



Enhancing Hotel Cost Efficiency and Sustainability- Evaluating the Impact of Durable, Cost-Efficient, and Energy-Saving Bath Linen in Hotel Laundry Operations

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Bachelor of Business Administration - Hospitality & Tourism Experience Management

Thesis

2025.

Abstract

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Degree Bachelor of Business Administration - Hospitality and Tourism Experience Management
Report/Thesis Title Enhancing Hotel Cost Efficiency and Sustainability- Evaluating the Impact of Durable, Cost-Efficient, and Energy-Saving Bath Linen in Hotel Laundry Operations
Number of pages and appendix pages 78 (Thesis) + 13 (Appendix)
<p>The hospitality industry is a large consumer of fabrics, and bath linen is one of the most essential and the most expensive items of hotel operations. Conventional cotton towels can last about 150 washes and therefore have to be replaced very often, which results in accumulation issues and over-laundering. These issues hike the operation expenses and play a crucial role in environmental impact in the form of higher water consumption, energy consumption, and textile waste. The lack of an environmentally friendly and sustainable substitute has, in turn, placed bath linen as a further financial liability to hotels.</p> <p>This paper explores a sustainable alternative, namely, Eco-Bath Linen, a recently developed towel, which is a blend of a cotton pile and a polyester base. The innovation has a lifespan of up to 300 washes, approximately twice that of standard cotton towels, and it requires less water; no piles are formed, and the price is 20 per cent lower than the traditional ones. The study tackles the issue of operational cost and environmental degradation, and at the same time, the comfort and satisfaction of the guests are not compromised.</p> <p>The case study user experience was carried out at Mapakada Village Hotel, in Mahiyanganaya, Sri Lanka, among the staff and guests. The product was tested, and feedback has established that the product is cost-effective, has better performance, and is more comfortable than traditional bath linen. The results indicate that the implementation of Eco-Bath Linen can make the hotel linen management a prototype of sustainable hospitality, where low cost is in line with environmental responsibility.</p> <p>The study makes Eco-Bath Linen a viable solution to the hotel industry, as it integrates the extended life of products, low costs, and environmentally friendly disposal methods, demonstrating both economic and environmental advantages.</p>
Key words Eco-Bath Linen Sustainable Pilling Cotton Polyester Disposal Energy Comfort

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1 Chapter 1 - Introduction

1.1 Introduction

The global hotel industry operates in a landscape where sustainability and operational excellence are two factors that should go hand in hand. Out of the many service operational elements in the hotel industry, bath linens play a significant role in terms of maintaining guest comfort, hygiene, and the service quality of the hotel (Akomaning, 2023). Regardless, this seemingly simple element causes a significant recurring financial commitment while also causing a significant environmental threat due to its frequent disposal. The traditional bath linen is made out of pure woven cotton, which has a relatively short lifespan. The usable period for these bath linen is defined based on the number of washes, and the quality of the traditional bath linen would last up to 150 washes, requiring frequent replacements and resulting a substantial fabric waste. Also, these traditional bath linen consume a large amount of water, and power to wash them, causing further environmental damage (Laitala et.al., 2020.) While this excessive amount of consumption was not considered disturbing once, the hotel industry is gradually converting its operations into a more sustainable one, where the resource consumption for traditional bath linen has raised eyebrows of many environmentalists.

This study was developed in response to the hotel industry's growing demand for sustainable operational solutions for bath linen. The study introduces a cost-effective polyester blend bath linen, evaluating its cost saving and the environmental benefits along with durability, impact on energy efficiency in the hotel industry operations. The subject emerged from the researcher's long-standing professional exposure in the bath linen sourcing industry. Eco Bath Linen was selected for this study based on the researcher's first-hand exposure to the inefficiencies of traditional pure cotton woven bath linen, as a sustainable solution for an alternative, durable, and more eco-friendly bath linen, combined with rising market awareness on sustainability. It is a good alternative for reducing hotel operating expenses and impact on the environment since it offers an extended usable life of up to 300 washes, with zero piling, simple stain removability, shorter drying time, and a lesser water consumption.

This study is relevant and important since it examines a solution for several sustainability concerns in one of the most often used hotel resources. It should be noted that despite experiencing a significant amount of cash outflow on a regular basis, companies have not addressed this sustainability challenge well at present. Like many countries globally, Sri Lanka's hotel sector is under severe pressure to show eco-friendly policies in order to draw environmentally conscious tourists and satisfy changing societal and legal expectations. Eco-Bath Linen offers a chance to completely remake the established bath linen business since hardly any alternative solutions has been introduced to the market that match durability, comfort, and sustainability to this level. While some market participants

like Eco Knit have tried to provide substitutes, these choices usually fall short of both comfort and sustainability. By examining an actual product and assessing realistic findings and outcomes, this study aims to address that gap.

Emphasizing the development of a product followed by pilot testing, the study adopts a product-based thesis approach. To conduct the pilot testing on an exact hotel operational background, Mapakada Village Hotel, Mahiyanganaya, has been selected. The hotel is recognized for its nature-oriented environment and hosts foreign guests on a regular basis, where a batch of sample Eco-Bath Linen is expected to undergo tests under various user conditions, such as wash testing and real user testing. Compared to conventional towels, the research is meant to evaluate Eco-Bath Linen under a few categories, namely, the product durability, ease of use, comfort for consumers, sustainability aspect, and cost effectiveness. During a ninety-day trial, feedback from the Mapakada Village operational team, especially the washing, operations, guest relations, finance, and procurement departments, and a limited number of guests, is expected to be collected to compile feedback. The practical emphasis of the study is expected to significantly contribute to the academic literature and industry practice while evaluating the feasibility of Eco-Bath Linen as a trend-setting, sustainable, and innovative bath linen product to the hospitality sector. The study aims to study the performance of this particular product as the solution for the identified problem areas by starting a more general discussion on circular design, lifespan performance, and environmentally friendly purchasing of bath linen for hotel operations.

1.2 Research Background

The global bath linen industry has experienced a rising demand for luxurious, eco-friendly products and business approaches. The worldwide bath linen and accessory market is expected to be valued at USD 12.2 billion (GMI, 2024-a) in 2023. From 2024 to 2032, it is projected to rise at around 6.6% annually (GMI, 2024-b). With hotels and hospitals among them, the commercial sector accounted for more than 57% of the whole market share in 2023. The bed and bathroom linen sector in Sri Lanka is also growing. According to research (2025), the Sri Lankan bed and bath linen market is predicted to rise steadily between 2025 and 2031, due to increased demand in both the residential and commercial sectors. Specifically, the hotel sector consumes bath linen in considerably large quantities and needs regular replacements to keep up with the hygiene standards. This alarms at the potential environmental damage it could cause when these used bath linen are disposed of. The textile sector has been noted to be producing an average of 92 million tons of fabric waste every year worldwide (Vogue Business, 2025). And Bath linen also represent a considerable amount of this fabric waste. According to the report issued by the US Environmental Protection Agency (2018a), municipal solid waste, or MSW, fabrics accounted for over 7.7 percent of landfills in the US in 2018.

This amounts to approximately 11.3 million metric tons. According to studies, bath linen, including towels, sheets, and pillowcases, generate about 1.5 million metric tons of waste, only 15.8% of which gets recycled (U.S. Environmental Protection Agency, 2018b).

Waste management has been recognized as a considerable challenge in Sri Lanka, having many lands getting filled with unprocessed waste every day. The country produces between 6,500 to 7,500 metric tons of MSW per year, and less than half gets disposed of/recycled in a proper manner (MDPI, 2023). This fact indicates the higher possibilities of the disposed bath linen getting improperly handled, which will eventually cause massive environmental damage, including landfilling. Some countries, however, have taken various initiatives to reduce the effect of fabric waste, exemplifying the ways this fabric waste can really be handled responsibly. The Circular Fashion Innovation Network (CFIN) has envisioned establishing regional fabric recycling centers within the United Kingdom using automated sorting and chemical recycling methods (UKFT, 202). These products not only European Union has also established Eco Design Guidelines and Extended Producer Accountability (EPR) requirements, encouraging companies to take product lifecycles into account and to contribute to the recycling process and to collect the fabrics at the end of their lifecycle (Vogue Business, 2025). The Sri Lankan Bath Linen industry has an urgent need for environmentally friendly alternative. It is essential to solve the related environmental issues, as the bath linen business keeps expanding both in Sri Lanka and globally. Adopting sustainable processes, using innovative products, and portraying results from foreign projects would help Sri Lanka's bath linen sector be more ecologically friendly.

1.3 Problem Statement

The hospitality industry is a highly competitive business landscape where high guest expectations and intense competition characterize the hotel sector performance scale (Tavitiyaman et al., 2011). Especially where the quality of service, including the amenities and the products provided, such as bath linen, significantly affects guest satisfaction and brand perception (Akomaning, 2023.) Being in a digitally connected global market, every customer feedback impacts the future demand for hotels, where they are compelled to adhere to standards that meet the customer expectations .(Lee et al., 2003.) In hotel operations, bath linen, including bath towels, face towels, bath rugs and bath mats, represents an absolutely essential amenity for every hotel. Still, this often-used object has continuous difficulties in terms of sustainability and durability. Although hotels aim to provide a high level of comfort and hygiene, the conventional bath linen options now in use may contradict modern sustainability perspectives.

Lasting for many years, bath linen is a key factor that defines guest comfort and the experience with a particular hotel. In the long run, 100% cotton conventional bath linen is recognized to be causing more financial, environmental, and resource inefficiencies, where the question lies in why not

introduce an alternative solution that is more sustainable? With the current conditions of the conventional bath linen, guests will most likely not be able to use one linen up to its maximum useful life, which also starts to pressure the hotel prices pressured through the expenditures. More importantly, irresponsible linen fabric disposal mostly results in landfills, causing a significant threat to the well-being of the environment, and not preferring biodegradable fabric/substances for their bath linen to make it more environmentally friendly. Apart from the short lifespan of 100% cotton bath linen, the washing process significantly influences the level of natural resource usage. Cotton materials tend to absorb more water for washing. The longer drying time leads to more energy consumption, which usually depends on gas power or electric dryers. Policies in Sustainability are taken together to reduce the negative harmful effects to the environment from hotel operations, particularly in relation to maintaining bath linen for hundreds of rooms daily (Legrand, et al., 2022).

Driven by both market demand and legal pressure, the global hotel sector has shifted recently toward sustainability (Jones et al., 2014). Guests are growing aware of the environmental policies of the destinations they visit. Hotels have been under pressure to show significant efforts toward sustainability. As a result, the hotel industry has given attention to obtaining certificates like Green Globe, LEED, and EarthCheck, inspiring their initiatives in environmentally friendly practices (Eskerod & Đurić, 2018). Meanwhile, a few hotels have addressed bath linen involved in sustainability initiatives through the concept of "reuse your towel" campaigns geared at customers. While many have embraced energy-saving approaches, sustainable energy options, waste separation, and organic products, the overall attention given to sustainability can still be considered insignificant.

Understanding the limits of traditional bath linen and its flaws that affect both the hotel industry and the environment, Eco-Bath Linen has been developed as a creative and innovative solution with a more cost-effective answer and with lots of benefits delivered to the environment. Having a greater exposure in the bath linen sourcing sector, the experience and the network have helped the researcher to initially select a product and the product concept since he saw the background of the sourcing, consumption, and disposal procedures, which is financially inefficient, along with other logistical, consumption and final disposal inefficiencies connected to regular towel replacements. Hence the researcher has decided to test the performance efficiency development of Eco-Bath Linen who has developed and marketed the product in collaboration with Indian textile producers with who has the technology and the right resources. These manufacturing companies are recognized for their quality and top-notch manufacturing techniques, who also have the technological capacity to create blended textile products as a solution to the unattended concern of using highly expensive traditional bath linen.

Eco-Bath Linen promotes energy savings by using a lesser time as well as resources for drying, beyond its durability. Many researchers have noted how hybrid fabrics reduce moisture absorption, which helps to save drying and washing resources and time by around 40% (Ullah et al., 2022). Overall energy savings can be significant since hotels run laundry facilities on a large scale and usually all day. Additionally, requiring less water, the solution helps to minimize environmental damage from chemical release into wastewater systems. The concept of Eco-Bath linen is much more in line with trends like circular economy and Product Lifetime Management (PLM), where extending a product's usable lifespan can benefit both financially and environmentally. To further promote ethical disposal for Eco-Bath Linen, it is expected to introduce user bath linen collection outlets where consumers can return their used Eco-Bath Linen products. These outlets will collect the used bath linen of the brand and direct it for various recycling and upcycling procedures where the consumers are guaranteed that they are not contributing to any sort of landfilling or any non-eco-friendly fabric disposal methods. Along with this guarantee that the hotels will have their products more sustainably, they will also be offered a discount for the number of bath linen they return to these outlets.

