WWW.IJRPR.COM

**International Journal of Research Publication and Reviews**

Journal homepage: www.ijrpr.com ISSN 2582-7421

# Green Innovation and Stakeholders' Pressure: Evidence from the Green Apparel Sector in Sri Lanka

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**A B S T R A C T**

Stakeholder pressure is the key factor in motivating organizations to follow green innovation. Thus, it is important to understand the factors influencing green apparel organizations' intentions to adopt green innovations. This paper aims to investigate the impact of stakeholders' pressure (consumers' pressure, competitors' pressure, and regulatory pressure) on green innovation in the Sri Lankan green apparel sector. The survey method was used. A self-administration questionnaire and a simple random sampling technique were used to collect the data. Data was analyzed using smart PLS and SPSS 22. The results revealed that stakeholders' pressure and competitors' pressures have a significant positive impact on green innovation. However, in green apparel organizations, there is no significant impact of customer pressure and regulatory pressure on green innovations. This paper theoretically supports the in-depth analysis of the literature on Sri Lankan green apparel organizations and guides the managers about the factors influencing organizations' intentions to adopt green innovations in green apparel organizations.

Keywords: Competitors Pressure, Customer Pressure, Green Apparel Sector, Green Innovation, Regulatory Pressure, Stakeholders' Pressure.

## 1. Introduction

With environmental awareness of the community, environmental practices are the key concern of the stakeholders. Stakeholders are individuals or groups of people that both impact and are impacted by a company's operations and decisions. Some scholars consider stakeholder pressure as customer, competitor, and regulatory pressure [1]. Past literature suggests that stakeholder pressure is the main factor to motivate firms to follow green innovation [2] [3] [4]. Others found that regulatory pressure positively relates to green innovation [5]. Similarly, firms may not implement innovative environmental practices if they do not feel pressure from clients [6]. Some scholars disclose that regulatory stakeholder pressure is positively related to types of environmental proactivity [7].

Green innovation has become a strategic path to address the environmental concerns of organizations. Green innovation denotes new or modified products and processes, including technology, managerial methods, and organizational innovations, which help sustain the surrounding environment [8]. Some scholars mention that green innovation contains green product innovation and process innovation [9], while others include managerial innovation as a key dimension [10].

As a most important industry, apparel organizations have considerable concerns regarding energy consumption and environmental pollution. As human attention on environmental protection grows, it is important to introduce green innovations to handle the environmental issues and economic success of green apparel organizations. Green apparel refers to clothing designed for durability, ethically produced, environmentally friendly, and made from eco-labeled or recycled materials [11]. This study focuses on the green apparel sector, which is the key export revenue earner in Sri Lanka. The apparel sector is one of the world's largest providers of numerous negative environmental results. As the second most pollution-releasing sector globally, it produces about 10% of the world's carbon emissions [12]. However, there are no studies focused on the stakeholders' pressure and green innovation in the green apparel sector, especially in the Sri Lankan context. Though some studies show a positive relationship between stakeholders' pressure on green innovation [13] studies related to different industries and countries have not found a positive relationship between these two variables [14]. With specific government environmental regulations, regulatory pressure becomes a key driving force for firms pursuing green initiatives [5] [15]. However, [16] and [17] found that regulatory pressure does not significantly impact environmental innovations. These inconsistent results suggest that the impact of regulatory pressure and customer pressure on green innovation is still unclear. It is need to fill in this gap in the green innovation literature. On the other hand, as an influencing factor, some stakeholders are more important than other stakeholders in different industries and contexts. Accordingly, it is important to understand the factors influencing green apparel organizations' intentions to adopt green innovations before implementing any practical measures. Moreover, past research found that the field of green innovation lacks sufficient scholarly attention, despite being an emerging area, especially in Sri Lanka [43] [44]. To

fill the above gaps, this paper aims to investigate the impact of stakeholders' pressure (consumers' pressure, competitors' pressure, and regulatory pressure) on green innovation in the Sri Lankan green apparel sector.

