



Comparative Analysis of Stakeholder Engagement Strategies in Implementing Green Reverse Logistics: A Study of Paper and Packaging Manufacturers in Asia and Europe

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Abstract

While many green initiatives are seen as key survival strategies across many organizations in the global printing and packaging industry and its eco system, the newest initiative found is green reverse logistic practice. The Printing and packaging industry and its total supply network, being the permanent polluter, needs to spear head those implementations to sustain the world. Many researchers argued that the purpose of implementing green practices is more than the sustainability driven responsibility. There is a profitability motive as well. Therefore, implementing reverse logistics practices has become pivotal for sustainable and profitable growth. Among many factors that influence the effective establishment of green reverse logistic practices, stakeholder engagement was selected as a key independent factor to probe into. Hence, this study attempts to reveal how stakeholder engagement strategies could strengthen the effectiveness of green reverse logistics practices. This research is aimed at investigating how stakeholder engagement strategies influence in implementing green reverse logistics practices while providing impactful insights into the printing and packaging industry and its supply network. A secondary data based qualitative comparative case study research strategy was employed focusing on two global companies under the P&P industry in Europe and India. Secondary data gathered from Annual reports and journal articles were analyzed using a thematic analysis and a comparative analysis was constructed in uncovering the patterns and themes in common. The findings disclose that both companies have aligned strategies but under different models. The study also revealed that there is a positive relationship among the engagement strategies and their impact on implementing reverse logistics practices. Stakeholder support, including organizational support, is well needed. Company specific strategies should be addressed in a tailored way in addressing the importance of following a sustainable path eventually.

Keywords: Closed loop supply chain theory, Engagement strategies, Green reverse logistics, Industry, Printing and packaging Stakeholder Sustainable development.

1. Introduction

Globally there are many countries striving to implement circular economy models in order to overcome the challenges set in environmentally harmful manufacturing as well as consumption practices and behaviors. These behaviors and activities have dramatically disrupted total natural ecosystems and resulted in widespread degradation of environmental sustainability. Literarily regulatory stakeholders such as governments and policy makers are continuously enforcing printing and packaging (P&P) companies to establish green initiatives in today's context, however if internal stakeholders do not engage adequately; the establishment of green reverse logistics practices (GRLP) will also be a mirage. Because it is evident that most of the successful sustainability stories of global organizations were built on the combination of "top-down" and "bottom-up" strategies they have adopted. In this context, both internal and external stakeholder engagement, relevant strategies and their thrust on establishing sustainable practices within the P&P supply chain could be a hot topic. The environmental sustainability aspect of P&P supply network consists of raw material suppliers, printing and packaging companies, resource tool suppliers, consumable suppliers, logistic providers, equipment suppliers etc. However, considering the major portion of the material, energy and water consumption viewpoint, paper and board manufacturing companies of P&P supply network were selected as "case companies" to investigate.

ITC is a key tier one supplier in P&P industry in India and Stora Enso is a European company specialized in the same domain. Both leading companies in the printing and packaging (P&P) Industry known for providing sustainable practices and ethical business conduct. Both companies are driving along with the transparent sustainable practices towards enhancing long-term ecological perspectives. There are many incentives that drive

the organizations towards sustainable practices. Economic interests, social interests and environmental interests are key driving forces into these adaptations. Moreover, the P&P industry is known to be the main polluter (Hayta & Oktav, 2019). Thus, following environmentally friendly practices is essential yet a push from the stakeholders is also a key driving factor for these companies to move forward with sustainability.

Within the complete logistics mechanism, it is comprised of forward logistics as well as reverse logistics. When it incorporates the whole cycle, forward logistics are about serving the forward supply chain that followed in making profits. On the flip side, reverse logistics is a proactive or a legal requirement that prioritizes environmental protection followed by the cost optimization. The ultimate goal of reverse logistics (RL) is to reclaim the values through repair, recycle, reuse refurbishment and dispose of the waste accordingly. This is about maximizing the resources efficiently (Munuhwa & Mawonde, 2025). The P&P industry has a close link with the environment since it uses natural resources for their core ingredient of paper. Therefore, the industry has an important role in balancing the eco system resulting in a substantial reduction in producing waste and usage of natural virgin resources (Hayta & Oktav, 2019). Thus, effective RL practices are essential in reducing the natural eco-logical burden. By initiating green reverse logistics (GRL) most organizations are able to reduce waste and minimize the carbon footprint while conserving natural resources. However, GRL is merely not a duplication of forward logistics. It has its own challenges. In the view of Abdulrahman et al. (2014), it was observed that implementing GRL will result in a vast amount of challenges and obstacles, may it be internal or external. It was also pointed out that the adaptation of GRL has been delayed due to the lack of enthusiasm from different parties in the supply chain (Bernon et al., 2018). The study aims to address a notable gap in the research in understanding the interplay among the stakeholder engagement strategies and GRL practices. Even though the adaptation of GRL is needed in any organization yet the influence created by stakeholders in adopting those into their business needs to be examined. Furthermore, there has been no research done in the scope of the stakeholder engagement and the adaptation of GRL practices within the P&P manufactures. Based upon these, the authors aim to compare and contrast the interrelationship between stakeholder engagement and the integration of GRL practices in Stora Enso and ITC. The study puts further emphasis upon providing the most suitable practices that will enhance GRL practices among the industry. Thus, objectives of the study are:

1. To identify the key stakeholder strategies and practices implemented by Stora Enso and ITC.
2. To recognize key green reverse logistics practices adopted by Stora Enso and ITC.
3. To compare and contrast interplay between stakeholder engagement strategies and green reverse logistics practices in Stora Enso and ITC.
4. To identify the most suitable stakeholder engagement strategies and practices that would enhance the GRL practices in the industry.