Sri Lanka's hotel industry provides the ideal background for this new concept. It is widely recognized that the Sri Lankan hotel and the tourism industry is highly blended with nature which is why the Sri Lankan Hospitality Industry should prefer a more sustainable solution for the bath linen usage while keeping up the quality levels to the client expectations. Travel and Tourism in Sri Lanka, has a growing influence on the country's GDP, which continuously pressures the hotel sector to introduce more eco-friendly business approaches. The growing awareness on the extensive amount of environmental damage and the need to stand up to reduce this environmental damage. This was further pressured after the drastic environmental-friendly shift experienced during and post-COVID pandemic. Eco-aware guests mostly prefer hotels that share their values, hence, a product like Eco-Bath Linen can help hotels meet these standards.

This study also expects to investigate the level of acceptance and the market readiness of a product like Eco-Bath Linen. From a sustainability standpoint, Eco-Bath Linen clearly has advantages, however, effective market acceptance depends on user satisfaction, especially for hotel guests. In this sense, comfort, appearance, and the perception of quality are quite important factors. The project will thereby do a 90-day pilot test at the well-known environmentally friendly Mapakada Village Hotel in Mahiyanganaya, Sri Lanka. The sample Eco-Bath Linen products, including washing towels, face towels, and bath mats, will be inspected in terms of guest feedback and wash durability during this period. Particularly considering the environmental advantages, comfort levels, product convenience, and perspectives of value will be evaluated using interviews with hotel staff, along with several selected guests.

In addition, the product pricing impact based on the cost savings is also expected to be evaluated more closely to determine its feasibility. Eco-Bath Linen has been recognized to be comparatively expensive than conventional bath linen. However, considering the extended lifespan and the other assurance it gives to retain the quality and the appearance of the fabric, it will further assure complete usage of these products until the end of their lifecycle. Also, it is a question of whether the hotels view this as a wise investment. As per the researcher's viewpoint, Eco-Bath Linen has great potential to solve a major recurring operational challenge in the hotel sector. With the expectation of textile innovation with the target objective of reducing the negative impact in terms of the organizational cash flow and broader environmental impact from the use of bath linen, this product concept expects to present an ethical and economically feasible solution for hotel bath linen consumption. The research results are expected to be used to understand the feasibility and to promote the product "Eco-Bath Linen" to hotels worldwide. And the start with the focus of the product promotion will be in Sri Lanka, and based on the market results, the product is expected to be taken to the global hotel market. If the product was found feasible, it could be forecast that the overall operational policies, procurement plans, and product innovation in the hotel industry covering both Sri Lanka and overseas will face a drastic but positive conversion.

1.4 Research Objective and Research Questions

As a way of initiating the evaluation of the product in the real operational environment, the researcher expects to conduct a pilot test at the Mapakada village hotel, located in Sri Lanka. The study expects to meet the urgent and unattended demand for environmentally friendly bath linen substitutes for conventional bath linen, which have much lower durability and have a severe negative impact on nature due to their irresponsible disposal and frequent procurement trend, as well as the excessive amount of resource consumption to maintain these products. Bath linen are heavily used in hotels globally, and the majority of the 100% cotton bath linen can maintain their quality up to 150 washes, given the fact that the linen can get pile and misshapen even before completing this 150 cycle. This detailed evaluation is expected to help to. With the rising pressure on the hotel sector to embrace sustainable practice, this research aims to analyze is the proposed product fits the industry requirements in terms of durability, user comfort, cost-efficiency, and ethical practices in disposal handling (Jones et al., 2022). Traditional bath linen, especially the 100% cotton bath linen, have a lot of drawbacks, such as short lifespan, higher probability of having a mis-shape before reaching their lifespan, piling, high water and energy consumption during the cleaning, and a massive number of disposals which happen frequently (Muthu, 2015). This places a significant financial and environmental pressure on hotels, but so far, no sustainable solution has been offered. In this context, Eco-Bath Linen can be a good solution. The product has several qualities that overcome the drawbacks of conventional bath linen, such as a long lifespan (up to 300 washes), no piling, rapid drying, less water

consumption, followed by a recycling program at the end of its useful life. To evaluate the product's feasibility for broader acceptance in the market, the study is expected to collect primary data through qualitative methodologies, including interviews with hotel staff and surveys of guests staying at the Mapakada Village Hotel, Mahiyanganaya, Sri Lanka. The data will be analyzed systematically to assess multiple independent factors that influence product feasibility, including improved durability (300 washes), firmness (zero piling and consistent shape), pricing benefits associated with longer usage, environmentally friendly recycling techniques, the consumer convenience, as well as the sourcing and supply chain model (Creswell & Poth, 2017).

Research Aim

The key objective of the research is to understand the commercial viability of Eco-Bath Linen under the areas of product and price efficiency, impact on the environment in actual hotel settings. The objective of a study is described as a researcher's general intention or major focus (Creswell and Poth, 2017). It communicates the key reason for conducting the research. In this example, the goal is to determine whether Eco-Bath Linen can be a reliable, ecologically friendly, and economically feasible replacement for typical cotton towels in Sri Lankan hotel industry. The researcher expects to confirm if Eco-Bath linen is a feasible product to introduce to the market as a strong alternative solution for the ongoing financial, operational, and environmental challenges of using conventional bath linen. The following independent factors are expected to be focused on to identify the difference between the conventional bath linen and the new Eco-Bath Linen. The primary data investigation through qualitative data analysis aims to determine a firm answer to whether Eco-Bath Linen scores better under these recognized independent segments and to confirm whether it's feasible product or not.

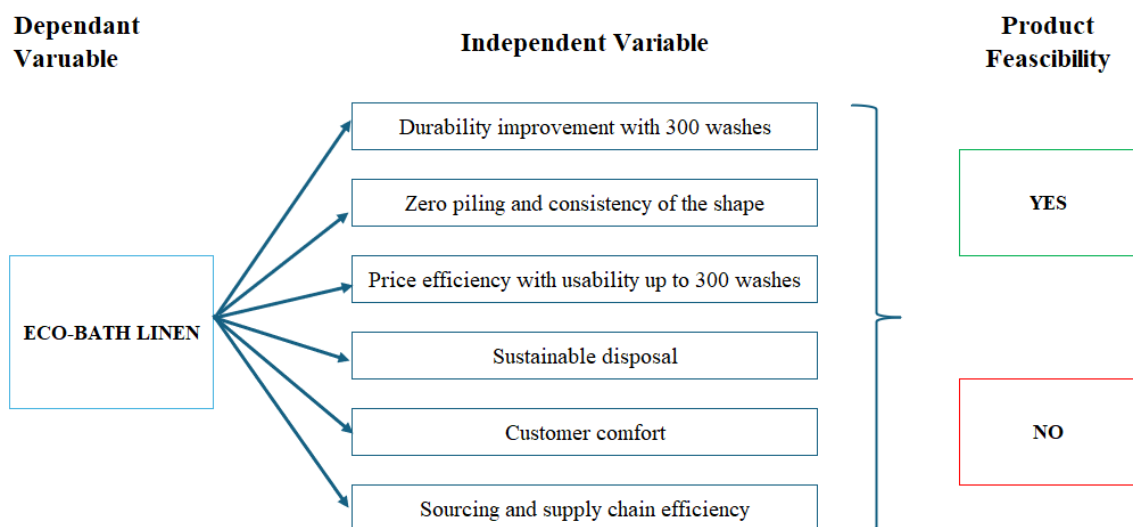


Figure 1: Independent and Dependent Variables of the Study

Research Objectives

Research objectives can be mentioned as specific, practical statements that describe what the researcher expects to accomplish from the research. The identification of the independent variables and the dependent variables provides the theoretical baseline to conduct the research, from the point of gathering data to analyzing and interpreting to find answers for the research questions (Bryman, 2016). The following key objectives are recognized as crucial aspects to collect answers about the Eco-Bath Linen product's feasibility from this research:

- To evaluate hotel staff and guests' experiences regarding the comfort in the consumption of Eco-Bath Linen.
- To determine whether the product's enhanced usable lifespan (up to 300 washes) improves economic value for hotels.
- To discover if zero piling and constant form is practically achievable from the product and the functional lifetime.
- To assess whether cost effectiveness and extended usability influence hotel linen purchase and budget management.
- To investigate opinions of sustainable disposal methods and how they relate to the hotel's environmental initiatives.
- To investigate the efficiency and environmental sustainability of the product's sourcing and supply-chain structure in achieving environmentally friendly requirements.
- To identify whether the information gathered from the hotel's employees and customers is enough to warrant introducing Eco-Bath Linen to other kinds of hotels in Sri Lanka.

Research Questions

With the expectation in achieving the objectives, the research questions expects to focus on collecting user feedback on the Eco-Bath Linen product, covering the variables such as durability, cost efficiency, comfort, and the sustainability aspect of using the product. The questions were designed to address two primary respondent groups as mentioned below.

1- The hotel staff involved in sample product washing and drying (maintenance)

2- Hotel guests who will use the product during their stay.

Two separate questionnaires will be utilized to gather information. One questionnaire from the hotel staff from the washing, operations, guest relations, finance, and procurement departments will engage in online discussions where they will be asked structured questions to get their feedback for a qualitative research analysis. The questions will focus on the product's durability, the unchanged

structure of the towels, zero piling, and overall handling experiences across several washes. These virtual interviews are expected to provide the researcher an in-depth operational information.

Second, hotel guests will be asked to comprehensive brief survey about the comfort and overall impression of the Eco-Bath Linen. Before receiving the goods, guests will be given a letter of consent to sign confirming that they are willing to test these bath linen products as volunteers and to give their unbiased feedback. To ensure the privacy and convenience of these volunteers, the survey will be conducted at their convenient time. This method ensures voluntary engagement while gathering real-time experiences. The data acquired from both methods will be theoretically evaluated to find the most common feedback across fundamental evaluation categories to conclude the answers for each segment, such as comfort, durability, price efficiency, sustainability, and supply chain efficiency.

Annex 1 – Questionnaire for the Mapakada Village Staff

Annex 2 - Questionnaire for the Mapakada Village Guests

1.5 Expected Study Outcome

The researcher aims to understand the product's performance, based on the stakeholders' opinions and wash tests using the qualitative study method. The research findings are expected to make a comparison with the conventional bath linen to understand how well Eco-Bath Linen will address current challenges of durability, consumer satisfaction, and the sustainability aspect of using Eco-Bath Linen. Based on the majority of opinions gained from interviews and surveys, the research will make evidence-based recommendations on whether Eco-Bath Linen is a viable product for the commercial use focused at the Sri Lankan hotel industry. If the results are positive, a strategic implementation plan and marketing model could be provided to better attract the Sri Lankan Hospitality industry. In contrast, if significant shortcomings are detected, the study will recommend product modifications before introducing to the market.

1.6 Significance of the Study

The segment captures and justifies why the selected topic is considered to be valuable and important to today's context (Foedermayr & Diamantopoulos, 2008). Also, the study's significance is important to justify why the researcher has selected the study and what he expects to achieve independently, as well as for the broader audience (Darke et al., 1998). This also identifies the parties and industries that will find the study findings useful and important. First of all, the eco-bath linen is a prospective new business concept that tries to see the light of success in its target market. And the study will capture one of its milestones in the business planning stage. Also, the study findings will provide

directions to similar products which is trying or in the process of testing to reach the market. The study findings will also provide a grasp of the current and emerging market expectations for bath linen in the hotel industry, where the study will provide useful insights with a clear background of how the current industry works and its expectations.

The study expects to resolve the currently unaddressed issues of overconsumption of bath linen and the irresponsible methods of disposal, and introduce a more long-lasting and environmentally sustainable solution as Eco-Bath Linen. It was recognized that bath linen are one of the main components in the hotel industry, which impacts guest comfort and eventually the guest ratings of the hotel. Hence, hotels are compelled to frequently replace the used, misshapen 100% cotton bath linen, which it also consumes a massive amount of resources to wash and maintain. The study findings are expected to cover how the proposed product would cover financial savings, supply chain process efficiency, washing efficiency, including the optimization of the resources utilization, indifference in user experience, and finally, the measures to protect the environment. Hence, the research findings would be mostly useful for the hotels globally that would like to try Eco-Bath linen in the future. Also, by manufacturers and companies who would come up with similar scale products as a line of direction to develop their business. The study also tries to explore the impact and the significance of each of the key independent variables on the hotel operations, as well as the environment where the hotels will have an influence, and why they should consider more environmentally friendly alternatives. Also, this study would be found useful by students who would like to study the hotel industry, sustainability, etc.

1.7 Limitations of the Study

Research limitations include anything that could limit the study's scope, methodology, or the potential for generalization of its results (Little,1993). Identifying these limits at the start of a study is critical for establishing transparency and defining the parameters throughout the study .(Varker et al., 2015.) The research has outlined implementing the necessary measures to ensure that the results are reliable and relevant, including selecting a prestigious hotel that is extremely popular among locals and foreigners. The researcher expects to collect primary and qualitative data that would give a broader understanding of the study scope and ensure that the data collected for the data analysis would provide detailed and reliable information through a well-organized qualitative data gathering approach.