The structure of this paper begins with the introduction. The second part reviews existing literature on stakeholders' pressure and green innovation. The third section is about the research 4u76methodology. The fourth and fifth sections are about results and discussion, next sections present the conclusion, and recommendations, respectively.

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## 2. Literature Review

### *2.1 Green Innovation*

Green innovation may lead toward a "win-win situation" since they can both increase economic benefits and lessen pollution. Green innovation is defined as hardware or software-related innovations in green products or processes [18]. Green innovation is defined as new or modified products and processes, including technology, managerial, and organizational innovations, which help sustain the surrounding environment [8]. Further, green innovation is a subclass of innovation associated with green products or processes, marketing techniques, organizational structures and systems or technologies that improve not only environmental performance but also the economic performance of innovators [19]. Green innovation consists of unique or altered systems, processes, products, and practices that provide an advantage to the environment and subsidize firms' sustainability [20].

While some authors stated that green innovation contained green product innovation and green process innovation [9], others also mentioned the role of managerial innovation [10]. Green product innovation denotes the development of a new product or service that has less or no negative impact on the environment, or with less harmful compared to existing or competitors' products [21]. Green process innovation is identified as enhancing existing production methods and applying environmentally friendly technologies to produce goods and deliver services with little to no negative impact on the environment [21]. Managerial innovation involves the establishing of green objectives and strategies for achieving green innovation as aligned with daily operations and a specific budget for green innovative thinking [22].

### *2.2 Stakeholders' Pressure*

Stakeholders are individuals or groups who influence a firm's operations and decisions and are also affected by the firm's decisions [23]. Stakeholders are classified into four groups as regulatory stakeholders (governments, trade associations, informal networks, and competitors), organizational stakeholders (customers, suppliers, employees, and shareholders), community stakeholders (community groups, environmental organizations, and other potential lobbies), and the media [24]. Some scholars have identified stakeholders as customers, regulatory bodies and governments, competitors, media and special interest groups as the stakeholders [25]. Other studies have employed institutional theory to examine green innovation and identified the three institutional pressures: customer, regulatory, and competitive [26]. Stakeholders' pressure, organizational support, and societal expectations were significant factors for the motivation to adopt GI practices and corporate environmental responsibility [2] Stakeholder theorists suggest that stakeholder pressures act as the major driver of firms' motivations to follow green innovation [2] [3] [4] [27]. Hence, H1 was established based on this background,

H1: *Stakeholders' pressure has a significant positive impact on the intentions to adopt green innovation for Green apparel companies in Sri Lanka.*

Table 1 presents different dimensions which are used by the prior researcher in their study. Among them, competitive pressure, customer pressure, and regulatory pressure are commonly used. The present study also uses these three dimensions to measure the stakeholder's perspective.

***Table 1 Dimensions of Stakeholders' Pressure***

| Year | Author/s | Study topic | Dimension |
|---|---|---|---|
| 2018 | [28] | The drivers of eco-innovation and its impact on performance: Evidence from China | • Competitive pressure |
| 2016 | [29] | The driving forces of process eco-innovation and its impact on performance: insights from Slovenia | • customer demand<br>• Competition |

| | | | |
|---|---|---|---|
| 2018 | [1] | Institutional theory and environmental pressures: The moderating effect of market uncertainty on innovation and firm performance. | • Regulatory pressure<br>• Customer pressure<br>• Competitive pressure |
| 2021 | [27] | Green Innovation Practices and Its Impacts on Environmental and Organizational Performance | • Competitor Pressure<br>• Government Pressure<br>• Employees Conduct |
| 2011 | [30] | Determinants of Green Practice Adoption for Logistics Companies in China | • Customer pressure<br>• Regulatory pressure |

Source: Compilation by researchers based on the literature 2025

### *2.3 Consumer Pressure*

Consumer pressure is defined as the extent to which consumers expect or pressure firms to improve their environmental performance [23]. With increasing concern from customers about environmental issues, customer pressure become a prominent driver in establishing green innovation practices. As prior literature suggests, consumer pressure plays a key role in green product innovation than regulation pressure [23]. Similarly, other scholars found that firms may not implement innovative environmental practices if they do not feel pressure from clients [31]. Further, they explain that under institutional pressures, the stakeholders motivate firms to adopt positive environmental practices, adjust their business models, and reallocate their resources. However, customer demand is not a strong driver of green product innovations, since eco-friendly products are more expensive than normal products [32]. Some scholars found that customer pressure did not affect green innovation [30]. Nevertheless theoretically, the stakeholder theory and the institutional theory both provide theoretical support for the positive driving effect of customer pressure on green innovation [26]. Hence, this study suggests H1a.

