it is sustainable Amazon has started the fulfilment by Amazon (FBA Services) for easy communication and reduced movement waste which leads to reduced greenhouse gas emission. Amazon wants to have complete control over the supply chain by blending vertical and horizontal integration. (*Free Cloud Computing Services - AWS Free Tier*, n.d.)

One of the major reasons behind Amazon's success is its innovation strategies. For any e-commerce facility, a significant role is played by its logistics and supply chain. And to make, its effortless technology is required. (*What Is Amazon Logistics Tracking? A Seller's Guide*, n.d.)

### ✓ Few major ways amazon strengthens its supply of chain management -

1. Automated warehouses: Under this system, a network of Roomba like robots are connected by a central system to pick up and drop warehouse shelves as per the requirement. This plays a huge role in the fast delivery of products by Amazon.
2. Plug and play technology platform: This integrates the individual sellers with the API where information sharing turns out to be easier and in turn, it helps with supply chain management.
3. Amazon Prime Air: To strengthen its supply chain Amazon is planning to launch unmanned drones soon which will deliver the product in 30 minutes without any hassle.
4. Mentor: It is an app used by amazon to track the package to maintain visibility and create efficiency of the supply chain.
5. Blockchain: Under this, all the parties are provided with the same supply chain which leads to reduced communication and increased efficiency in the supply chain. (*5 Amazing Technologies That Amazon Pioneered and Popularized*, n.d.)

### ✓ Climate Pledge by Amazon:

Amazon pledged to go carbon neutral by 2040 and create a climate pledge fund, started with an investment of \$2 billion in companies that are creating product service and technologies which aims to protect our planet from climate emergencies. Amazon is also developing a program that will help customers to discover more sustainable products.

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The company is also planning to label the product that has more than twenty-three sustainability certification that will help to preserve the flora and fauna of our world and creates a healthy environment for us. (*Sustainable Operations*, n.d.)

✓ Amazon follows the following steps to go carbon neutral:

1. Regular Reporting

The company measures greenhouse gas emissions on regular basis. Amazon Map their largest activities which create an impact on the environment.

2. Carbon Elimination

Amazon is implementing strategies to go carbon neutral by bringing in innovations in technologies, reducing materials and improving the efficiency of the work in line with the Paris Agreement 2015. Amazon is strategizing more use of renewable resources. Many operation facilities in Europe, the US, and India work on solar energy. (*Carbon Footprint*, n.d.)

✓ Transportation:

Amazon in 2021 started e-vehicle delivery in Los Angeles and will expand this e-vehicle delivery system in 15 countries. By 2030, the company is planning to deploy 1,00,000 electric vehicles on the road.

**CASE OF FLIPKART** - Flipkart Group (FG) Partnered with Canopy for sustainability and conserve Forests. Its collaboration with Canopy enables its supply chain to improve global forest protection. Flipkart is actively contributing to the conservation of the planet's old and endangered forests by using sustainable forest-derived materials solutions.

▪ Aligning Objectives:

Flipkart practices 5-R policies -

1. Reduce
2. Reuse
3. Recycle
4. Refurbish
5. Regenerate

▪ 3-Year Roadmap:

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Create a strategy for procuring all paper, packaging, and manufactured cellulosic fibres in a way that does not destroy ancient and endangered forests. Should support that benefit the environment. Finding alternate fibre sources which reduce GHG. Requesting that suppliers recognize and support Indigenous and rural people's legal rights to their territory, land, and resources. Before allocating additional logging, rights or developing plantations, efforts shall be taken to secure their consent. (*Flipkart Group Companies Commitment to Protect Forests Through Our Paper, Packaging and Fabrics Choices*, n.d.)

- Looking Packaging objectives:

Emphasis should be placed on recycled materials and the elimination of single-use plastics. Reduce your use of corrugated paper and paperboard. Alternative, such as wheat straw or other waste, will be used to make packaging and paper. We will also encourage the commercialization of alternative fibre-based paper, pulp, and packaging. (*HARNESSING E-COMMERCE FOR SUSTAINABLE DEVELOPMENT*, n.d.)

- Flipkart's 1st milestones:

Around 70 Flipkart locations employ plastic-free packaging, as part of a strategic transition toward more sustainable, economical, and scalable solutions. Replacing - bubble wrap; Replaced by - environmentally friendly carton waste and two-ply rolls, swapping poly pouches for recycled paper bags, and more. We were able to transport around 15% of items without the supplementary layer of packing after implementing 'Ecommerce ready packaging. (Davila et al., 2010)

- Sustainable Brands:

Flipkart uses GRS (Global Recycled Standard) certified textiles as well as FSC (Forest Stewardship Council) certified tags. The polybags used - 50% Recycled claim substance. (*HARNESSING E-COMMERCE FOR SUSTAINABLE DEVELOPMENT*, n.d.)

Myntra is also a subset, collaborating with LENZING<sup>TM</sup> ECOVERO<sup>TM</sup>. This brand uses an eco-friendly production technique to obtain fibre from certified sources. It follows environmental regulations and provides a special viscose fibre (i.e., EU Ecolabel). Myntra launched 'FSC MIX brand paper hang tags,' which saves 288 trees each year. (Thakkar, n.d.)