The research is designed to achieve those objectives based on the secondary data. The study adopted a deductive approach, where the data are collected from existing literature and the other supportive documents extracted from published data of respective companies. The research strategy is a comparative case study under secondary based qualitative methodological choice. The thematic analysis and the comparative analysis are used in explaining how the stakeholder engagement practices ease the adaptations of GRL practices in the companies of Stora Enso and ITC.

The rest of the paper is followed by the theoretical overview of the RL and stakeholder engagement strategies and the theoretical framework. Moving forward, the methodology segment will consist of the research methods the study employed. Later, the data will be analyzed and insightful practices that could be adopted in the industry will be provided.

2. Literature Review

With regard to GRL, Closed Loop Supply Chain Theory (CLSC) plays an essential and beneficial role in saving natural resources and reducing pollution. This is all about sustainability. It is considerably worthwhile for the companies to collect products from the end point and return those products back to the manufacturer. The theory suggests that closing the end point of the forwards logistics back to the starting point enabling the reverse process while creating value to the returned products. However, in order to close the loop, the GRL process needs actions as of recycling, repair, remanufacture, reuse and proper disposal (Shekarian & Flapper, 2021). On the other hand, every industry differs from the respective GRL practices the organization has to carry forward (De Giovanni & Zaccour, 2013). In the view of Anvari (2023), it was observed that closed loops are in line with the forward and backward. Thus, the reverse logistic is understood as taking back what is left from the customer point and back to the market under a usable condition.

The CLSC theory enables the reuse and recovery of resources while reducing waste generation and environmental pollution. This includes the elements of GRL, and it provides valuable benefits such as reducing the usage of virgin raw materials, greenhouse gas emissions and energy. Further, it saves the materials through optimizing the logistics as well as inventory management. Above all, CLSC is applied for the benefit of social responsibility where it considers the ethical implications under the supply chain process as providing labour and community engagement (Akbari-Kasgari et al., 2022).

There are many definitions of RL. However, in understanding RL, the definition provided by the Reverse Logistics Executive Council stated that it is planning, controlling and implementing the flow of materials, starting from the point of consumption towards the point where it recovers the actual value. In the literature of Agrawal (2016), this is the opposite of forward logistics. It is clear that the importance of adopting RL into their business operations has increased significantly and also it acts as a strategic tool in moving forward with competitiveness. Thus, RL starts from the customer point of view where the product might go through different stages of repair, reuse, remanufacture, recycle and proper disposal where no further economic value has existed (Pushpamali et al., 2019).

2.1. Key Green Reverse Logistics Practices Adopted by Stora Enso and ITC

Reusing is one component of GRL practices where the product or component returned by the customer is reused since it has only been used up to a minor degree. When the product is reused the usage of virgin materials

decreases. Thus, it aids in enhancing the environmental performance. However, the steps of taking back the product from the customer are much more complicated than the forward logistics (Zhang, 2024). As per the context of the P&P industry, the process might get further challenged due to extra technologies and steps that have to be undertaken. One could argue that GRL meets the main objective of the circular economy, yet the quantity and the quality of the returned products and which stage the product or the component should go through (Moigne, 2020). In the context of Stora Enso, it is promoting fiber-based materials for packaging that could be reused. Thus, it was observed that reusing the packaging provides a major opportunity in retaining the functionality of the product and reducing the negative environmental impacts and material usage. However, recently it was observed that a new trend has emerged where the customers are throwing away the reusable package after one-single-use. These developments have brought up a rapid increase on the waste volume. Even though reusable packaging has brought a positive impact upon the environment, yet the consumer preferences for reusable packages need attention (Rigamonti et al., 2018).

It is no doubt that GRL practices are aiming for sustainability while reducing negative externalities towards the environment. It is evident that the incorporation of GRL practices towards waste management does in turn be in line with the aim of the GRL practices. In the view of Wu (2022), the most common way to manage waste is to avoid waste from generating or turning waste into something valuable. Through waste management, organizations are able to segregate the product or the component accordingly and reduce the number of landfills generated from waste (Sundram et al., 2016). When the process is diverted through GRL by enabling the factors of recycling, reuse and repair the recovery of the value of the materials that were to be disposed of is high. However, Kinobe et al. (2012), argued that waste management and RL are two different approaches where RL is mainly concerned in adding more value to the product which has been returned and reentered to the supply chain. On the flip side, waste management is about separating the collected waste and treating that waste which has no value integrating. It was observed that the main purpose with GRL practices in collaborating the waste management, is safeguarding the collection of garbage, separating and transporting, followed by storing and reprocessing where needed. In the context of the P&P industry, waste recovery is essential which in turn originates at the production process to be recycled which in turn is in line with the GRL practices. Globally paper is amounted to 20% of the waste where it could be recycled in mass operations. It was further proved that if 100 tons of paper is recycled, the world will be able to save 1 hectares of 100 years old forest. In line with the ITC company, they are currently engaged in an in-house recycling process where it uses recyclable paper boards produced by wood-fibers. In terms of Stora Enso, the usage of materials up to 97% are used in producing renewables, where less wastage occurs. Mainly the packaging of cuts and fiber scraps are reprocessed to reduce the waste. The ultimate goal of waste management is to prevent the production of waste and reduce the quantity of waste with developed technologies. The protection of these natural resources and products and components produces, while using less virgin materials could be attained through GRL practices. Thus, managing the waste through recycling, reusing the products rather than landfilling, using the waste as a solution for energy source will ultimately reduce waste and enhance the environmental performance (Zatrochová et al., 2021).