H1a: *Customer pressure has a significant positive impact on the intentions to adopt green innovation for Green apparel companies in Sri Lanka.*

### *2.4 Regulatory Pressure*

With specific government environmental regulations, regulatory pressure becomes a key driving force for firms pursuing green initiatives [5] [15]. In some cases regulatory pressure is positively related to green innovation [5] [30]. The same findings indicate the study of Viraldo and Frey (2011) and it also reveals that under higher regulation pressure, firms are more willing to increase their investment in green innovation to improve their energy efficiency and decrease their environmental impact [cited in 23]. Further, formal and informal environmental regulations and pressures have strong influences on green innovation activities in food-making companies [33]. Thus, H1b is established:

H1b: *Regulatory pressure has a significant positive impact on the intentions to adopt green innovation for Green apparel companies in Sri Lanka.*

### *2.5 Competitors Pressure*

Further, firms need to be alert about their competitor's products/services, actions, and norms regarding green practices in order to gain competitiveness. In the study of 442 Chinese firms, competitors' pressure provides organizations with more significant incentives to adopt green innovation practices [22]. Based on survey data obtained from 165 3PL providers in China, the empirical results suggest customer pressure and competitive pressure significantly compel 3PL providers to adopt a green innovation, while to this point, regulatory pressure has not affected such innovation [26]. Thus, H1c was established as follows.

H1c: *Competitors' pressure has a significant positive impact on the intentions to adopt green innovation for Green apparel companies in Sri Lanka.*

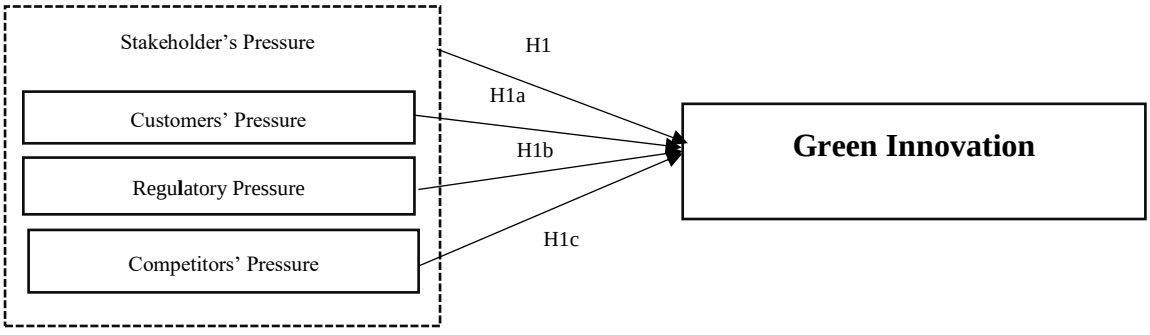


**Figure 1 The Theoretical Model**

## 3. Methodology

### *3.1 Measurement of constructs*

Measurement scales from the previously validated research were used in this study and some changes were made to fit into the Sri Lankan context. The questionnaire was in English language. Wordings of the measurement scales were modified according to the expert idea. All of the construct's items were measured using "five-point Likert scales in which 1 = strongly disagree, 5 = strongly agree." A survey method was used. A self-administration questionnaire was used to collect data. Mainly, the researchers wanted to get anonymous answers from the respondents, and the respondents were allowed to fill out the questionnaire without any influence. For this purpose questionnaire was distributed at one time and collected later to give enough time to fill it. As a result of the pilot study, it will be able to identify lower loadings against each latent construct and remove them to improve the internal consistency among data and the validity of study constructs. Table 2 presents the operationalization of stakeholders' pressure.