Purpose of the research is to assess the viability and durability of Eco-Bath Linen which is highly useful for the hotel industry. The product samples comprise a complete set of bath linen, including Bath Towels, Face Towels, and Bathmats, which guests use during their stay. Hotel employees engaged in guest service and laundry operations, in addition to a portion of actual product users, will

have their data recorded regarding the washing outcome of the product. This approach ensures that the study covers a broader area related to conventional bath linen and its impact from the point of using it to washing and disposing of it at the end. While the study is limited to collecting data from just one hotel, Mapakada Village Hotel in Mahiyanganaya, Sri Lanka, it was carefully selected for its excellent rating and constant occupancy by both local and foreign guests. The hotel is nearly full year-round, making it a perfect setting for collecting diverse user input under realistic conditions. However, it is noted that integrating multiple types of hotels from various geographic areas will improve the broader applicability of the findings. Another limitation identified is the quantitative aspect of the study, which speaks in depth beyond statistical. However, personal preference and the individual quality expectations may influence the guest feedback. Since the feedback will be collected as an online survey form from the employees, this may limit the extraction of delicate observational data. Despite these limits, the process is intended to collect sufficient and insightful data to provide significant conclusions and recommendations.

1.8 Matrix in Research Type

Investigative Questions	Theoretical Framework (Chapter)	Results (Chapter)	Questionnaire questions
What is the life span and the rate of replacement of the Eco-Bath Linen compared to the traditional cotton bath linen?	Chapter 3.1 - Hospitality Textile Product Durability and Life span. (Includes literature on textile structure, fiber composition, and fabric performance)	Chapter 4.1 - The Financial Analysis of Durability and Lifespan.	What is the number of times the Eco-Bath Linen can be used and then wears out? What is the difference between the washing frequency and the replacement rate, and the former towels? What issues have you noticed with piling or material damage?

<p>What is the impact of Eco-Bath Linen on the savings of water and energy usage in hotel laundry processes?</p>	<p>Chapter 3.2 - Sustainable Hospitality Industry Laundry Operations. (Includes water and energy efficiency theory, linen use lifecycle assessment)</p>	<p>Chapter 4.2 – Water and Energy Efficiency</p>	<p>What is the amount of water and energy consumed in washing Eco-Bath Linen versus traditional linen?</p> <p>Is there a difference in the time to dry or in the laundry sessions?</p> <p>Does it need special washing conditions?</p>
<p>What will be the quantifiable cost savings associated with the use of Eco-Bath Linen in operating a hotel?</p>	<p>Chapter 3.3 - Hotel Textiles Cost Efficiency and Lifecycle Costing. (Includes a rough cost-benefit analysis and lifecycle costing model based on the usable lifespan)</p>	<p>Chapter 4.3 - The Cost Efficiency Appraisal.</p>	<p>What is your assessment of switching your cost to Eco-Bath Linen?</p> <p>Has the frequency of replacement reduced the procurement costs?</p> <p>Do you believe that it gives is more value for money than the last product?</p>
<p>What is the role of the end-of-life management of Eco-Bath Linen in being sustainable as compared to traditional linen?</p>	<p>Chapter 3.4 - Waste Management and environmental Sustainability of hospitality. (Disposal of textile waste, recycling, hotel circular economy)</p>	<p>Chapter 4.4 - Disposal the environmental sustainability</p>	<p>What is the disposition done to using Eco-Bath Linen in your department?</p> <p>Does it have any recycling or return systems?</p> <p>Do you think this practice results in waste reduction or better environment?</p>

<p>What do consumers of hotels consider as the comfort, softness, and looks of Eco-Bath Linen compared with traditional linen?</p>	<p>Chapter 3.5 - Hotel Textiles Customer Comfort and Perceived Quality. (Includes customer satisfaction, comfort theory, and sensory evaluation)</p>	<p>Chapter 4.5 - User Acceptance and Guest Comfort.</p>	<p>What is your rating of the comfort and softness of Eco-Bath Linen? What is the feeling of the towel with regard to the ones used in the past? Will you order the product again on future stays?</p>
<p>Why would the sourcing and production process of Eco-Bath Linen be sustainable and efficient in the supply chain?</p>	<p>Chapter 3.6 - Sourcing and Supply Chain in a Sustainable Way in the Textile Industry. (These include but are not limited to ethical sourcing, local production, and optimization of the supply chain).</p>	<p>Chapter 4.6 - Sourcing and Supply Chain Efficiency.</p>	<p>Do the suppliers of materials used have sustainability? What is the efficiency of the delivery and stock management? Is it easier to manage, order, and replenish these products than the old ones?</p>

Figure 2: Matrix

2 Chapter 2 - Literature Review

2.1 Global Bath Linen Market Overview

The global market for bath linen, including towels, bathrobes, bathmats, bath rugs, etc., is drastically expanding and indicating a massive demand growth over the years. The global bath linen market has been valued at 12.5 billion in 2023, with a forecast of \$25.7 billion in 2033 (DGR, 2025-a). The market growth projection indicates 7.2% of an average Compound Annual Growth Rate (CAGR) of between 2024 to 2033 (DGR, 2025-b). This number covers both the corporate and individual demand globally, which indicates a greater potential in the market for its consistent growth over the years.

Bath Linen Market Regional Market Size 2024 and 2023

Region	Market Size 2024 (USD Billion)	Market Size 2023 (USD Billion)
North America	4.3	7.9
Europe	3.8	7.0
Asia Pacific	2.9	6.5
Latin America	1.0	2.1
Middle East & Africa	0.5	1.2

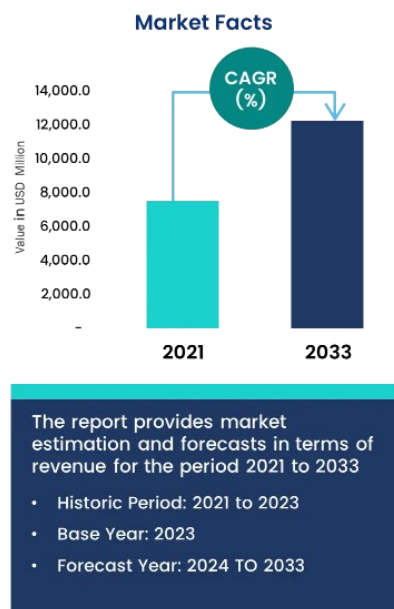


Figure 3: Regional Bath Linen Market (DGR, 2025-c).

Narrowing down this demand in regions like Asia-Pacific, this trend is gaining massive attention in the global bath linen market, increasing awareness and expanding e-commerce access to sustainable linen options (Sadhna et al., 2024). Also, to purchase more sustainable linen brands and to express their initiatives on how they are being socially responsible in their line of consumption

.(Goworek, 2011.) While the comfort and convenience of using these products are considered a must, consumers are also pressuring the hospitality industry to be more responsible and environmentally responsive in their linen usage (Bobbett, 2010). The Sri Lankan linen market consists of local manufacturers and importers who import from countries like China, India, and Thailand, among others (Dheerasinghe, 2009). Both the local manufacturers and the importers focus on both the direct consumer market as well as the corporate market (Ishengoma & Kappel, 2007).

Prices of the raw materials being used for this manufacturing process, like cotton and other supplementary products, have a fluctuating rate, which makes it more challenging to maintain the cost component without affecting the retail price (Moheb-Alizadeh & Handfield, 2018). The Sri Lankan linen market follows “Jordan Agar Market Government Policies,” which includes tariffs and regulations that are focused on protecting the local manufacturers and promoting domestic production (Advocata, 2025). Also, the Sri Lankan government has implemented various policies on the Sri Lankan bed and bath linen market, controlling the pressure from the importers.(Dheerasinghe, 2009.) The local linen market also follows international quality standards when it comes to the key elements like ingredients, quality expectations, labeling, safety, and comfort levels to ensure the end customer gets a good quality product at the price they pay (De Silva et al.,2021).

Because of the increasing level of growth in the Hospitality Industry, many international hotel chains have approached Sri Lanka (Weerathunga et al., 2020). This has challenged the local hotel chains to keep up to the international quality expectations regardless of their geographically based location. Regardless of the growth in the linen demand in the local markets, the hospitality industry still holds the majority of the country’s linen demand, let alone the demand for bath linen. As a result, hotels that are especially branding themselves as eco-conscious prioritize their selection of bath linen and demand more sustainable, durable, recyclable products (Iyengar & Venkates 2024). Eco-friendly bath linen, particularly those that last long (average 300 washes), resist piling, and maintain their shape, are seen as the best solution that keeps their long-lasting effect and reduces the environmental footprint over time.

2.2 Product Durability

Durability in bath linen refers to how long a towel or a robe can be used while maintaining its original quality (Akomaning, 2023). Durability is a very important factor for hotels, as bath linen are getting washed almost every day (Hasan et al., 2022). A normal cotton towel will last around 120-150 washes before it starts to become thin, lose its softness, or start to tear (Mendelson, 2009). After this, hotels have to replace them, which causes installation costs and creates waste.

In a typical hotel setting, bath linen are used and washed in larger volumes, where higher durability is a must to ensure cost management and reduction of waste (Styles et al., 2015). If a towel can last up to 300 washes, it can remain in service for twice as long as conventional bath linen, which causes a massive cost saving. The extended number of washes capacity reduces how often hotels need to buy new stocks and also lowers the impact on the environment because fewer resources are used to produce replacements (Alexander & Kennedy, 2002).

Recent developments in textile technology have made it possible to create long-lasting bath linen. But these bath linen wear out quickly after several washing cycles (Mendelson, 2009). Cotton fibers break easily after several washes and leading to faster fabric thinning, piling, and rough texture. The cotton and polyester blend is a textile that gains strength without losing soft touch (Islam et al., 2019). This hybrid retains cotton's pillowy touch but resists wear through longer, sturdier use. While this stands as the most durable and popular alternative bath linen fabric option, the linen industry has invented a few other innovative concepts that also stand as better options compared to the 100% cotton bath linen. Such developments have made it possible to achieve linen that can last more than 150 washes while still looking good and feeling fresh.

Knitted Bath Linen Fabric - Introducing a knitted construction instead of a woven construction in the linen fabric is one novelty. Knitting allows the fabric to stretch slightly, reducing the stress on the fibers during washing (Agarwal et al., 2011).

Anti-Pile Finishes on the Fabric – Using various types of chemical treatments and weaving methods, the fabric method has been able to prevent small fiber balls (pile) from forming and coming out from the fabric structure (Achaw & Danso-Boateng, 2021). The chemical and special sewing treatment allows the fabric to have a tight weaving option where the yarns stand strong together as one and have no space to peel and deform during the washes.

Eco-Friendly dyes and finishing – This method uses treatments that strengthen the fibers while keeping them soft, without adding harmful chemicals (Singh et al., 2021).

Energy-efficient laundry tests – These bath linen are designed to dry faster with a lower level of water absorbency during their washes. This approach tends to save a lot of energy in the process (Polyakov, 2023).

The traditional bath linen are typically made of 100% cotton. Hence, they are soft and highly absorbent (Grimstad Klepp et al., 2017). formation makes the linen resilient against breaking down after multiple cleansings. Resistant to piling and shapeless drooping, such towels maintain their looks and practical usage over time. Also, this causes an increased fabric waste that contributes to environmental concerns. This enhances the level of strength and standard level of durability of the linen

fabric while maintaining the softness and comfort expected. This reduces the amount of water required to wash and shortens the drying time as well, saving both energy and resources used to wash. From a financial perspective, extended lifespan on bath linen lowers the total operational investment and the frequency of recurrence, as this reduces the frequency with which hotels have to replace the bath linen (Mendis, 2025).

2.3 Global and local case studies on Benchmark

In Europe and North America, companies such as Eco Knit and Green Hotels Association have highlighted the benefits of durable bath linen (Bobbett, 2010). Eco Knit, for example, produces bath linen that last up to 300 washes, claiming they use 15-20% less energy to dry while reducing their replacement cost significantly (Maiti et al., 2022). Many eco-certified hotels in the UK and the US have adopted these products to align with their sustainability goals.

The Sri Lankan hospitality industry has been growing after a massive downfall between 2019 to 2021 (Wickramasinghe & Naranpanawa, 2024). The industry is experiencing a massive rise in eco-tourism and sustainability, which has become a stronger force in changing the current hotel practices to convert into more eco-friendly approaches while maintaining a higher level of visibility and transparency of their disposal systems. Sri Lanka, being recognized as a textile-producing country, has a greater potential in developing more locally viable linen products (Tewari, 2008). However, the capacity of such local textile production has merely touched the linen manufacturing and has a minor representation compared to the importers.

2.4 Piling and The Consistency of the Shape

Piling occurs when small fiber balls or loops form on a fabric surface, creating a rough, worn appearance (Liu et al., 2022). Fabric deformation goes beyond just piling and starts to change the shape of the fabric structure in ways like fabric shrinking, stretched edges, or uneven loop formation (Hu, 2004). These cause the bath linen to be removed before they reach their fullest usable lifespan. For instance, increasing the loop height by just 1mm or adjusting the number of picks per centimeter can change a bath linen's weight and its stability (Mendelson, 2009.) Ensuring the shape and consistency of the bath linen is important in the hotel and hospitality industry. The hotel attracts hundreds of guests who are a mix of locals and multinationals (Assaf et al., 2015). Hence, their experience levels and quality expectations vary, where it is a must that the hotels need to maintain an acceptable quality level that meets the international quality standards. When using bath linen, the key expectation is to have a clean, plush fabric, but when they lose this visual representation, they tend to indicate a lower quality that impacts the good name of the hotel just as much as it impacts the guest's experience.