- Flipkart Group Commitment to Protect Nature Through Various Choices:

The Flipkart Group, which comprises group firms Flipkart, Myntra, Flipkart Wholesale, and Clear trip, is one of India's largest digital companies. Flipkart received ISO 14001 certifications in recognition of its ongoing efforts to establish sustainable operations.

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## ▪ Conservation of Forests and Ecosystems:

- 1) The FG will emphasize the creation of a reduction and reuse. The Group will investigate obtaining or creating reusable/refillable shipping boxes to limit the use of corrugated paper and paperboard.
- 2) Create & install such systems that utilize as little paper as materials for packaging.
- 3) Increase the use of recyclable materials in our packaging.
- 4) Use Reusable packaging technologies.
- 5) Boost utilization of digital marketing with communication and systems of accounting.  
(Packaging Shipping Products - Buy Packaging Shipping Products Online at Best Prices in India | Flipkart.Com, n.d.)

## ▪ Shifting towards beneficial Fabrics:

FG will establish a preference for acquiring manufactured cellulosic products that contain at least 50% of these new fibre sources in 2022 and Target 2025, for innovative solutions based on viscose fibre.

## ▪ Improve Packaging and Quality of Paper:

FG will Conduct a yearly evaluation to identify and to see an area of improvement. Give priority to paper packaging so that it can easily be recycled, especially after the customer takes out the product and through the wrappers, to obtain an overall reusable fibre of at least 80% within three years. Also, appreciate the supplier using material that can easily be recycled. (*Flipkart Group Companies Commitment to Protect Forests Through Our Paper, Packaging and Fabrics Choices*, n.d.)

## ▪ Forest Certification:

FG will prefer suppliers who will take responsibility for forests, and they should be certified with Forest Stewardship Council and have FSC certified products like packaging and paper products. FSC has systems to promote endangered species, forest protection and Free Prior and Informed Consent (FPIC). (*National Guidelines on the Economic, Social and Environmental Responsibilities of Business 2018*, n.d.)

## ▪ Practices and Procurement:

Manufactured cellulosic is mandated by Flipkart Group, a process using the greatest possible environmental methods, such as 'closed-loop' lyocell processing. We will prioritise acquiring paper and packaging that has been prepared through modern technology such as chlorine-free bleaching. In acknowledgement of the health advantages this will have for our staff and customers, we will transition to non-phenol and BPA/BPS (Bisphenol A (BPA) and bisphenol S (BPS)) free receipts for in-store

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usage. (Packaging Shipping Products - Buy Packaging Shipping Products Online at Best Prices in India | Flipkart.Com, n.d.)

Flipkart has started many green initiatives in the past four years and after doing analysis we have analysed that as they launch the green initiatives revenue with the time also increases.

**Table 2: Green initiatives are taken by Flipkart**

Green Initiatives taken by Flipkart	
Major Green Initiatives by Flipkart	Date
Flipkart launches 2GUD, a new e-commerce value platform for refurbished goods like smartphones, laptops and accessories initially; extending to several other categories including appliances	22-August-2018
Flipkart inaugurates state of the art 'Green datacenter' at Hyderabad, Telangana. Flipkart's new datacenter is a part of one of the largest private cloud deployments in the country and will help strengthen its growing marketplace e-commerce business in India	22-April-2019
With electric vehicles, Flipkart is making last-mile delivery sustainable in India. Flipkart aims to replace nearly 40% of its fleet of last-mile delivery vehicles with electric vehicles, starting with 160 e-Vans	27-June-2019
A LIFE LESS PLASTIC Flipkart outlines vision to eliminate single use plastic. Introduces renewable alternatives and recycled plastic to replace plastic use in packaging	29-August-2019
100% electric mobility by 2030 — Flipkart drives towards sustainability with EV100. Flipkart the first e-commerce organization in India to introduce electric mobility for deliveries at scale, it is the first e-commerce marketplace in India to join The Climate Group's EV100 initiative.	25-August-2020

Source: (flipkart-timeline-milestones, 2022)

## OBSERVATION

Organizations like Amazon are trying to achieve sustainability by green supply chain management and making it their core competency. Organizations are not only focussing on their own but also on the supplier like what they are procuring and how they are procuring as it will impact the environment. As per the research, it is observed that e-commerce organizations use approximately 30,000kg of plastic per day out of which 10,000kg of plastic is not disposed of properly by the customers. This is also a big concern raised by organizations and to combat it they are educating the customers about the disposition process.

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After analysing e-commerce companies, we discovered that global organisations bring their global practices to our domestic country. Hence, the Null Hypothesis proved wrong.

## **CONCLUSION**

E-commerce companies must focus on every step of the supply chain to achieve sustainability. Nowadays customers are leaning towards the 3Rs (Reduce, Reuse and Recycle) which is a great challenge to organizations.

After doing the Study on eCommerce companies we have found that every organisation is switching their Supply Chain Management towards the Green Revolution. There are a few reasons that we have identified that are acting as a driving force for the organization.

1. Customer behaviour - The trends are changing these days as the customers are now more concerned about the environment and prefer the companies that are an environment centric which hugely impacts the sales of the company.
2. Government - Due to rising pollution government has made and implemented the environmental laws way more strictly. as the organizations directly or indirectly impact the environment.
3. Social & Environmental Responsibility - Following current trends, organisations are now focusing on sustainable goals by meeting their social and environmental duties, which helps to enhance sales.

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