***Table 2 Operationalization of Stakeholders' Pressure***

| Construct | Dimension | Statement | Source/s | Measurement scale |
|---|---|---|---|---|
| Stakeholders' Pressure | Competitor Pressure | (1) The company feels pressure from competitors' environmental practices. | [26] | 5 point Likert scale |
| | | (2) Our main competitors that have adopted green innovations have become more competitive. | | |
| | | (3) Our major competitors set worldwide environmental standards for their operations and products. | | |
| | | (4) Our main competitors that have adopted environmental practices have benefited greatly. | | |
| | customer pressure | (5) The company feels pressure from customers' environmental awareness. | | |
| | | (6) The company feels pressure regarding building a green reputation. | | |
| | | (7) The company feels pressure from customers regarding environmentally conscious packaging. | | |
| | | (8) If the company does not meet the environmental requirements of major customers, the customers will terminate their contracts. | | |
| | regulatory pressure | (9) The company feels pressure from the central government's environmental policies. | | |
| | | (10) The company feels pressure from a local government's environmental oversight. | | |
| | | (11) The company feels pressure from environmental protection groups. | | |

Authors compilation based on literature (2025)

The study population is managers who were familiar with its environmental practices in the green apparel industry. The unit of analysis was individual. The sampling frame is the Human Resource Information System of green apparel organizations in Sri Lanka. A simple random sampling technique was used to select the data.

It is difficult to calculate the exact population size due to the lack of documented information regarding green apparel firms in Sri Lanka. Cochran (1963) developed a formula to calculate sample size for the unknown population [34]. Therefore, researchers decided to calculate an infinite sample size using that mathematical formula at a confidence level of 95%, a margin of error of 5%, and a population proportion of 323. This study used the partial least squares (PLS) procedure of structural equation modeling using Smart-PLS Version 4.0 and SPSS 22 to measure the research model and demographic information.

## 4. Result and Discussion

### *4.1 Response Rate*

The researcher distributed 323 questionnaires to managers (managers and above positions) who are in the green apparel sector in Sri Lanka. 308 completed questionnaires were returned and among them, 297 were useable for analysis. The effective response rate was 92%. According to the decision criteria of Baruch and Holtom (2008), the acceptable level of response rate in behavioral studies is 52.7% [35]. Thus, the response rate of 92% was accepted as a good level of response.

### *4.2 Non-Response Bias*

Non-response bias, or non-response error, happens when individuals who participate in a survey differ significantly from those who do not, specifically regarding the key variables being studied [36]. The first 10 percent of returned questionnaires were considered as early respondents, and the last 10 percent were considered as late respondents. The results of the independent sample t-test revealed that there were no significant differences in most of the response patterns of early and late respondents, suggesting that non-response bias does not happen.

### *4.3 Profile of Respondents*

**Table 3 Respondents' demographic characteristics.**

| Variable | Demographic characteristics | Frequency | Percentage (%) |
|---|---|---|---|
| Profession of the Responses | Factory Managers | 20 | 7 |
| | General Managers | 18 | 6 |
| | Functional Level Managers | 244 | 82 |
| | CEO | 15 | 5 |
| Experience | less than 5 years | 22 | 7 |
| | 6-10 years | 80 | 27 |
| | 11-15 years | 74 | 26 |
| | 16- 20 years | 81 | 27 |
| | 21-25 years | 40 | 14 |
| Age | below 25 years | 4 | 1 |
| | 26-35 years | 35 | 12 |
| | 36-45 years | 132 | 44 |
| | 46-55 years | 108 | 36 |
| | above 55 years | 18 | 6 |
| Educational Qualification | GCE O/L | 4 | 1 |
| | GCE/AL | 74 | 25 |
| | Degree | 184 | 62 |
| | Post Graduate level | 35 | 12 |