Piled bath linen not only look dated but also feel rough as they reduce both the comfort and appearance of the fabric. Especially this is a greater concern for a star-class hotel where they are compelled to frequently replace such worn-out bath linen in order to maintain a positive guest experience, as it impacts the future reservations and the revenue to the hotel. Deformation, whether through shrinking or wrinkling, can also be affected due to the storage methods (Nanda et al., 2011). As if the fabrics are forced to compress, the fabric tends to deform, causing earlier deformation. These are some areas that are not highly considered important in a busy working environment, which also have a significant impact on the overall bath linen consumption. (Yates & Evans, 2016.) These hotels plan to keep a higher procurement budget for the bath linen, which is a considerable value per unit to replace a high-quality fabric. Improving piling resistance, hence, seems more important as a solution to reduce the frequent bath linen replacement rate. To overcome the piling and deformation challenge in bath linen, textile science has introduced several techniques and technological advancements that provide alternative solutions.

Loops design and Weave Construction – loop height and fabric density have been recognized as a key loophole in forming piles. Using controlled experiments using CAD and CAM designs on terry bath linen, a method has been discovered that increases the loop height and picks-per-centimeter correlate directly with fabric mass and stability (Ahiabor et al., 2018). These methods have helped manufacturers to design bath linen rich with softness, absorbency, and resilience.

Ring-Spun and Zero-Twist Yarns – Ring-Spun cotton yarn produces a tighter, stronger weaving method that helps to maintain the loop integrity under repeated usages and washes. Bath linen made from ring-spun cotton have been recognized for their durability, absorbency, and the ability to retain a lush pile without excessive shedding (Henderson, 2023). Zero-twist bath linen, which are made out of loosely twisted long-staple fibers, are extra soft and plus but it would require a precise finishing method to prevent early piling.

Cotton-Polyester Core Construction – This method uses a synthetic core which is encased in soft cotton loops. For example, Centrium's core technology embeds a strong polyester core within ring-spun cotton loops, significantly boosting strength while preserving the softness of the linen surface. The end result is the ability to retain the fabric in a better shape with a reduced number of fabric breakages and a lesser amount of piling. (Omeroglu & Ulku, 2007.)

Anti-Piling Treatments – Even though this is not a commonly used method in the hospitality industry, some textiles undergo chemicals or surface treatments designed to reduce fiber fuzz; these treatments help to prevent small fiber particles from forming like cubes while maintaining a clearer surface over their usable lifetime.

2.5 Price Efficiency with Usability

In the hotel industry, the cost of linen is not only measured by their purchase price, but by their entire lifecycle cost. This includes the cost of purchasing, laundering, handling, storing, replacing, and finally disposing of the bath linen. As a result, hotels often rely on a cost-benefit analysis framework when making procurement decisions. These frameworks help companies to calculate the long-term value of a bath linen rather than focusing only on upfront costs. Conversely, a bath linen that lasts for 300 washes spreads its cost over a longer period of time, which reduces the average cost per use. This is crucial in the hospitality industry, where bath linen are washed almost daily, making durability a major financial concern.

One of the simplest and yet the most effective ways to measure price efficiency is through price-per-use calculations (Kwortnik et al., 2006). Eg:- if a hotel buys a towel for \$10 and it lasts for 150 washings, the cost per use is about \$0.067. However, if a higher-quality bath linen costs \$15 but lasts for 300 washes, the cost per use drops to \$0.05. The Boston Textile's cost-saving guide indicates that standard fabrics can often ensure 200-300 wash cycles, while bath linen can reach only 100-150 washes unless its properly taken care of (Benson, 2014). This needs very careful maintenance practices to be able to extend the life span by another 20%-30% maximum. Studies emphasize the importance of investing in high-quality, durable linen as the durable linen last longer, which eventually saves money in many aspects which not only concerning the price tag of the bath linen.

This approach also aligns with findings from Hospitality procurement studies, where long-term cost efficiency outweighs the short-term savings. Suppliers such as D'Zee USA, KKR Linen emphasize that investing in better bath linen lowers the replacement frequency and contributes to more stable operating budgets (Ricky, 2023). The simplest logic behind this is that by reducing the mix in linen, hotels spend less on logistics, shipping, and warehousing, all of which add hidden costs to procurement. Price efficiency also impacts the operational side of hotels (Arbelo-Pérez et al., 2017). Every replacement cycle involves costs beyond the price tag of the product. Hence, the staff has to manage these linen with a lot of care from the point of collecting the stocks, to operations, and till the point of disposing of them. The laundry unit of the hotel also has a higher responsibility to ensure the bath linen get to meet their fullest life span of washes. The laundry team gets to have more workloads when bath linen wear out quickly, as roughness or piling requires more careful handling and sorting (Depiné, 2020). Durable bath linen reduce these indirect costs by being able to maintain the quality as is, requiring less frequent detailed maintenance to keep the quality and comfort consistent. In efficiency par-level management, the number of linen needed in circulation is another critical factor to consider (Williams, 2004). Hotels that rely on linen with shorter lifespans have to keep higher per-levels to ensure enough clean bath linen are always available. With the linen which has an extended

lifespan, par-levels can be managed more effectively, reducing the storage requirements and simplifying the logistics and handling expenses of linen. Studies indicate that even a small reduction in storage space or logistics demand can translate into substantial savings over a year (KKR Linen, 2023)

Durability and price efficiency are directly linked to two factors when it comes to bath linen purchase. A product that can withstand 300 washes without losing its quality gives a much consistent, predictable cost planning for hotels. The management can confidently budget for linen, knowing these linen will last for a fixed period, which reduces the uncertainty caused by frequent replacements (Haloho et al., 2024). Also, durable linen reduced the cost component in laundry. The bath linen is so durable that after 300 washings it still looks like new. With no piling, it requires less water and detergent and significantly less heat to dry. Ultimately, over thousands of laundry cycles, the savings in both electricity and water bills are visible. (Pakula & Stamminger, 2010.) Research has shown that as a result of their use of environmentally conscious towels, ecological bath linen have reduced energy and natural consumption from washing by up to 20%. With them, durable bath linen dry off far quicker (Yates & Evans, 2016). which means less time spent in the laundry room for busy people like you, but also greater conservation of energy throughout every process. To meet the growing demand for durable bath linen. There are also reputational benefits tied to cost savings. Guests increasingly would notice when a hotel provides high-quality and sustainable linen products and when they experience it. Bath linen that stay soft and presentable longer reduce the tendency of guests to complain and enhance the brand perception of the hotel (Akomaning, 2023). In an industry where online reviews strongly influence future bookings, maintaining consistent linen quality has both financial and marketing value.

2.6 Sustainable Disposal

The textile industry is considered as one of the largest global polluters, generating millions of tons of fabric waste per annum. Ellen MacArthur Foundation (2025), stated that textiles contribute around 92 million tons of waste per annum and much of which ends up srocking in landfills or incineration sites (Gupta et al. 2022). Bath linen, though small in volume compared to fashion apparel, still contribute significantly to this problem, especially in the hospitality sector, where turnover is high. Synthetic fibers, such as polyester blends, add another layer of complexity, since they can shed microplastics during laundering and take hundreds of years to decompose when discarded.

Each year, the hotel industry throws away a huge quantity of linen. A Green Hotelier study found that most hotels now dispose of their old textiles through local waste streams at best (Singh, et al., 2014). In many cases, stuff is simply thrown into a landfill site to rot and decay untended. As for recycling this waste fabric, some experiments have been carried out using worn linen for carpets,

cleaning cloths, or other items that are still functional. But it is just as likely that the whole pile ends up in garbage bags. At luxury or eco-resorts, some responsible disposal options are emerging rejected bath linen are cleaned and then given to charities dedicated to helping people in need or perhaps the animals at a shelter, where they can find new homes. Or else they're recycled into wear that serves an industrial purpose .(Singh, 2013.) Yet such activities are not widely performed across the industry, and so much money is consumed that there will be few hotels able to afford them, given their present budgets. Even so, the hotel industry continues to encounter problems with sizes, transportation, and costs related to recycling or such donations. If not systematically planned, bad disposal will result in huge rubbish rather than in complete circulation.

The circular economy concept has gained much attention as a solution to fabric waste. Instead of a linear “take, use, discard” model, the circular approach notes about reuse, recycling, and re-manufacturing as part of re-purposing. For bath linen, this means extending their product lifecycle through durability, repurposing worn items into new products, and recycling fibers into raw materials for fresh production. Recent textile recycling initiatives indicate positive improvements, such as converting fabric waste into recycled fabric, which is as good as new fabric to use (Juanga-Labayen et al., 2022). Recover Textile systems in Spain has shown progress by transforming pre- and post-consumer waste into high-quality recycled cotton fibers, reducing the need for fresh cotton fibers, and saving lots of natural and synthetic resources in the process.

European hotel chains like Accor and Marriott have initiated textile recycling programs in collaboration with specialized recycling companies, where old linen are collected, processed, and returned as new products (Rodríguez-Antón et al., 2019). Yet for all this, in Sri Lanka, the matter of fabric waste management is still at a very early stage. But the country holds great promise thanks to its well-established garment industry. Initiatives like linking hotels with local recycling or product repurposing companies would give the hotels a sustainable disposal chain where they can empower themselves to do something and align with government green economy objectives at the same time (Radosavljevic & Mihailovic, 2024). But the sustainable disposal of bath linen will need a major shift from irresponsible disposal to a circular model culture that promotes recycling and remaking. AI Hotels will integrate recycling, usable fabric donations, and fiber recovery projects, then reduce the volume of waste from their hotels, which is damaging to our environment (Radosavljevic & Mihailovic, 2024). This will also enable the government's aims in relation to the hospitality industry, as noted earlier. This will further support the government in achieving its green economy goals related to the hospitality industry.

2.7 Customer Comfort

For bath linen, comfort is a multi-dimensional factor influenced by material type, construction of the material, and its comfort level performance. The softness is often associated with fiber length and weaving composition. Absorbency is another key factor determined by loop density and fiber type. Bath with a higher GSM (Grams per Square Meter) are more absorbent, but often are too heavy (Henderson, 2023). And these linen take longer to dry as well. The drying speed is also a critical measurement factor for both guests and hotel operations. Quick-drying bath linen are perceived as fresher and are more efficient in laundry cycles, reducing energy use.

Research into the linen products used in the Hospitality sector indicates a stronger link between linen quality and guest satisfaction. A 2019 Hotel Management survey found that 72% of guests rate bath linen quality as an important factor in their stay experience (Akomaning, 2023). Guest reviews mostly have noted the points like rough, thin, or poorly maintained bath linen associated with lower service quality, even if other aspects of the hotel meet the expectations (Akomaning, 2023). Hotels that invest in premium, comfortable bath linen often report higher guest satisfaction scores and repeat bookings. According to studies such as the “International Journal of Hospitality Management”, it has been emphasized that tangible service elements like linen directly affect the guest perception of the overall service quality.

The technological advancements in the textile industry now allow producers to deliver more eco-friendly and comfortable bath linen with the capacity to compete with the comfort levels of conventional bath linen quality. The newest inventions of bath linen with a polyester base and a cotton pile, for example, combine more durability, softness, and comfort levels that match and exceed the quality levels of the conventional bath linen (Mendelson, 2009). Advanced textile technology is also improving the fiber capacity to absorb less water, which will require fewer resources to use during the washing process. According to reviews posted on travel sites such as booking.com in 2023, 73% of those global travelers attending non-traditional conferences opt for eco-friendly accommodation, but comfort cannot be shunned for this (Chaker, 2023).

2.8 Sourcing and Supply Chain Efficiency

Responsible sourcing is a new market requirement and already global hotel chains like Hilton, Shangri-La have begun insisting on certifications like OEKO-TEX or Fairtrade certifications to make sure that they deal with the right companies that offer the right materials. Ethical sourcing is a social responsibility, and also a marketing opportunity. There is increasing demand among the nature-lover customers to the hotels to know where their products originate. (Moisander & Pesonen, 2002.) Raw material sourcing can be influenced when there are price fluctuations in raw materials like cotton.

Along with fluctuations in the prices of materials such as cotton, other world events, such as the COVID-19 Pandemic spread recently, complicated the delivery of linen as well.(Castañeda-Navarrete et al., 2021.) Since hotels are mostly dependent on imported goods they tend to gamble with exchange rates, the transport lag, or some other issue.(Castañeda-Navarrete et al., 2021.) The overall time it takes lags the overall production process, where the manufacturers are compelled to rely on a shorter timeline to meet the product deliveries while maintaining the quality standards (Anderson, 2020). Most of the shipments are being insured if damage happens, but the financial loss caused by the shipment delays cannot be recovered.