The integration of rework towards GRL practices is also in line with the closed loop supply chain system. It was observed that CLSC is increasing the efficiency of the resources as well as the environmental performance. GRL practices are about attaining the returned products back to the starting point with the intention of recycling or reuse. In terms of the rework, it is about recorrecting what was defected in meeting the standard quality. The usage of digital technologies has strengthened the sustainability among the P&P companies. During the operational activities, these resilient developments have vastly aided in making error free productions and enhanced the quality of the work. Artificial Intelligence (AI) and Internet of Things (IoT) have changed the traditional processes of manufacturing towards the most developed industrial plant (Puccetti et al., 2022). ITC and Stora Enso have invested in smart lines in terms of printing and packaging lines and digital mechanisms in verifying the quality and tracking down the defects at the early stage. ITC is currently reprocessing the off-specification packages back into the pulp and reintegrating towards the paper making process. This type of rework has drastically reduced the virgin raw materials, and also the production waste moving towards the landfills. However, incorporation of digital technologies has enhanced the pinpointing of the off specs products (Varriale et al., 2023). On the other hand, the company should be paying attention to reshaping these adaptations with an effective sustainable process.

The goal of GRL practices is to recreate the value it might have lost if it moves towards waste. Recycling is known to be another element under GRL practices where it enhances resource use, reduces pollution and achieves environmental benefits. In the context of packaging, recycling the package materials has become very vital. The packaging could be recycled and then reformed towards renewable resources. However, the concept of recycling the packaged materials has its own economic aspects and environmental laws too (Senarathna et al., 2023). Paper recycling is popular in both companies. It decreases the need for virgin materials and the loss of useful resources. By recycling the world was able to save 25% to 40% of the solid waste which could have been burnt off or landfilled. It was not recommended to burn since it creates large amounts of toxic gases. However, it was observed that paper recycling has some negative impact where the quality of the paper mattered. The recycled paper has a lesser quality than the paper made from fresh pulp. It was found that only seven times the paper could be recycled since the paper fiber gets destroyed in time. On the other hand, with the use of electrography and the advancement of the technology, this has somewhat reduced the effect through toner, printer and the final colour (Sonmez et al., 2022). But the roughness has its own negative impact too. Stora Enso has currently reduced the materials that are fossil based by offering recyclable and renewable product packages upon liquid food cartons, personal care product packages and many more. This has enormously improved the efficiency of resources. The same is followed by ITC where the packaging materials are produced through natural renewable fibers such as bamboo and wood. It was identified that the company was able to produce 89,000 tons of wastepaper and was able to reduce the landfill drastically.

2.2. Key Stakeholder Engagement Strategies Implemented by Stora Enso and ITC

Along with sustainable developments it is essential to address the benefits from the views of economic, social and environmental factors. Stakeholder theory is internally based where the company is hoping to achieve the objectives of the company through stakeholder management. The influence of the stakeholders is divided as primary and secondary. The stakeholders might voluntarily or involuntarily be related to the company (Nora et al., 2022). This theory is about ethics of the business as well as the management of the organization. The Stakeholder theory does matter since it encourages ethical business by supporting the success of the long term through sustainability (Schaltegger et al., 2017). Yet the organizations are targeted in generating benefits that would meet different stakeholders' needs. Thus, it is crucial that the stakeholders become vital and hold important roles within the organization's activities among sustainability performances.

Stakeholders have some interest in the company. Thus, it may be a legitimate interest, expectations or claims towards the organizations and their operations. It was observed that the thinking patterns of the stakeholders have shifted from organization centric perspective towards a network-based perception. Therefore, it is the responsibility of the company to balance these multiple interests. However, it implies that any organization will not always be at the center of the stakeholders' interests (Olkkonen & Luoma-aho, 2011). But the stakeholders could also form relations among other stakeholders and enhance their power. This further identified that the mutualism among the stakeholders' construct towards a delicate matter where the organization needs to fit their position accurately and gain support (Fleming & Kowalsky, 2024). But it is quite challenging for the organization since these could be changed, however, and whenever the attitudes, expectations and values of the stakeholders differ. ITC provides data to their stakeholders through reports and certifications in communicating their performance and integrity. By proving the needs of the clients continuously both parties are meeting their sustainability goals and branding too. In this scenario, Stora Enso, have open dialogues, forums and regular surveys in understanding their needs and expectations.