Source: Survey data, 2025

Many responses (82%) to the study have been received from functional-level managers (Table 3). The rest of the respondents are factory managers, CEO, and General Managers. This confirms the quality of the data received for the study. It assumes that respondents have a clear picture and understanding of the green innovations that they perform. It is important to have a good understanding of the study and have enough knowledge, and experience with the study constructs [37]. This confirms that the study results are more accurate with quality data. As mentioned in Table 3, 41% of respondents have more than 16 years of experience in their positions. Further 86% of the respondents are above 36 years old. Both of these provide pieces of evidence about their experience and maturity. Well-experienced and mature respondents can provide more reliable and specific information for the study. As mentioned in Table 3, 74% of the respondents have a degree or postgraduate level qualifications. Well-educated respondents are more aware of green innovation

practices and strategies for gaining a competitive advantage. This confirms that the data collected through the survey have critically addressed the study's objectives. Thus, this demographic information confirms the suitability of the sample to be surveyed in this study and the credibility and validity of the results generated from the study. Figure 2 presents the measurement model of the study.

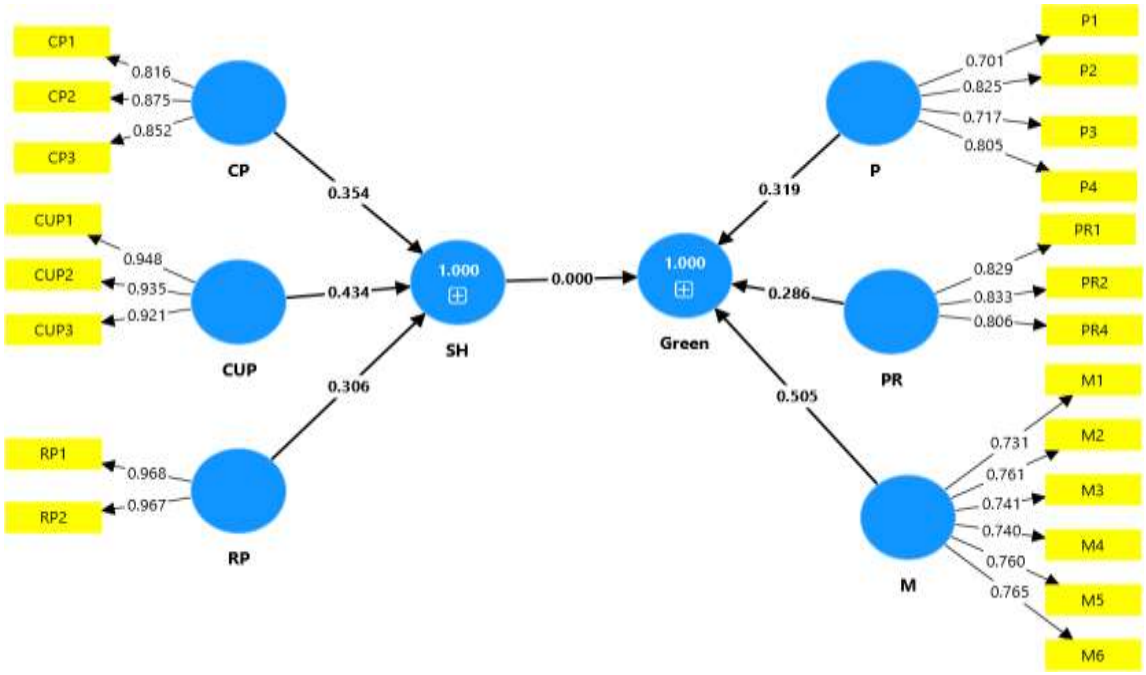


**Figure 2 Measurement Model**

Source: Smart PLS Output, 2025

Each indicator reported more than 0.700 of outer loadings in PLS-SEM. which conceptually meets the reliability standards to measure stakeholders' pressure and green innovation (see Table 4). In the present study, internal consistency was measured using two statistics, namely Cronbach's Alpha and Composite Reliability [38]. Among the two, the most commonly used reliability statistic is coefficient alpha, considering the threshold level of 0.7 as the acceptable level of reliability [38]. Composite reliability further considers whether indicators have different loadings too. As all Cronbach's alpha values and composite reliability values are greater than 0.70, the internal consistency of the measurement model is established (see Table 5).