Production of bath linen locally allows companies to have better control over quality, faster lead time, and a reduction in transportation, and reduces the emissions/carbon footprint involved. One reason is that the imported linen are often cheap, while there's no visible quality difference between the local product and the imported products (Waithera, 2008). This situation has become challenging for the local manufacturers to gain full control of the market, while they also can't cut down on the prices to meet these lower rates due to high material and labour costs. As a solution, local suppliers can come into ethical partnerships with the foreign suppliers to negotiate the prices to cut down the manufacturing cost (raw materials). Also, the government can play a major role in setting standards for the quality and price, so the importers can't dominate the market through price strategies, and the local manufacturers would also be able to get a fair opportunity to expand their market locally.

The sourcing and supply chain efficiency heads a key role in ensuring reliability and sustainability in the bath linen segment of the country (Johnsen et al., 2018). Ethical sourcing ensures guests and hoteliers of responsible production, while a strong supply chain management system would protect the product quality from disruptions. To leverage the Sri Lankan local manufacturing industry for bath linen is important to reduce the level of reliance on imported linen products. This will also be able to strengthen the local manufacturing capacity for bath linen and will be able to source local materials to develop more sustainably competent, durable bath linen versions in the future.

3 Chapter 3 - Methodology

Introduction to Methodology

The methodology chapter explains how the research is carried out and the methodological basis of selecting the direction of conducting the research (Flick, 2015). As the study aims to evaluate the product feasibility and the positive environmental impact caused by the new product “Eco-Bath Linen” based on the hotel sector operations, the methodology expects the findings to be reliable and relevant to develop clear decisions on introducing this product to the Sri Lankan mass market.

The research objectives focus on testing the product feasibility of Eco-Bath Linen, measuring its impact on the environment, and the positive resource saving, such as water, energy, and the frequency of changing into new bath linen. However, the product has not yet reached the considerable market attention in a way that has been accepted with a clear understanding of its improved performance compared to the conventional bath linen. The research aimed to understand the product's feasibility under several categories to understand how well the Eco-Bath Linen can be promoted as the best alternative solution for the environmentally expensive conventional bath linen.

- Extended usability of the bath linen
- Whether there are any differences between the feel and comfort of them compared to the conventional bath linen
- Resource savings during the reusing process
- The opinion on recycling these linens to reduce the amount of negative environmental impact

The research onion model moves from broader choices, such as philosophy and approach, to more specific ones, like strategy, data sampling, primary or secondary data collection, and the collected data analysis.

3.1 Research Philosophy

The research philosophy describes how the study regards knowledge and develops the findings (Mbanaso et al., 2023). The research onion offers three broad paradigms, which include: Positivism, Interpretivism, and Pragmatism. Each paradigm reflects different ideas about how knowledge can be created and trusted. (Abdelhakim, 2021.) The theory of positivism can be described as the basis in measuring with facts and numbers (Park et al., 2020). In this philosophy, the study works with numbers and facts. Positivism is very useful when dealing with measurable outcomes such as the number of washings a towel can last, the amount of water used, or the cost savings from energy efficiency practices. However, positivism is limited in this study because the research is not only about numbers but also people's perceptions, comfort, etc., which cannot be fully captured through

a scientific calculation method itself. Pragmatism is another philosophy that combines both qualitative and quantitative approaches, arguing that the research question should determine both the methods (Morgan, 2007). However, in this case, the study is designed as purely qualitative questioning, focusing on rich, descriptive feedback from hotel staff and guests. Since the research does not involve a quantitative dataset such as statistical testing of costs, energy, or water savings, pragmatism is not the best fit.

Interpretivism is the most suitable philosophy for this study. It focuses on understanding reality through human experiences, perceptions, and meanings (Ryan, 2018). This aligns directly with the research objectives, which are to explore how hotel staff (involved in the washing process) and guests (who use the towels) experience the Eco-Bath Linen in comparison to traditional linen. Interpretivism allows the study to value multiple perspectives, recognizing that each participant may have a unique view of comfort, durability, or sustainability. Their feedback was collected through surveys. The data was then analyzed through Thematic analysis, where responses are grouped into themes such as durability, ease of maintenance, and comfort. While positivism and pragmatism are valuable in other contexts, they are not appropriate for this study. Interpretivism provides the best foundation to capture the real-life meanings and experiences of users, which is essential for evaluating the acceptance and sustainability potential of Eco-Bath Linen in the hotel industry.

3.2 Research Approach

The research approach explains how reasoning was used to move from observations to conclusions. In research design, three main approaches that are often considered are: deductive, inductive, and abductive reasoning. It is often lined with quantitative studies where the aim is to prove or disprove a prediction (Goswami, 2010). The study doesn't begin with a fixed hypothesis to test using a number of experiments. Instead, it expects to explore participants' experiences and identify patterns in their responses. It begins with data collection and then builds a theory from the patterns observed (Azungah, T. (2018). This is common in qualitative studies where the key objective is to generate new insights rather than confirming the existing theories.(Kuczynski & Daly, 2003.) The researcher already has prior knowledge from the hotel industry and from existing studies on sustainability and product lifecycle.

For this reason, the most suitable research approach can be noted as the abductive approach. It begins with real-world observations, such as the problems the hotel industry faces with conventional bath linen (short lifespan, piling issues, higher water absorption, higher energy use), and then considers existing theories like sustainability practices and product lifecycle concepts. The empirical data collected from staff and guest feedback were then used to test whether these theories explain the situation and whether Eco-Bath Linen can address the observed problems.

The abductive approach is well-suited to the study's purpose of product validation and feasibility evaluation. It allows research to connect practical issues (linen durability and environmental costs) with theoretical perspectives (sustainability and lifecycle management) and then to verify these connections using participants' qualitative feedback. In this aspect, abductive reasoning helped to ensure that the findings are both practically relevant to hotels and grounded as an academic theory.

3.3 Methodological Choice

The choice of methodology represents the data evaluation techniques chosen to answer the relevant research questions. The research onion highlights three main choices, namely: quantitative method, qualitative method, and mixed method. Quantitative methods involve collecting numerical data and applying statistical analysis to test hypotheses (Martin & Bridgmon, 2012). While quantitative data could measure aspects such as cost savings, energy efficiency, or wash cycles, it would not capture a more subjective personal experience of the hotel staff and guests. Since the focus of this study is on how participants perceive and experience Eco-Bath Linen, quantitative methods will not be suitable.

The mixed method approach combines both the qualitative and the quantitative approaches, aiming to provide a broader understanding of a problem (Lund, 2012). This approach is valuable when a research question requires both these measurable outcomes and human perspectives (Curry et al., 2019). In this study, the scope is clearly limited to evaluating staff and guest experience in one hotel setting. Therefore, mixed methods would complicate the study design without providing significant additional value to the study.

Due to these reasons, the study has selected to adopt a qualitative methodological approach. Qualitative research focuses on exploring meanings, perceptions, and experiences rather than measuring variables numerically (Silverman, 1998). It is especially effective when directly supporting the study's objectives. To explore whether Eco-Bath Linen is perceived as durable, comfortable, environmentally friendly, and suitable for hotel use. The data were collected from 15 staff members working in the washing section of the Mapakada Village hotel resort and 15 hotel guests who used the product during the pilot test run. Open-ended surveys were conducted. This kind of data collection can provide a lot of flexibility and richness. Thereafter, the methods of modulating analysis were applied to each of those responses. This method systematizes feedback based on major themes, including the comfort, durability, easy washing, sustainability and user satisfaction. In this study, the qualitative method was selected to make sure that the findings were founded on actual experience of using the linen. It also had the effect of leaning a bit towards an interpretivist philosophy and an abductive approach, such that there is a coherent and well-judged approach to the research itself.

3.4 Research Strategy

The research strategy determines the practical implementation of the study. Research strategy can be explained as the method that links research philosophy and the research approach to the particular methods of data collection and analysis (Mbanaso et al., 2023). Strategies such as interviews, surveys, observations, experiments, and case studies can be used for this purpose. Each has its strengths and limitations, but the selected strategy should fit the research objectives.

Survey

Surveys are valuable for reaching a large number of responses. This is less suitable for this study as the focus is not on statistical data but on gaining broader and deeper information from a smaller and carefully selected group of participants.

Experimental strategy

Experimental strategy is mainly used in scientific or technical studies where variables can be controlled and manipulated in a laboratory setting (Ross & Morrison, 2013). Since this study is focused on a real-world context rather than a controlled environment, a trial strategy is not suitable.

Ethnography and Grounded Theory

These are other commonly used strategies in qualitative research. Grounded theory speaks about building entirely new theory from data, but in this study, the purpose is not to develop a completely new theory but to validate a product within existing frameworks of sustainability and lifecycle management.

Case Study Approach

For this reason, the most relevant research strategy is a case study. This strategy allows the researcher to conduct an in-depth analysis of an actual phenomenon (Fridlund, 1997). It is especially useful when the limitations between the scenarios (Eco-Bath Linen) and the context (Hotel operations) are not clearly separate. In this thesis, the case study was based at Mapakada Village Hotel in Mahiyanganaya, Sri Lanka, where the product was being piloted. The 15 staff members were working in the washing and housekeeping section, and 15 participants who were guests who were visiting the hotel for their stay and who volunteered to use the sample products and give their feedback during their stay. Open-ended survey responses were expected to allow participants to share their opinions in detail.

The strength of this case study was that it connected the product evaluation to real hotel practices. Staff feedback provided operational insights into durability washing requirements and maintenance, while guests' feedback highlighted perceptions of comfort and sustainability. Collectively, the case study was expected to give a balanced view of the product's feasibility. With the selection of the case study as the research strategy, the research remained closely linked to practice while still engaging with the theoretical aspect. The case study not only tested whether Eco-Bath Linen works in a real hotel setting but also provided evidence-based understanding that can be used to compare against the theoretical concepts of sustainability and lifecycle management. This made the case study ideal for product validation and for answering research questions about whether Eco-Bath Linen is a feasible product to offer as an alternative cost cost-efficient, and environmentally friendly bath linen solution to the hotel industry.

3.5 Time Horizon

The time horizon section explains whether a study explore a situation at one point (Cross-sectional) or over a period (longitudinal). However, this approach doesn't capture how outcomes develop or change over time. In contrast, a longitudinal study observes participants or processes over a set period, allowing the researcher to examine changes, durability, and patterns that emerge across time. For this thesis, the longitudinal approach is most appropriate because the performance of Eco-Bath Linen cannot be understood in a single moment. Instead, its durability, ease of maintenance, and comfort needed to be tested through repeated use and washing cycles.

The research was therefore conducted as a 90-day pilot project at Mapakada Village Hotel, during which Eco-Bath Linen were used alongside the conventional 100% cotton bath linen. Staff members were requested to monitor the washing and maintenance experience, while the volunteer guests were requested to provide their feedback on comfort and usability during the trial period. This timeline ensured that the research could capture both the operational outcomes and user experiences after repeated use, making the findings more reliable and realistic, determining the feasibility of the product to be introduced to the mass market.

Annexture 1 – Timeline of the Study

3.6 Data Collection Methods and Sampling

The data collection has been cautiously planned to align with the research objectives and the interpretivist philosophy. Since the objective of the study was to analyze the user experience and sustainability perception of Eco-Bath Linen, the study used a qualitative data collection and analysis method. The data collection relied on first-hand information collected from hotel staff and the selected guests, as their experiences were the key method of assessing the product's feasibility in a

real hotel environment. The following approach was used to collect data. The study was based on primary data collected through surveys within the 90-day pilot test period.

Staff Members - 15 staff members were sampled randomly at the washing and housekeeping departments who could participate in the washing and handling process of the Eco-Bath Linen test products. They were allowed to manage Eco-Bath Linen samples within the 90-day pilot project. Their job allowed them to have valuable information on the longevity of the product, how easily it can be washed, how much time it takes to dry it, and how easily it can be maintained in relation to traditional bath linen. Staff members were also requested to give any comments that their guests made during their day-to-day operations.

Hotel Guests - The sample Eco-Bath Linen was approached in this trial period and requested to use and test it, and give their comments to 15 guests. Their opinions provide a consumer-side validation that complements the staff's operational perspective.

The pilot project was conducted at Mapakada Village Hotel in Mahiyanganaya, Sri Lanka, over a 90-day period. During this time, Eco-Bath Linen was introduced alongside traditional cotton bath linen, allowing for direct comparison. A total of ten sets of Eco-Bath Linen were placed in Guests' rooms, while another ten additional bath linen sets were allocated to the laundry section to do the wash testing to check the durability through repeated washing during this trial period. The staff survey focused on operational outcomes, such as;

Whether the linen showed piling or shape distortion after repeated washes.

- The volume of water and energy required for cleaning.
- Ease in removing stains.
- Perceived differences in comparison to traditional linen.
- Feedback received directly from guests.

The guest survey focused on user experience, including the following aspects.