Trust among the stakeholders is vital. They believe that the stakeholders will perform their respective role's reliably and effectively. In addition, they do believe their interests are considered and will act upon those. These are applicable in both dimensions (Ghondaghsaz & Engesser, 2021). Thus, transparency provides many outcomes which enhance relationship building. When companies are transparent about making their decisions and in addition, act upon their operations, it automatically adds accountability where it is possible. Therefore, both the internal and external stakeholders have the advantage of seeing where the responsibility is held. When transparency improves, the accountability of the stakeholders increases as well. (Baah et al., 2021). The sense of knowing the fact that what both parties have agreed upon is actually happening will enhance both corporation and trust. ITC is occupied with high standards, compliance and ethics while communicating to the respective stakeholders. Further, by publishing the reports on a yearly basis, and measuring the progress through environmentally sustainable goals (ESG), it has enhanced the level of trust among the stakeholders. ITC also incorporates the decision provided by their stakeholders, that in turn enhances trust and respect. However, in the view of Jahansoozi (2006), it was observed that being accountable will not merely enhance trust, yet the corporation among the company and the industry also plays a significant role. The same is true with Stora Enso, where it has open communications with their stakeholders and identifies trends and concerns. Mainly their sustainability priorities are aligned with direct stakeholder input.

Different stakeholders have different views and ideas about the business world. In terms of sustainability practices, every stakeholder places contrasting weightage among these green adaptations. Above all, the interest of stakeholders is bound to be different and complicated. However, the challenge is to collaborate among the stakeholders in making decisions and balance among everyone's view (Capolongo et al., 2019). In the article of Marttunen et al. (2017), it was identified that involving stakeholders will add knowledge and values to the decisions, enhancing trust, and mitigate the conflicts with high-cost efficiency. However, time consumption and raising unrealistic expectations will bring down the trust of the company itself. Through formal and informal platforms ITC is incorporating their stakeholders' ideas. ITC believes that their brand and reputation will be impacted negatively if they are unable to meet the expectations of the stakeholders. ITC also believes that effective communication and involvement of stakeholders will find issues in relation to ITC products. Stakeholders play a pivotal role in the agenda of Stora Enso. Along with the annual reviews, customers and other stakeholders provide feedback in terms of sustainability. This aids the company to drive at its best in sustainable performance.

2.3. The Interrelationship Between Stakeholder Engagement Strategies and GRL Implementations

Most companies operating in the P&P industry, have adopted GRL practices as a reactive mechanism or a proactive mechanism. In the view of González-Benito and González-Benito (2006), it was identified that a reactive mechanism is followed when the laws and regulations are input by the government. Thus, the companies are moving forward in GRL practices to avoid or mitigate the fines imposed by these regulations for not adhering to these regulations. On the other hand, proactive mechanism moves one step further by adding an extra mile towards the business as of a voluntary basis in bringing green initiatives with a intention of reducing negative impacts and enhancing the brand reputations. However, these decisions are mostly incorporated with the stakeholders (Kim & Lee, 2012). On the other hand, the internal stakeholders who have a much in-depth influence over the companies are likely to influence upon the considerations of the financial capabilities. Yet the board of directors are unable to gratify all the needs of every stakeholder. Therefore, it can be observed that stakeholder pressure is influenced upon the GRL practices. To balance the influence, the company needs to adopt these mechanisms by engaging them into the business.

Most importantly weighing the stakeholders as per the importance and identifying their needs in respect to the group will reduce the challenges in catering for their needs. Different stakeholders might have different views upon GRL practices (Ahmad & Xu, 2021). Community pressure might push the companies towards these adaptations, yet the internal stakeholder might have the eye on the financial capacity of the business. However, this depends on the awareness level of the stakeholders at each level (Baz & Laguir, 2017). On the other hand, the final receiver of the products of the company, the consumer, plays a pivotal role. They are known to be key actors. Mostly their

intentions and awareness towards GRL practices will improve the environmental performance as well as the final outcome of the company, the sales and revenue (Huge-Brodin et al., 2020). However, even though consumers have high expectations, yet they are not willing to pay the extra amount for the products in purchasing towards better sustainability.

Adopting GRL practices involves a vast number of changes within the organizations and among the supply chains. Thus, internal management as well as external collaborations are impacted. The involvement of multiple stakeholders can impact these decisions positively. Enhancing awareness about these adaptations and the importance of those steps is crucial. Some companies are incorporating training and development programs (Evangelista et al., 2018). However, the consistent support from the internal parties is greatly impacted. In addition, the suppliers and consumers also impact externally. Thus, these collaborations should be made under solid strategies since involvement of many stakeholders might also act negatively towards the progress of the organization. It the article of Prataviera et al. (2023), it was observed that stakeholder’s engagement has a positive impact upon the adoption of GRL practices. However, companies are still prioritizing the economic elements above the GRL adaptations but having the structured stakeholder engagement mechanisms will help the organizations to not only operate towards the economic benefits and the institutional pressure yet concurrently work upon the supply chain and other external stakeholders.

Based on the above literature review, the theoretical framework was developed as illustrated in Figure 1.