**Table 4 Indicator Reliability**

| | CP | CUP | M | P | PR | RP |
|---|---|---|---|---|---|---|
| **CP1** | 0.816 | | | | | |
| **CP2** | 0.875 | | | | | |
| **CP3** | 0.852 | | | | | |
| **CUP1** | | 0.948 | | | | |
| **CUP2** | | 0.935 | | | | |
| **CUP3** | | 0.921 | | | | |
| **M1** | | | 0.731 | | | |
| **M2** | | | 0.761 | | | |
| **M3** | | | 0.741 | | | |
| **M4** | | | 0.74 | | | |
| **M5** | | | 0.76 | | | |
| **M6** | | | 0.765 | | | |
| **P1** | | | | 0.701 | | |
| **P2** | | | | 0.825 | | |

| | | | |
|---|---|---|---|
| **P3** | 0.717 | | |
| **P4** | 0.805 | | |
| **PR1** | | 0.829 | |
| **PR2** | | 0.833 | |
| **PR4** | | 0.806 | |
| **RP1** | | | 0.968 |
| **RP2** | | | 0.967 |

**Table 5 Internal Consistency**

| | Cronbach's alpha | Composite reliability (rho_a) | Composite reliability (rho_c) | Average variance extracted (AVE) |
|---|---|---|---|---|
| **CP** | 0.804 | 0.805 | 0.885 | 0.719 |
| **CUP** | 0.928 | 0.928 | 0.954 | 0.874 |
| **M** | 0.844 | 0.844 | 0.885 | 0.562 |
| **P** | 0.761 | 0.773 | 0.848 | 0.584 |
| **PR** | 0.762 | 0.762 | 0.863 | 0.677 |
| **RP** | 0.932 | 0.932 | 0.967 | 0.936 |

### *4.4 Validity*

In the present study, to ensure content validity, the questionnaire was pre-tested by two experts from the field of study. According to their view, there were appropriate modifications incorporated to ensure clarity, relevance, comprehensiveness, and meaning. To ensure face validity the drafted questionnaire was given to two selected experts from the field of research, and checked the questionnaire and fine-tuned it accordingly.

#### *4.4.1 Discriminant Validity*

The inter-constructs HTMT values should be less than 0.90 (HTMT < 0.9) to establish the discriminant validity [39]. The HTMT values lie between 0.90 and 0.85 and are accepted [40]. As the threshold level, the study can examine if the confidence level is 95%, and HTMT is good between 0.90-0.85 [39] (see Table 6).

**Table 6 Heterotrait-Monotrait Ratio**

| | CP | CUP | M | P | PR | RP |
|---|---|---|---|---|---|---|
| **CP** | | | | | | |
| **CUP** | 0.846 | | | | | |
| **M** | 0.435 | 0.23 | | | | |
| **P** | 0.322 | 0.147 | 0.846 | | | |
| **PR** | 0.375 | 0.232 | 0.841 | 0.885 | | |
| **RP** | 0.788 | 0.887 | 0.306 | 0.196 | 0.331 | |

According to Table 7, all inter-construct coefficient values are below the square root of AVE. Thus, the model satisfactorily establishes the discriminant validity.

**Table 7 Fornell and Larcker Criterion**

| | CP | CUP | M | P | PR | RP |
|---|---|---|---|---|---|---|
| **CP** | 0.848 | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **CUP** | 0.734 | 0.935 | | | | |
| **M** | 0.356 | 0.204 | 0.75 | | | |
| **P** | 0.252 | 0.106 | 0.685 | 0.764 | | |
| **PR** | 0.29 | 0.195 | 0.755 | 0.675 | 0.823 | |
| **RP** | 0.685 | 0.825 | 0.271 | 0.171 | 0.278 | 0.967 |

**4.5 Structural Model and Hypotheses Analysis**

Table 8 shows that coefficient values between inner model constructs have positive coefficients ranging from 1.073 to 0.177 where all p-values are less than 0.005 (where $p < 0.005$) except CPU and RP. Here direct relationships with CP and SH green innovation are significant. CPU and RP do not have a significant impact.