- Comfort and softness of the towels during their use
- Perception of Sustainability and Eco-Friendliness
- Willingness to accept Eco-Bath Linen as an alternative to traditional bath linen
- Reactions to the concept of sustainable disposal and longer product life

Surveys were conducted as an online form-filling, considering the difficulty for the researcher of being based at the hotel full-time during the pilot test period, and the convenience of the participants. A few hours close to the guest's check-out, the online survey was shared so the guest could conveniently fill out the short questions. Failing to respond to these reminders was discarded as samples

and were discussed with the hotel management to gather another volunteer guest in replacement for the lost feedback. The core idea was to ensure the guests had 100% freedom to choose to share their feedback even after using the test products. But if they didn't prefer to share their feedback, they were not pressured at any point. This approach was referred to ensure the participants would only give unbiased and thoughtful feedback that comes from them willingly.

3.7 Data Analysis Plan

The data analysis phase was designed to make sense of the feedback collected from hotel staff and guests during the 90-day pilot study. Since the research was focused on qualitative data only, the analysis followed a thematic analysis table, which is used for interpretivist-type research to identify the patterns and meanings within participants' feedback. This method was chosen because it allowed the study to capture both operational issues by staff and the subjective experiences of guests in a structured manner.

Step 1: Data Preparation

Notes from online surveys were transcribed into written form to ensure consistency. Before analysis, the responses were re-checked with participants for confirmation to improve accuracy and credibility. This process ensured that the dataset was clean, complete, and reliable for the thematic analysis.

Step 2: Initial Coding

The analysis began with open coding, where keywords, phrases, and repeated ideas from the responses were highlighted. The guest feedback like "Softer than expected" or "comfortable to use," was coded under "Comfort". This step broke the raw data into manageable pieces without losing its meaning.

Step 3: Categorization

After completing the coding, the responses were grouped into broader categories. For staff data categories, including durability, ease of washing, energy use for drying, and guest feedback received. Categories included comfort, appearance, eco-friendliness, and overall acceptance were highlighted in guests' feedback. This categorization helped to organize the data to reflect the research objectives.

Step 4: Theme Development

From the categories, key themes were developed that represented the key findings of the study. Examples of themes included “Sustainability benefits, operational efficiency, and user comfort and acceptance.

Step 5: Interpretation

The final step is interpreting the study themes/ key variables in relation to the research objectives and theoretical frameworks. Eg:- staff observations about reduced water and energy consumption that were linked to sustainability and resource efficiency. While guests' perception ensured that the results were not just descriptive but also meaningful in answering the research question, “whether Eco-Bath Linen can serve as a sustainable and cost-effective alternative in hotel operations?”.

3.8 Reliability, Validity, and Limitations

Since the research relied on qualitative data, the concepts of credibility, reliability, and validity were addressed through careful planning and the method used to collect these qualitative data. Reliability was ensured by applying consistent procedures throughout the data collection. All the staff involved in the research and the guests received the two sets of open-ended survey questions, and the process of recording these responses was maintained as a standard. To further ensure reliability, participants were allowed to review and confirm their answers after the surveys, reducing the risk of misinterpretation by the researcher themselves.

Generally speaking, in the study, the validity of the data is raised in several ways. One of these was by making use of multiple viewpoints, with reports from staff on durability and washing requirements combined with customer feedback about comfort and eco-friendliness. The thematic analysis not only enabled the findings to be checked against what participants actually said, but also gave me a way of maintaining enough distance from data that my own assumptions wouldn't silently seep back into them..

The researcher has also come across a few limitations that were identified during the study. To start with, the sample size was felt that relatively small, with only 30 participants joining from a single hotel. While this was sufficient for an exploratory case study, it limited the ability to generalize findings to the wider hotel industry. Secondly, the 90-day trial period has somewhat limited the ability to figure out what will happen to the linen after reaching their 300-wash cycle. Although this period was considered enough to capture repeated washing cycles and guest experiences, if a longer period had been given, the researcher could have collected more information about its long-term

performance. Also, the research depended heavily on self-reported experiences, which may carry some level of personal bias in the feedback.

3.9 Ethical Consideration

The research was conducted with the highest level of care in order to protect the rights and comfort of all the people involved. Both the visitors and the staff were very aware of the nature of the study prior to acceptance of participation. It was assured to the participants would not be offered any monetary or non-monetary incentives, including money, gifts, and samples to them in regard to their Participation. Consent was collected from all the participants before the survey began, and staff and guests were well informed that they were allowed to say no or withdraw at any given time before proceeding to confirm the feedback, ensuring 100% flexibility and acceptance of the participant's preferences. To keep the responses confidential, no personal details such as their names, contact information, or room numbers were recorded by the guests. The staff were only identified by their department. (eg- laundry or housekeeping). The guests' feedback was kept anonymous. This meant that no answer could be linked back to a specific person. All the survey responses were stored safely in soft versions, and the file could be accessed only by the researcher to ensure the collected information would not be exploited at any given time. Also, with online data collection, no recordings were made, and only coded notes were used for the data analysis.

4 Chapter 4 – Discussion and Data Analysis

4.1 Introduction

The chapter expects to discuss and analyze the responses collected from the study Eco-Bath Linen. The drive of the study is to understand whether the new Eco-Bath Linen product can bring both cost benefit and environmental benefits to hotel operations while still meeting the guest comfort and service expectations, and to determine the product's feasibility to establish a strong basis in the mass market in comparison to the conventional bath linen that dominates the market at present. To collect the relevant data to do the analysis, a survey was conducted among two groups whose opinions mattered. These two groups were identified as hotel staff who were involved in washing and handling the bath linen and the final consumers/hotel guests who would be using the products. As an example, comments like “Dries faster” were coded under efficiency, while guest comments such as “Soft and comfortable” were coded under comfort. The following four main themes were developed to capture the key findings of this study.

Durability improvement (up to 300 washes) – To test whether Eco-Bath Linen lasts longer than the traditional cotton bath linen.

Zero piling and consistency of the shape – To understand if the new product could maintain a smooth surface and form after repeated washes.

Price efficiency and the ability to use up-to 300 washes – To measure the economic benefits in terms of cost-per-use and reduced replacement cycles.

Sustainable disposal mechanism– To evaluate guests' impressions about recycling and eco-friendly aspects of the product and their preferences.

Customer comfort – To capture how guests felt about the linen in terms of softness, comfort in use, and the overall acceptance

Sourcing and supply-chain efficiency – To assess whether the Eco-Bath Linen would reduce procurement frequency and simplify the stock management process.

The study has identified the “demand and acceptance of Eco-friendly bath linen in hotel operations” as the dependent variable. These results are expected to reflect how well Eco-Bath Linen will be accepted by both the staff and guests. Also, whether it can be introduced as a practical alternative to the hotel industry. The discussion has been formed under these six themes / independent variables. The chapter is expected to show how Eco-Bath Linen scored in terms of durability, comfort,

cost, sustainability, and supply efficiency during this survey. Then the feedback will be compared with the previous secondary studies and industry-related literature.

It is important that staff responses mainly focused on operational and economic aspects, such as the number of washes, usable period, procurement process efficiency, and cost savings. On the other hand, guests were more focused on comfort, appearance, and the sustainability aspect of the products. Regardless of the differences between the two focus groups, both groups agreed that the new linen showed clear improvements over traditional cotton bath linen. This chapter intends to explain the results of the survey and to build an understanding by linking participants' feedback with the research objectives and theoretical background, and showing how these research findings contribute to the overall goal of introducing a cost-effective and sustainable bath linen solution for the hotel industry.

4.2 Durability Improvement

One of the most important independent variables in this study is durability. The conventional bath linen are made out of 100% pure cotton fibers, which normally last up to 120-150 washes before they lose quality, show oiling, or get discarded. This improvement is not just a technical feature but an operational and environmental advantage. If hotels can use the same bath line for twice as long as they used to, it means that the new linen product has been able to reduce replacement costs and the number of times being re-ordered, which saves money while also cutting down the fabric waste.

Staff Perspectives on Durability

The staff responses strongly supported the idea that Eco-Bath Linen is more durable than conventional bath linen. Many staff members mentioned that these bath linen looked fresh and clean even after repeated washed.

“The Bath linen keep their shape even after many washes and look newer for much longer.”

“We can use them to wash more and to use them longer. And this reduces how often we order bath linen to replace the old ones.”

These comments indicate that durability is not only about the technical lifespan extension but also about maintaining appearance and usability, which are critical in hotel operations. Another point mentioned by the respondents was the “reduced need for replacements”.

In contrast, Eco-Bath Linen was described as a “reliable” and “long-lasting” solution. This not only helps the housekeeping operations but also reduces the burden on hotel procurement and budget management.

Guest Perspectives on Durability

Although guests are not directly involved in counting wash cycles or handling procurement, they did notice the difference in how the bath linen looked and felt. Several guests said that the bath linen appeared to be fresh and clean throughout their stay, even when used repeatedly.

“The bath linen looked neat and fresh even after we used them for several days and at least 3 times per day.”

“They looked fluffier, which felt fresh, and we could use them several times during our stay.”

“When I started using it, the linen looked fresh and looked appealing, and later got to know it was not a brand-new bath linen, I’m amazed.” Their positive feedback suggested that Eco-Bath Linen don’t seem to show early signs of wearing out, which is important for maintaining high guest satisfaction.

Comparison with the Conventional Bath Linen

The difference between Eco-Bath Linen and the Conventional bath linen was clear from both the staff and guest feedback. Staff often compared Eco-Bath Linen to traditional cotton bath linen by saying the new linen are “superior”, “more durable”, and “better in quality”. However, Eco-Bath Linen, in contrast, showed no piling and consistent shape with the fresh look, with comfort still intact, even reaching the complete 300 wash cycle with repeat laundry testing. This comparison supports the claim that the “Eco-Bath Linen” has a lifespan of 300 washes, which is double that of the conventional 100% cotton bath linen. Longer lifespan also means that hotels will have to purchase fewer replacements, and is connected directly to the next theme of cost and price efficiency.

Link to Environmental Benefits Every bath linen that lasts longer helps to reduce the amount of fabric disposal by delaying the frequency and reducing the amount that would be disposed of. Staff members noted that the traditional bath linen had to be replaced very often, leading to higher fabric wastage. This happens with more frequent bath linen disposal. However, “Eco-Bath Linen” was able to use up to 300 washes as predicted, and this cuts down the total number of bath linen that need to be manufactured, transported, and disposed. The longer the product life span is, the longer it takes to dispose of one batch of bath linen. In this scenario, it can be assumed that the “Eco-Bath Linen” saved one batch of conventional bath linen from being disposed of with its extended lifespan. Also, the longer lifespan reduces the demand for raw materials and energy used in production while also decreasing the frequency of waste disposal. As one staff member explained, “the reduced replacement need supports both cost efficiency and sustainability”.

Past Studies That Connect to this Perception

Past studies related to hotel textile management highlight that bath linen is a major cost center in hotels and a frequent source of waste. 100% cotton bath linen, which are recognized for their comfort, also have a relatively short life, which increases the operational costs. Various research studies and publications have highlighted that increasing the durability of fabrics/garments can significantly reduce both re-ordering costs as well as the negative environmental impact. Eco-Bath Linen product seems to be aligning well with the concerns raised in these studies and can be considered that this is a good solution for the hotel operations with its improvements in design and fabric structure. Studies on sustainable textiles often argue that “longer lifespan reduces the environmental impact by lowering the replacement rate and extends the resource efficiency of the product”. This is exactly what was observed in the trial with “Eco-Bath Linen”.

The overall Interpretation of the Durability aspect of “Eco-Bath Linen”

The findings show that durability is one of the strongest advantages of “Eco-Bath Linen”. Staff have observed clear benefits in terms of lifespan, usability, and reduced replacement needs. Guests also have noticed that the “Eco-Bath Linen” has been able to maintain their appearance and comfort during use, which indirectly confirms the durability claims. With the product being able to be as twice as long as the conventional bath linen, Eco-Bath Linen gives both economic and environmental gains to a hotel. Considering the economic aspect, the product was recognized for its capacity to reduce the replacement frequency, leading to reduced re-ordering cost and repeated procurement. Environmentally, it reduces fabric waste and contributes to sustainability goals. These results significantly support the first independent variable, "Product Durability,". With its extended washable cycle of life up to 300 washes, which has been verified and confirmed. This also demonstrates that longevity may be accomplished while maintaining comfort and guest satisfaction.

4.3 Zero Piling and Consistency of the Shape

Another important variable in this study is the ability to resist piling while maintaining its original shape consistency after multiple washes. One of the most difficult aspects of using standard cotton bath linen in hotels is that it quickly starts to pile only after a few washes. Guests often notice these indicators fast, forcing hotels to throw away such bath linen sooner than expected.

This not only changes the outer look of the bath linen, but it also makes folding, organizing, and storing more challenging for housekeeping staff. It is claimed to have zero piling and better shape retention compared to conventional cotton bath linen. This section examines whether staff and guests' responses support these claims.

Staff Perspective on Piling and Shape

Staff members, who handle the washing and daily management of bath linen, provided consistent feedback on the absence of piling. Several staff members reported they had not seen piling even after several washing cycles.

"No issues of piling so far, and definitely not like the usual cotton bath linen. They usually start to show pile after about 100 washes."

"Shape remains unchanged, and the bath linen doesn't seem to be shrinking or losing its form."