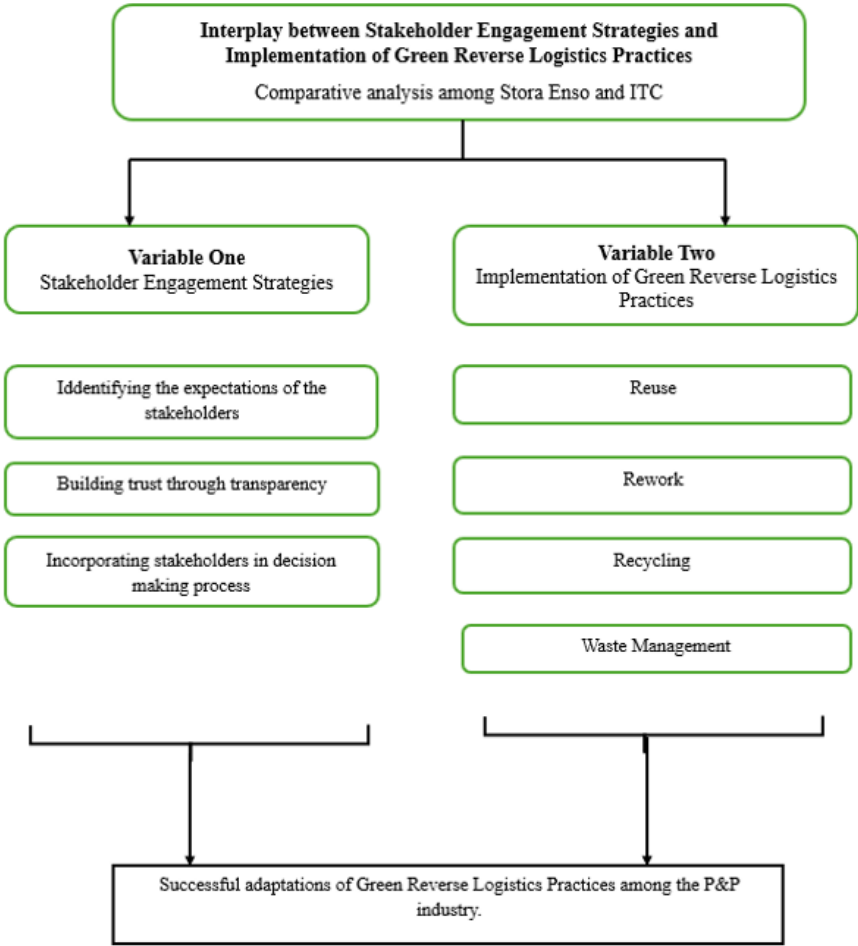


Figure 1. Theoretical Framework.

3. Research Methodology

In this study, the authors have selected a positivism philosophy where the knowledge has been gathered through observations and analysis (Gamage, 2025). This is followed through a deductive approach that the study begins with a general theory derived from literature and later applies empirical research (Haque, 2022). Thus, the authors have chosen pre-existing theories in examining the stakeholder engagement strategies and GRL practices. Based upon the secondary data the study follows a qualitative approach along with annual reports, industry publications and sustainability reports that provide an in-depth understanding of the variables (Busetto et al., 2020). Data analysis is under two-fold methods. One is the thematic analysis in identifying the themes and patterns and flexible methods in examining the data. Secondly the comparative analysis, where the authors identify the differences and similarities of the two chosen companies. The themes identified within the two variables are provided in the thematic analysis below.

Objectives	Elements
Objective One: To identify the key stakeholder strategies and practices implemented by Stora Enso and ITC.	1. Identify the expectations of the stakeholders 2. Building trust through transparency 3. Incorporating stakeholders in decision making process
Objective Two: Recognizing the key green reverse logistics practices adopted by Stora Enso and ITC.	1. Reuse 2. Rework 3. Recycle 4. Waste Management
Objective 03: Critically analyzing the relationship between Stakeholder Engagement Strategies And Implementation of Green Reverse Logistics Practices in Stora Enso and ITC	Positive Relationship

Figure 2. Key elements in demonstrating the Thematic Analysis.

3.1. Research Scope

The study focused on two leading players in the printing and packaging supply network. The data was collected through reliable journals and collaboration reports from their respective websites. The study identifies different practices in stakeholder engagement strategies and GRL elements by Stora Enso and ITC. The research analyses the relationship between the two variables and provides practical and impactful insights that would further strengthen the GRL practices and engagement practices. The diagram below provides a pictorial illustration of the scope of the study.

Interplay between Stakeholder Engagement Strategies and Implementation of Green Reverse Logistics Practices

Comparative analysis of Stora Enso and ITC

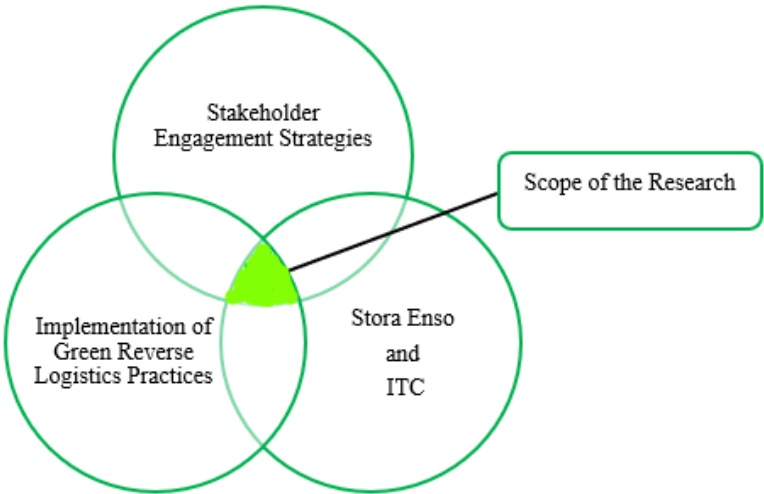


Figure 3. Scope of the research.

4. Results and Discussion

4.1. GRL Practices Observed in Stora Enso and ITC

When evaluating the GRL practices implemented by Stora Enso and ITC it was identified that both companies have adopted similar practices. Waste management, recycling, reuse and rework (Pushpamali et al., 2019; Sengupta et al., 2023; Sonar et al., 2024) were among them.