**Table 8 Path Coefficients**

| | Hypotheses | Original sample (O) | Sample mean (M) | Standard deviation (STDEV) | T statistics (\|O/STDEV\|) | P values | Result |
|---|---|---|---|---|---|---|---|
| **SH -> Green** | H1 | 0.443 | 0.462 | 0.049 | 8.951 | 0.000 | Supported |
| **CUP -> SH** | H1a | -0.298 | -0.294 | 0.209 | 1.428 | **0.077** | Not-Supported |
| **RP -> SH** | H1b | 0.177 | 0.186 | 0.244 | 0.725 | **0.234** | Not-Supported |
| **CP -> SH** | H1c | 1.073 | 1.040 | 0.189 | 5.683 | 0.000 | Supported |

According to the path coefficient and significance level for the competitors' pressure on green innovation, and stakeholders' pressure on green innovation has a strong path coefficient value ($\beta = 1.073, \beta = 0.443$) where $p = 0.000 < 0.005$. Hence, this result supports hypothesis H1: stakeholders' pressure has a significant positive impact on green innovation, and H1c: competitors' pressure has a significant positive impact on green innovation. Nevertheless, according to the result shown in Table 8 H1a and H1b are not significant where $p > 0.005$.

To address the study's first objectives and the hypothesis of this study, the discussion revolved around the impact of stakeholders' pressure on green innovation. This study adopted the stakeholder's theory to develop the background of stakeholders and green innovation. According to the stakeholder theory, there is a positive relationship between stakeholders' pressures and the adoption of green innovation [41].

Walker et al. (2014) reveal that regulatory stakeholder pressure is positively related to types of environmental proactivity [7]. Moreover, the same findings revealed that regulatory pressure has a significantly positive influence on the adoption of green practices for Chinese logistics companies [30]. Lee (2008) has found that there are positive relationship between firms' environmental activities and government regulatory pressure. However, this study findings contradict these findings. Based on survey data obtained from 165 3PL providers in China, the empirical results suggest customer pressure and competitive pressure significantly compel 3PL providers to adopt a green innovation, while to this point, regulatory pressure has not affected such innovation [26].

In some cases, consumer pressure plays a greater role in green product innovation than regulation pressure and some other cases give evidence that regulation pressure has a greater effect on green process innovation than consumer pressure [23]. However, in this study consumer pressure is not a critical influencing factor to adapt to green innovation. According to the study findings, most influencing factor was competitors' pressure. Moreover, stakeholder theory can be an underlying theory in supporting the connection between the implementation of environmental management practices and organizational performance [11].

Competitor pressure is more critical in Sri Lankan green apparel organizations than other stakeholders' pressure. Thus, these organizations should understand what others are doing regarding the environment. Since customers are more educated and sensitive regarding the environment, applying the green concept to the organizations and getting first mover advantage is long term benefit.

## 5. Conclusion

The results discovered that stakeholders' pressure has a significant positive impact on green innovation. These findings align with the study of [13]. This study's findings provide empirical support for the stakeholder's theory. Moreover, it found that competitors' pressures have a positive significant impact on green innovation. However, in green apparel organizations, there is no significant impact of customer pressure and regulatory pressure on green innovations. These findings are contradicting the findings of some studies [23] [30] [42] and similar to the findings of this study [1].

***Theoretical contribution***

Due to the lack of research on green innovation in Sri Lankan green apparel organizations, this paper is conducive to the in-depth analysis of the literature on Sri Lankan green apparel organizations. Further, this paper tried to find out what factors are most influencing factors for the adoption of green innovation in Sri Lankan green apparel organizations.

***Practical contribution***

With the understanding of stakeholders' pressure on green innovations, managers can make decisions to enhance business sustainability and profitability. This proactive approach ensures long-term success in a rapidly changing global market. Especially, managers who are in green apparel organizations must know what their competitors doing regarding the environment. Understanding this is important as the study result indicated competitive pressure is more crucial than other stakeholders' pressures in green apparel organizations in Sri Lanka. The conclusion of this paper clearly guild the factors influencing organizations' intentions to adopt green innovations in green apparel organizations.

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