These observations show that eco-bath linen can maintain its original appearance which is important in a hotel environment where visual quality substantially influences customers' impressions.. Staff also highlighted that a consistent shape made laundry tasks easier. Bath linen that maintain their size and form are easier to fold, store, and present in guest rooms. A staff respondent shared their opinions in a few similar patterns. ***"Laundry work feels lighter because the Bath linen dry faster and keep their shape, so folding is quicker."*** This shows that zero piling and shape consistency not only improve guest experience but also support the daily hotel operations.

Guest Perspectives on Appearance

Guests generally do not use technical terms like "piling" or "shape retention," but they notice when the bath linen look or feel worn out. Several guests commented positively on the appearance of Eco-Bath Linen.

"The Bath linen looked neat and fresh even after several days of use."

"I didn't notice any piling or roughness, which is common in hotel bath linen."

Guests also linked appearance with comfort. If the bath linen look fresh, smooth, and have no knots or cords coming out, they feel the freshness and comfort in them, making it more appealing to use just as fresh as a new bath linen. This indirect feedback supports the staff observations and confirms that the guests have noticed the improved quality of the bath linen, especially after they have been given many wash turns.

Comparison with Conventional Cotton Bath Linen

The difference between Eco-Bath Linen and the conventional 100% cotton bath linen was strongly highlighted by both staff and guests. Staff members emphasized that cotton bath linen start showing the signs of piling very quickly, sometimes within the first 50-80 washes, depending on the usage

and the handling of the fabric softening materials. Once piling appears, bath linen often have to be removed from the offering to a guest and should be discarded to avoid any negative guest impressions. Eco-Bath Linen, in contrast, showed no piling and has been able to stay in its original shape during its tested 300-wash cycle.

“These look newer for longer, not like the usual cotton bath linen. They fade and lose their shape more quickly when we repetitively wash them.”

This difference is significant as piling and shape distortion are two of the main drawbacks for premature bath linen disposal in hotels. This Eco-Bath Linen seems to be a reliable solution to eliminate these challenges and extend its usable lifespan while reducing the chances of turning a good bath linen into waste while causing financial losses to the company.

Operational and Environmental Impacts

The absence of piling and consistent shape provides several operational and environmental benefits to the hotels.

Improved guest perception - Bath linen that appear fresh and comfortable improve the entire guest experience and their satisfaction.

Reduced Replacements – Fewer bath linen need to be replaced due to piling or dis-shaping, which eventually reduces the frequency of replacement costs and the disposal costs.

Ease of handling - staff save time and effort when folding and managing bath linen that hold their size and shape.

Environmental Sustainability - Minimizing early disposal results in less textile waste, which is consistent with eco-friendly methods.

One staff member summed this up by mentioning ***“no piling and consistent shape means we can keep these bath linen in service for a longer time, which helps the hotel and will not have to bother about putting them in to trash more often.”***

Literature Background

Studies in textile performance in hospitality operations point out that appearance is as important as functionality. Guests often judge the quality by what they see and feel. The design of Eco-Bath Linen, which combines polyester for strength and cotton for softness, reflects strategies discussed in textile sustainability studies. By improving structural durability and resisting surface damage, such textiles can support both the economic efficiency and sustainability objectives. Also, the shape consistency

is directly connected to laundering processes. Research suggests that fabrics that shrink or deform after repeated washes create operational inefficiencies. Eco-Bath Linen's performance in this area shows that product design can reduce both guest dissatisfaction and staff workload.

Overall interpretation

The findings strongly support the second independent variable, "zero piling and shape consistency". Both staff feedback and the guest feedback confirmed that Eco-Bath Linen did not show signs of piling and maintained its shape well after repeated use. For hotels, this offers obvious benefits.

- Provides longer-lasting bath linen • Reduces replacement costs
- Improves guest satisfaction with enhanced looks and comfort.
- Helps reduce fabric waste and promote sustainability.

To put it simply, Eco-Bath Linen appears to be addressing one of the most significant concerns in the currently available conventional bath linen. This solution (Eco-Bath Linen) will improve the guest experience and make the hotel operations more efficient with zero piling and chances of changing the original shape of the bath linen.

4.4 Price Efficiency

Another important independent variable in this study is price efficiency. They also require a higher amount of water and energy during the washing and drying process, which increases the operating costs. While responding to faster drying due to its low-absorbent polyester base material, consuming a lower level of energy. Price efficiency, in this study, refers to whether the product provides better value for money, over time, by reducing replacement costs. Lowering resource use and simplifying the procurement process.

Staff Perspectives on Price Efficiency

Staff members consistently highlight the economic benefits of Eco-Bath Linen. Several respondents explained that the bath linen last longer, so the hotel would not need to buy replacements as often. For example.

"We can use them for more washing cycles and reduce how often we have to re-order."

"They save money over time since spoilage is much less common."

Another concern raised by staff was the decreased need for replacements. Staff agreed that traditional cotton bath linen had to be thrown earlier than intended due to stacking or a worn-out appearance. Eco-Bath Linen, on the other hand, was praised for being "reliable" and "lo." This not only

improves housekeeping operations, but it also reduces the pressure put on hotel procurement and budget management.

Guest's Perspective on Durability

Although guests weren't directly involved in calculating wash cycles or managing the purchasing segment of the product, they did notice a change in the way the linen looked and felt. Several guests reported that the linen remained fresh and clean during their stay, even after being used multiple times. For example, one guest commented that;

"The linen looked neat, fresh and comfortable even after using them several times".

"They looked more appealing and good in shape compared to the linen I have used in some other hotels".

Their useful feedback points out that Eco-Bath Linen not only has a significant price saving but also keeps the guests feeling happy that they are being treated well by offering them high-quality bath linen, which is a more personal touching point.

Comparison with the Conventional Bath Linen

The participants collectively noted the differences between Eco-Bath Linen and conventional cotton bath linen. Staff members noted that the usual bath linen start to pile quickly, mostly within the first 100 washes. And this is highly dependent on how the linen are being handled. In order to ensure better guest experience and to avoid possible complaints about the bath linen they have been given, hotels have to frequently replace their bath linen stock as soon as they start to pile.

Eco-Bath Linen has shown zero piling issues and has been able to maintain its shape throughout the pilot trial period. One employee noted that "These linen seem to be able to keep in a better form just as new for a longer period, which is not the case for those linen made out of 100% cotton. They fade easily and lose their form." The difference is important as pile and deformation are two of the major reasons for early linen disposal in hotels. Eco-Bath Linen increases usable life and lowers waste by addressing these challenges. The following working explains the rough saving hotels would experience by shifting to Eco-Bath Linens.

** Assume the hotel orders 100 Bath linens at a time for their daily operations	
Rough cost calculation of Conventional Bath Linen	LKR
Conventional Bath linen corporate price (30x60, 750 GSM)	3,200.00
Cost for the 100 nos	320,000.00
Procurement cost, Handling and delivery charges	15,000.00
Total Cost	338,200.00
** Assume each towel get washed every day (Number of purchases per year)	2.43
365 days /150 washes	
Total cost of ordering Conventional Bath Linens	822,953.33
Rough cost calculation of Eco-Bath Linen	LKR
Eco-Bath linen corporate price (30x60, 750 GSM) (17% higher than the conventional bath linens)	3,750.00
Cost for the 100 nos	375,000.00
Procurement cost, Handling and delivery charges	15,000.00
Total Cost	393,750.00
** Assume each towel get washed every day (Number of purchases per year)	1.22
365 days /300 washes	
Total cost of ordering Conventional Bath Linens	479,062.50
Saving offered from Eco-Bath Linen	343,890.83

Figure 4: Purchase cost Comparison between Conventional Bath Linen and Eco Bath Linen

Operational and Environmental Impact

Due to the reason that these bath linen do not pile and remain in their original shape, they bring several practical and environmental benefits to the hotel background.

Better guest experience – Bath linen that look smooth and fresh leave a stronger impression on guests, improving their overall satisfaction.

Lower replacement needs – Since the bath linen last longer without piling or losing shape, hotels spend less on constant replacements.

Easier for staff – Housekeeping teams save time when folding and handling bath linen that keep their size and form.

Positive Environmental effect – The ability to use these linen much longer means the hotel won't have to discard the linen early and more frequently. This helps to reduce fabric waste and support

eco-friendly practices within the hotel environment. As one staff member explained, ***“No piling and consistent shape means we can keep these bath linen in service longer, which helps both the hotel and the environment.”***

Analysis with Past Studies

Research on hospitality-related textiles shows that how a bath linen shape and appearance can be just as important as how well they perform. Guests often link visible quality, such as smoothness, softness, to the product's durability and determine the standard of the hotel service itself. Studies on cotton products note that piling is one of the main reasons linen wear out soon, leading to more fabric waste.

The Eco-Bath Linen seems to be addressing these issues and concerns by combining polyester for strength with cotton to ensure softness and comfort. The strategy behind this blend has been highlighted in textile sustainability studies numerous times, where durability and no structural changes are key to lowering costs and frequency of changing the fabrics, which supports better environmental impact. Consistency of shape is also strongly checked at laundry operations. many studies indicate that fabrics that are likely to shrink or lose their original form after repeated washes create extra work for staff and reduce efficiency. Hence, it can be confirmed that Eco-Bath Linen's ability to maintain shape, therefore, not only progresses the guest experience but also lightens the daily workload for hotel staff.

The Overall Interpretation

The results confirm the second independent variable, “zero piling and the consistency of the shape of the linen is correct and has been confirmed by the opinion of the majority of the participants. Both staff and guests have noted that Eco-Bath Linen stayed in good condition, even after repeated use.

- In a hotel setting, this brings numerous benefits.
- Bath linen would look fresh, new, and will remain in a presentable form for a longer time.
- The frequency of replacements and the cost involved will be reduced.
- Guest satisfaction will be improved due to better appearance and comfort.
- Lesser fabric waste impacts the environment positively and improves the sustainability targets of the hotel.

Eco-Bath Linen has targeted one of the most common challenges in hotel operations. With zero piling and its ability to keep up with its shape, the product offers a better solution that lasts longer, works better for staff in terms of their effort to clean the linen, and delivers a better experience for guests. And of these will be able to achieve while supporting eco-friendly goals.

4.5 Sustainable Disposal

Used bath linen disposal is one of the most ignored challenges in the hotel industry. Bath linen are often thrown away once they lose their original shape or feel of comfort, and most of them end up in landfills due to irresponsible disposal, which is mostly often overlooked by hotels. When hundreds of bath linen get replaced every few months or once or two per year, the amount of fabric waste becomes a serious environmental concern. This is not only an environmental issue but also a cost factor for hotels that really push their profitability margins. Eco-Bath Linen can revolutionize the current linen disposal system and give a better solution that could cover both the environmental benefit aspect as well as the economic savings. With the number of wash cycles extending to 300 washes from 120-150 washes, the frequency of the bath linen change would be limited drastically. Also, if the market accepts the product and starts performing well in the market, the product is expected to offer a more sustainable recycling solution that would further improve the environmental protection aspect for the hotels. The concept is to set up bath linen collection points so that once the linen has reached the end of its life, the hotel can return it to a collection point where the bath linen will be recycled in an environmentally responsible manner. Instead of throwing it into a landfill, the fabric will be given a second life through various methods like recycling or repurposing.

Perspective of the Staff

Staff members had a positive impression of this proposed disposal system. Many pointed out that it would give them confidence that the hotel will be doing the right thing. One staff member explained, ***“It will be better than just throwing the linen away, without knowing what’s going to happen after it’s been collected by the waste collectors”.***

“Recycling will make sense for the hotel and the environment as bath linen are one of the fast-moving disposable items that have mostly been questioned by the guests.”

Another pointed out that the system would match the hotel’s sustainability goals, and added that it will be a better solution and a good practice for every hotel, which can eventually be used to improve the brand image also. They further added that old linen often pile up in storage rooms before being disposed of, and this takes up a lot of space and creates extra work as well as a concern for hygiene. With Eco-Bath Linen’s disposal plan, hotels can clear their disposable stock more efficiently and conveniently. ***“The disposal process seems more practical and would save us from the usual hassle of handling the bath linen stock given separately to dispose of”.***

Guest Views

Even though they are not directly part of the hotel's linen management practices, they are the main force behind why the hotel industry started showing interest in investing in environmentally friendly practices within their hotel operations. Several guests mentioned that they felt good knowing the linen they use would not end up as waste, which would be added to the enormous garbage piles, which cause a lot of environmental damage. The majority of the guests showed their displeasure with the fact that they had to be part of this event without their consent. One guest mentioned, ***"It's nice to know the hotel will have an option so that they won't have to throw these linen into the garbage"***. Another added, ***"The recycling and extended usable life ideas both would make me trust the hotel more. It shows they care about the environment and will give me confidence to stay with such a hotel even if the price goes up slightly"***.

Understanding the disposal system seemed important as an operational initiation to give what's best, what guests prefer, and what it gives to nature, and it seemed a more important fact that they want to be given in a transparent manner. This opinion indicated how well this will impact the brand value of the business. The majority of the guests see this concept as an essential part of the hotel's commitment to being eco-friendly. While more travelers want to adopt green options, this feature will add value to customer loyalty.