Both companies are engaging in sustainable waste management. In Stora Enso, it is targeted for 100% recyclability whereas now it is at the rate of 94%. Waste management can be drastically reduced through reuse (Schützenhofer et al., 2022). Thus, Stora Enso is moving along with many reusing strategies by reducing the amount of waste sent into landfills. Setting up waste management targets and achieving nearly 99% above the target level is now adhered to on a voluntary basis. In the view of ITC, they are more focused upon going towards the collection centers and collecting all the used packages and products and then move forward with the recycling. As of today, ITC was able to collect 76,000 tons of plastic packaging waste amounting to more than 99% of waste. This in turn reduces waste management. In India, waste generations have been increased drastically. Thus,

ITC is incorporating sustainable waste management through a continuous monitoring system and utilizing the waste efficiently has aided enormously. With the comparison of both companies the authors believe that Stora Enso is proving strong, yet ITC is having a much more powerful model where it aligns with moving in with community centers and collecting all the materials from scratch, proving with the extended producer responsibility while moving towards the sustainability practice.

Eliminated components might still have some value, that could be regained by recycling (Wu, 2022). Both companies are competitively using the recycling approach under GRL practices. Stora Enso is aiming to move forward with 100% recyclability by 2030 and the full capacity by 2050. Currently it stands at 1.3 million tons of paper towards recycling. The company is focused upon fiber-based packaging while enhancing the lifetime of those packages under industrial scale. However, this raises the question of having limited engagement towards a fiber based product. On the flip side, yet these proactive practices have reduced the use of virgin materials while increasing product sustainability. In terms of ITC, it is moving with the communitybased system and has incorporated the closed loop system. The Well Being Out of Waste (WOW) initiative has promoted recycling opportunities in urban communities. However, both companies have their own specialties where Stora Enso is more weighted towards fiber based and ITC is plastic waste recycling practices.

The Reuse element in GRL practices is more focused through packaging by both companies. 100% reusable and compostable packages are target by 2030 in ITC. This is turned to reducing the amount of waste drastically. Corrugated boxes, durable cartons have enabled them to use the same box for multiple cycles within the transportation. This has been extended towards “Less Plastic and No Plastic” initiatives, where the packages are aligned with multi-use-pouches and containers that can be refilled. In Stora Enso, fibers are reused multiple times. More focused upon reused packages under business to business (B2B) settings and reused water among the mills and reducing waste. However, ITC is having an extensive program for reuse strategies from community based.

Reworking is reducing the material consumption. Stora Enso and ITC are both reworking and engaged in reworking strategies. Within their internal operations if they had an error on any materials under off specifications, they recover the massive loss by reworking. This reduces waste. However, one could argue that it is repeat work and might impact upon material and energy usage. On the other hand, the amount of energy and material used in repetition is far less than the amount of those resources wasted if not reused. However, in comparison to both companies Stora Enso is more focused upon fiber materials among the industrial oriented, whereas ITC is recovering materials from the community level itself.

4.2. Stakeholder Engagement Strategies Implemented in Stora Enso and ITC

In the context of stakeholder engagement strategies, both are using strategies to meet the stakeholder expectations, involving them towards decision making and building trust through transparency. These mechanisms have helped both brands in having a solid relationship with the stakeholders while initiating sustainability goals.

Both companies are meeting stakeholders’ expectations under different levels. Identifying the stakeholders accordingly and focusing on meeting their needs is essential. ITC follows the TBL model where they believe that meeting their expectations is creating a large societal value. The relationships are fostering with completeness, materiality and responsiveness. Through general meetings to other collaborative societal activities the identification of their needs is approached. ITC communicates all their negative, positive, actual and potential impacts in every field that would enhance these strategies. On the other hand, Stora Enso believes that providing high quality is the solid foundation for their brand reputation. Visibility towards their sustainability road map, delivering the key commitments, and strong community services are the engagement strategies Stora Enso compiled with.

The successful application of green initiatives depends on their stakeholders because these involvements are creating and linking collaboration among the key players in every organization (Ghisellini et al., 2015). Building trust is a fragile but important aspect. Having annual double materiality assessments is creating a relationship among them with trust. The leadership team and the board of directors annually receive updates as to how the organization is impacted financially by environmental and social impact and how the operations of the Stora Enso have impacted upon the environmental and social aspect. When these issues are addressed, the trust builds up. The same is followed by ITC where they identify directly and indirectly impacting and influencing the business operations, and due weight is given to the stakeholders upon the engagement level, followed by prioritizing the needs and concerns while addressing those needs in a consistent manner in order to be transparent. Having these solid strategies will impact trust and transparency positively.

Actively engaging stakeholders in decisions making has improved the validity of those decisions (Fleming & Kowalsky, 2024). Stora Enso has prioritized employee engagements and has regular forums and has aided in collecting different perspectives and insights that help the group to improve. Suppliers have also been consulted by providing their input and views mainly on safety-related concerns. Regular training, discussions and on-site activities have positively impacted on their sustainability developments. ITC has forums and materiality assessments where the said issues and matters are carefully assessed and the strategic decisions are guided accordingly. Most importantly, the CSR activities as vocational training have provided insightful decisions upon other initiatives through local communities.

4.3. Interplay Between Stora Enso and ITC of Stakeholder Engagement Strategies and Implementation of GRL Practices

It was evident that by referring to the company reports and the existing literature both companies are following structured and well-balanced mechanisms in following the GRL practices through the stakeholder engagement strategies too. It was found in the literature Prataiviera et al. (2023), that the adaptation of GRL practices has an influence upon the stakeholder. But through the company data, it was clear that by having the right and balanced strategies the GRL practices are impacted positively. Stora Enso and ITC both use the rework element where if the products are off the specifications they take them back to the production cycle without

wasting the materials that they used. Reusing the water in the mills is saving water enormously in ITC. Stora Enso takes full responsibility that the packaging materials for logistics under B2B are completely reused. In addition, Stora Enso has emphasized highly upon fiber based and the following of the Closed loop is safeguarding the materials and reusing the same without harming the virgin materials. ITC has enhanced the recycling process toward the local people, where they have extended their value to those households by taking the waste and recycling that to make energy. In the view of Arokiaraj et al. (2019), it was observed that recycling, rework and reuse has a positive impact on reducing waste, that in turn enhances the environmental performance.

Stora Enso has collaborated stakeholder views and ideas through double materiality assessments where the top managers assess how the sustainability goals are affecting financial stability and in addition how the operations of the companies are affecting the environment and society. However, ITC is using the TBL strategy to integrate GRL toward societal values, such as putting up recycling centers, WOW initiatives and waste collection points in the communities. Therefore, it was found that ITC has extended their responsibilities as producers while including the valuable expectations of the stakeholders. In encouraging the participation of the stakeholders in their decision-making processes, ITC has found active methods in playing a part in the engagement programs. ITC is not only involving their perceptions, yet the stakeholders are engaged in their role of GRL activities. From the Stora Enso view, having forums that include suppliers, and employees help in having ideas about reuse and recycling mechanisms. Both companies are using reports to provide what their operations are and how they have performed them. This has encouraged their stakeholders, and it has resulted in building trust among them. The engagement of stakeholders in the decision-making process has also improved the actions taken by the companies. Materiality assessments guide as well as the forums in ITC and Stora Enso respectively have resulted positive. However, in the literature of Shibayama et al. (2020), it was argued that engaging in the participation of decision making could lead towards high cost and time consumption. Thus, it is the responsibility of both companies to keep the balance in accepting and respecting their perceptions while being alert about the time and the cost. Both companies are welcoming feedback from the stakeholders. ITC is moving on with the community where it has seen and heard of their needs and expectations. Compostable packaging is one of the innovative ideas they have considered from the community itself. While Stora Enso, is following a structured mechanism that has been proven in achieving 100% recyclability. These have been supported by the stakeholders.

In light of the evidence gathered, it proves that ITC and Stora Enso are both following stakeholder engagement strategies while enhancing and improving the GRL practices. On the other hand, it was observed that the two companies have different strategies in engaging stakeholders.

4.4. Summary of the Comparative Analysis

In summing up, the comparative analysis cumulative shows that both companies have their best structured models in enhancing the stakeholder engagement strategies. Both companies are playing a significant role in their own culture. Stora Enso has a structured and strong way in line with the ESG framework and integration of the forest-sector where they guard and value the forests. However, ITC is having more of a local and community responsiveness where they are involved in moving into the community and understanding the needs. Collective value is created among the stakeholders by bringing them together and moving towards achieving sustainability goals. Bridging the gaps identified among the two companies will strengthen the adoption of GRL practices. Further, the learning from each company reveals that the practical procedures each could follow in strengthening the stakeholder engagement. Balancing these two variables will improve the overall business operations towards sustainability.

5. Conclusion

The study proves that both companies have adopted strong stakeholder engagement strategies in adopting GRL practices into their operations. Above all the most salient finding in the study was that ITC is following a top-down and bottom-up approach in decision making where it is grounded by its practicality. However, Stora Enso is following a structured and corporate based mechanism. Stakeholder engagement strategies as of trust and transparency, identifying their needs and involving the stakeholder in decision making has positively enhanced the adaptations of GRL practices covering recycling, reuse, rework and waste management. Application of the stakeholder theory and CLSC theory has emphasized that those stakeholder engagement strategies are acting as a proactive mechanism in bringing and developing GRL practices. Empirical evidence proved that such GRL practices are improving with actual communication with the stakeholders and their valid inputs. The collaboration of these active roles is essential, and it empowers in identifying critical points within the implementations. Ultimately, these strategies are essential towards achieving their sustainable goals along with a well-balanced work environment. Government intervention and laws and regulations could bring some control over the GRL practices, yet the adaptations lie along with the company itself where these decisions need more validity and practicality while building resilient sustainability business in the long run.

5.1. Recommendations

The most suitable GRL practices are recycling, reuse and waste management. On the flip side, these adaptations could be strengthened more by introducing accurate strategies in engaging stakeholders among business operations. Both companies can adopt ways to publish actual achievements among reverse logistics and further show how the stakeholder participation helped in evolving these mechanisms. They should reduce the knowledge gap of reverse logistics and have community forums in providing how these mechanisms work among the community leaders, logistics partners and recyclers. In addition, increase the efficiency level of waste collection points and educate them upon the recycling methods. Expanding the recycling capacities by providing financial support and reducing the technological challenges. These improvements could be made in every recycling point and will make them more efficient and effective. Collaboration among the same industry would expand these technical innovations and a comprehensive oversight is created in GRL operations. Government could provide incentives and loans for these amalgamations.

5.2. Implications and Limitations

It is evident that implementations or improving the GRL practices can provide an extensive competitive advantage towards the company. Enhancing brand visibility among the stakeholders is achieved while increasing commitment towards sustainable initiatives. It is no doubt that the world is moving towards sustainable initiatives; thus, it is crucial for the P&P companies to adopt these mechanisms and be more responsible towards the society and the environment. However, the research is based upon secondary data where more extensive research could be brought forward by accompanying primary data in refining the preliminary findings in the current study.

The P&P industry requires the corporation from all levels in stakeholders in adopting GRL practices. The most critical points of manufacturers to consumers need education and support in understanding the real reason among these initiatives. Stakeholders are aware of these environmentally friendly processes and products. Thus, commitment is needed from the company's perspective to engage them to implement GRL practices and balance off the needs of society, economy and the environment too.

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Appendix 1. Comparative Analysis

Objectives	Element	Stora Enso	ITC	Commonalities
Stakeholder Engagement strategies	Understanding the expectations of the stakeholders	Focused more upon double materiality approach, where the top management assesses how sustainability matters to the financial performance and how business operations matter to the sustainability under TBL	Moving on with the locals, meeting them personally through community hubs.	Both companies are engaged in meeting their expectations but follow in different angles.
	Building trust through transparency	Focused upon collaborating with the annual reports along with sustainability reports, Sustainability Accounting Standards Board (SASB) mapping their "Containers and Packaging" and "Forest Management". Thus, stakeholders have a clear picture of the actual performances.	Providing sustainability reports, achieving the highest score in following the best environmental practices under water security and climate actions. Stakeholders are able to track down the sustainability credentials and provide ideas and feedback.	Focused deeply on building trust
	Incorporating stakeholders in decision making process	Having forums where feedback is welcome	ITC collaborates with the stakeholders under operational and community levels. Their local partnerships (village entrepreneurs, rainwater harvesting groups) are involved in making decisions	Both integrate stakeholders deeply into making decisions
		Bound by the Finnish Companies Act where it clearly identifies the board is accountable in inputting stakeholder ideas.	Under Indian Law and regulatory framework, the stakeholder concerns and ideas should be incorporated under Sustainability Reporting.	
Green Reverse Logistics Practices	Reuse	Reuse is mainly among industrial supply chains	Reusing at the community level. Focusing upon neutralizing the usage of plastic while integrating extending the producer responsibilities.	Use of Reuse element
		Focus more upon Fiber based packaging where it significantly reduces the use of plastics		
	Recycle	Recycling board waste and paper and make new packages for products, Reusing water and energy in mills.	Collecting plastic from community centers	Strongly focused and monitored in recycling activities
		Recycled fiber is used as their main input in production		
			Household waste is recycled	
	Rework	If the standards are not met, rework is done and then put back into the production cycle.	Producing recyclables packaging for FMCG	Both are strongly working on rework elements but with different extremes.
			If there are any off specifications shared them back to the recycling unit.	
		Water is reused after treating them properly used under paper production	Collected plastic waste is reworked into a material as recycled granules (Solid plastic powder).	
		If the packaging is done under off specifications, it will be reprocessed and put back to the pulp or recycled.		
	Waste Management	Collecting waste from mills as pulp, and packaging and paper production	Collection of plastic and then the separation of the plastic waste towards recycling.	
		Hoping for the Zero landfill by 2050	Partnering with municipal councils and segregation of waste	
		Waste as bark of trees and lignin are turned into bio compost or adhesives	Energy is created through waste	

Appendix 2. Thematic Analysis.

Key themes	Stora Enso	ITC	References
1. Sustainable Waste Management	Targets 100% recyclability (currently 94%), voluntary waste reduction, reuse strategies.	Community-based collection centers, 76,000 tons of plastic waste collected, extended producer responsibility.	Pushpamali et al., 2019 Sengupta et al., 2023 Sonar et al., 2024 Efficient resource use and circularity: Stora Enso Sustainability – Efficient Resource Use [storaenso.com] ISO 14001-certified waste management systems: Stora Enso Waste Management [tracenable.com]
2. Recycling Practices	Fiber-based packaging, 1.3 million tons recycled, goal of 100% recyclability by 2030.	WOW initiative, closed-loop systems, urban community engagement.	Circular bioeconomy and fiber-based packaging: Stora Enso Circularity [storaenso.com] Research on recycling systems: Packaging Europe – Stora Enso [packagingeurope.com] Wu, 2022
3. Reuse Strategies	Reuse of fibers and water in mills, B2B packaging reuse.	Compostable packaging, multi-use containers, “Less Plastic and No Plastic” initiatives.	Reuse of materials and wastewater: Stora Enso Efficient Resource Use [storaenso.com] Consumer perceptions of reusable packaging: Packaging Insights – Stora Enso [packaging...sights.com] Schützenhofer et al., 2022
4. Rework Strategies	Both companies rework off-spec materials to reduce waste. Industrial fiber focus.	Both companies rework off-spec materials to reduce waste. Community-level material recovery.	Circular bioeconomy and fiber recovery: Stora Enso Strategy [storaenso.com] Pushpamali et al., 2019 Sengupta et al., 2023
5. Stakeholder Engagement	ESG framework, double materiality assessments, employee and supplier forums.	TBL model, CSR activities, community responsiveness, materiality assessments.	Stakeholder relations and materiality assessments: Stora Enso Stakeholder Relations [storaenso.com] Engagement and collaboration with NGOs and policymakers: Stora Enso Engagement [storaenso.com] Ghisellini et al., 2015 Fleming & Kowalsky, 2024