Benefits of an Environmentally Friendly Disposal System and an Extended usable lifeline

Positive Environmental impact - Less bath line waste goes to landfills, which helps reduce environmental pollution caused by this product line.

Operational efficiency – Hotels can handle their old stock in a better way without having to store it for long time or dumping it without knowing where it would end up.

Impact on the brand reputation – Guests will start to see the hotels as a responsible business entity for selecting an eco-disposal system and will start to attract more attention from the target consumers. "The eco-disposal system concept will be able to help us reduce the environmental damage this causes and handle this in a better way, so that the hotel's image will also be improved".

Comparison with Current Practices

In most hotels today, old bath linen will either be discarded as waste or sold off at a cheaper rate in bulk. Neither option seems sustainable. Irresponsible disposal or handing them to a local garbage collector will not ensure that these waste clothes will be disposed of in an ethical manner. Most of which will end up in wastelands, while selling them does not solve the environmental problem also

as the hotel does not have transparency of how these bath linen will be used. The proposed Eco-Bath Linen's recycling system, where linen are collected and recycled, would give a stronger, sustainable solution. This recycling approach also seems to fit well with global hospitality trends related to sustainability. Also, the number of improved washing turns reduces the amount of bath linen that are disposed of. This also seems to be a positive initiative towards environmentally conscious business improvements. Many international hotel chains are now reporting their waste management practices as part of annual sustainability reports to the general public. Having a clear disposal system for bath linen can help hotels to show their commitment to reducing waste and their measures to protect the environment from possible hazards.

Link to Research and Literature

Research on the circular economy and textile-related waste management points out that fabric waste disposal is one of the main challenges in the apparel and linen industry. Hotels use and dispose of thousands of bath linen every year, and this has become a growing concern as these hotels are mostly unaware of what is going to happen to this waste. Many reports suggest that recycling or repurposing is the best strategy to cut down on irresponsible textile waste and disposal. Eco-Bath Linen fits perfectly into this concept by creating a closed loop as "use → collect → recycle/repurpose," where the company is expecting to maintain transparency so that the hotels can express their knowledge of how exactly their waste bath linen are being disposed of. Many research papers related to hospitality also show that guests increasingly value eco-friendly practices. Waste management is often hidden from the guest's view, but when hotels communicate their disposal approaches, it has been proven that the guest's impression changes from just satisfaction with the service to loyalty. Eco-Bath Linen's recycling plan expects to give hotels a better example they can to show guests.

Overall Interpretation

The study results strongly support the fourth independent variable: Sustainable Disposal method. Both staff and guests showed a positive impression of the proposed recycling system and the transparency it would give to the guests about the hotel. Staff valued this concept for its practicality and alignment with the quality improvements in the hotel operations, while guests appreciated it as proof of the hotel's preference to be eco-friendly. The concept of sustainable disposal seems to be converting a problem into an opportunity. Instead of creating waste, hotels can use Eco-Bath Linen's recycling system to wash their hands of contributing to landfills, support environmental goals, and strengthen their reputation. The results show that this system is not only feasible but also will be well accepted across hotel operations as well as by potential customers.

4.6 Customer Comfort

Perceiving little more than the color and pattern, or perhaps none at all, a guest may not even see the type of paint on the walls or what particular make of carpet it is. But he or she will definitely understand how a bath linen feels against their skin. Also, this study expected to focus on one of the key dimensions under customer satisfaction which is comfort, and is probably the most important characteristic at the hotels being managed nowadays that try hard to stand up against the international competition. No matter how durable or sustainable it might be. If Eco-bath linen can be used in real hotel settings, will users experience the same level of comfort they have with the conventional bath linen? As both the assessment types done with the staff and customers demonstrate, the comfort Level is not just merely well-looked-after but, on many occasions, has been well improved above expectations.

Guest Perspective on Comfort

The feedback from customers was pretty much straightforward, and the sample Eco-Bath Linen product was rated high in terms of comfort.

“These linens are very soft and very comfortable.”

“They were extremely cozy and felt a lot better than I initially expected.”

The majority of the guests also mentioned that the sample Eco-Bath linen not only felt light, cozy, and fresh but also performed well in absorbing water at the same time. One noted, ***“They feel lighter than the usual hotel linen, but of course, they still absorb water.”*** This means comfort goes further than softness. It also influences performance. A bath linen that can dry the body quickly yet is gentle on the skin offers both physical and emotional satisfaction to a consumer. Appearance also seemed to be meeting the expectations of many guests. A bath linen that is fresh, bright, and clean from the looks adds to the feeling of cleanliness and luxury.

“Even after using this linen several times, it still looked fresh and clean.” For hotel guests, how a bath linen looks defines both the visual impression and how it feels. If it looks new and sleek, then probably people will assume it feels better too. Another guest observed, ***“I couldn’t find any furring or roughness of the kind I usually see in hotels.”*** This shows how appearance and feel are closely linked. Guests may use non-technical terms, but they know when something feels different--and better.

Staff Perspective on Guest Comfort

Guests have also shared their responses with the staff members, like housekeeping service, etc., about their experience and their viewpoint on the use of Eco-Bath Linen. A few staff members mentioned as below. The new bath linen had a positive response from guests.

“Guests have told us the new bath linen feel softer than what we used before.”

“Several guests have mentioned that they were happy to use and felt comfortable.”

These remarks are significant to the staff. Hotels frequently struggle to make the best tradeoff between saving money and pampering their guests. ***“A cheaper product, which guests complain about, does little more than raise problems for us, but it also leaves a bad impression about the hotel.”*** However, Eco-Bath Linen was different according to staff's encounters with guests. They were hearing good things instead of complaints. The opposite is true if guests complain about a cheaper alternative that hotels have to offer. Staff also noticed that guests who were down if comfort was not ignored were much more ready to accept the idea of sustainability. ***“From my own observations, I think that guests appreciate the eco-friendly aspect when we explained it. But what made them more interested in listening to this more was that the product also met their expectations. There's no doubt they want both ends to be met.”***

This remark underlines very clearly that comfort is the key to the acceptance of eco-products in hotel operations.

Comparison with Conventional Bath Linen

Traditional cotton bath linen have been used in hotels for decades. They are naturally soft and absorbent. However, these qualities are lost once the goods have been washed many times (just over 100 times). In addition, with everyday use, they become rougher and heavier. Instead of feeling luxurious on the skin as they did when brand new, now one had to hurry to get free of their heavy weight. This change was especially noticeable after only 6 months or so after being given this for foreign guests. This is something that many people have heard of, and so some guests even expect hotel bath linen to be rough or lose their nap.

The recovery effect of Eco-Bath Linen ***“Linen's softness and shape did not change through the trial”***. Guests felt the bath linen were fresh and smooth, even after several uses. Staff also noted that compared with cotton bath linen, guests made fewer or no negative comments about these goods. One staff member said, ***“With the old cotton bath linen, people used to complain about roughness. But with these, we have not yet received a complaint on the same score”***.

The comfort difference was not only in being soft or not, but also in drying performance. The guest said these bath linens were quick to dry, which made it a more comfortable experience. One guest noted so highly of the product. ***“This product remarkably dried faster, just a few hours after my shower, and I liked that a lot. It feels comfortable to re-use a towel which is not too much wet.”*** This practical advantage further increases the all-important factor of comfort.

Comfort and Guest Satisfaction

Comfort was noted as a strongly relatable element to guest satisfaction in the hotel industry. Comfort can be considered as a key aspect of the “Service Quality Model” (SERVQUAL). This concept includes tangible products such as bath linen. The study findings indicate that when the guests are comfortable, they tend to praise their experience with the hotel in a much favorable manner. The people who said the bath linen were comfortable also said they would use them again in the future and that they would like to use them for their personal use if available in the market. ***“I would like to buy this if possible and take these to use them for my daily use,”*** Another added, ***“These are much better than the ones I usually get when I visit hotels.”*** This indicates that if you make it easy to choose a product because of its comfort and then actually buy the item with your money, that same user will keep on doing so.

However, staff also recognized that the feedback from guests about feeling comfortable led to fewer complaints and easier work. Satisfied guests generally do not raise problems, meaning that the service conditions under which staff are serving them are up to their expectations.

Comfort and Eco-Product Acceptance

One of the most fascinating findings is that comfort encourages acceptance of eco-products. Guests have shown a lot of interest in the concept of hotels becoming sustainable, but they will not sacrifice comfort for it. A few guests noted that while they appreciate the Eco-friendly idea, what truly made them feel happy and supportive of this concept was how good they felt when they were using.

For example, one guest said, ***“I like that the hotel is using eco-friendly products, but what impressed me most was how soft and pleasant the bath linen was.”*** This shows how Eco-Bath Linen products have to first pass the comfort test when reaching the hospitality sector. If they pass, guests are more likely to buy and might even favor them over traditional bath linen. The staff realized this, too. As one of the staff members put it ***“Comfort is the name of the game. If guests aren't happy with what they feel, they won't take any notice of the eco part.”***

Link to Literature

In hotel management, comfort often holds an important position in guest experience. Studies have shown that the bedding linen and bath linen are two of the earliest materials in contact between a hotel and its guests. Only when these items feel good, then will guests view the whole stay in a positive way. Further studies indicated that the eco-conscious guests are indeed growing. Most of these guests praised the concept of sustainability and showed positive support. But they were not ready to trade off their own personal expectations on comfort during their stay to support sustainability. The research further validates the fact that guest comfort must go hand in hand with the sustainability initiatives and eco-products. It was noted that these initiatives should further grow in the hospitality industry. The Eco-Bath Linen product gets higher recognition as a product that meets these expectations. Eco-Bath Linen further indicated that hotels can introduce eco-friendly, green, sustainable solutions without compromising the guest comfort and satisfaction. In a real-world scenario, comfort levels of the bath linens are expected to be either similar or at a higher level compared to the conventional bath linens.

Overall Understanding

The study findings indicated a higher level of regard for meeting customer comfort, which covers the fifth independent variable. The hotel guests remarked about the Eco-Bath Linen product as a quality linen that is rich in softness, which made them feel very comfortable even after repeated use on multiple occasions. They also mentioned its refreshing look as well as its gentle feel they experienced, which added more comfort and relaxation, and their sense of luxury. This confirmation was highly noted and regarded throughout the Evaluation results of the Survey. Only a few complaints and concerns were noted but mostly it was praise and recognition of the advanced performances from employees, which they experienced in a way different than for the traditional cotton bath linen.

Comfort can not just be considered as a physical expectation, but rather a significant element that determines satisfaction from consumption. It was this that allowed guests to gradually accept the environmental aspects of products, and without comfort, by simply relying on sustainable use alone would never have been convinced. However, with comfort, visitors at last were willing to accept Eco-Bath Linen instead of traditional-type bath linen and had no complaint about continued use. In summary, comfort is the bridge that links eco-innovation to guest acceptance. Eco-Bath Linen passes such tests due to its high levels of comfort can still be maintained while solutions are more sustainable. Thus, it is not only a practical way for hotels but also one that can add to guest satisfaction and ensure greater loyalty.

4.7 Sourcing and Supply Chain Efficiency

Yet, this is the most forced to accept a challenge that is very familiar in the industry which also doesn't have a fixed method of handling as a solution model. This continuous cycle of aggressive and excessive purchases, frequent quality deterioration, and a struggle to maintain the linen quality to the expected levels. frequent linen replacement, followed by excessive handling of customer concerns. Maintaining enough bath linens requires a series of handling and money-consuming, hideous processes, starting from the point of ordering the linens in the right numbers well in advance. And these linen fabrics need to be checked and rechecked for their quality before they're even sent into the housekeeping section to be put into guest use. This lengthy and detailed process takes lot of time and money, as well as a considerable amount of human resources. As per the traditional methods, conventional cotton bath linen should be replaced very frequently. Each replacement means another purchase order, more supplier communication, and additional costs.

It lasts up to 300 washing cycles while maintaining high quality. Hence, hotels can reduce their number of purchases. This not only saves money but also makes purchasing planning much easier and allows staff to spend more time on other key tasks. In this part of the research, the study aims to understand does this new product actually helps with sourcing and supply chain efficiency if in practice. To find out, the survey included a few questions that aimed at collecting relevant answers to this point.

Staff Perspectives

Through the use of Eco-Bath Linen's staff believes that they don't have to repeat stock ordering cycles more frequently. Or on the other hand, they don't have to maintain a massive stock, which again will have more risks in damaging the quality of the product for storing it for a longer period. Also, the staff predicts that it will be easier to source.

According to one of our employees, ***“Procurement will be easier because the linen lasts much longer.”*** Another person mentioned a benefit of durability, ***“We will not have to order new bath linen very often, or else in our case, we will not have to purchase a massive stock and struggle to keep it in good condition until we get to use it. That’s a lot of money.”***

These are all relatively simple comments, however. As linen lasts longer, staff can save time chasing orders, and Procurement teams will be able to streamline their work as well. Another employee referred to the buying cycle in previous years: ***“In those days, bundle upon bundle of snow white linen would be delivered every few months, and we kept repeating the cycle. Because of this, we try to either order linen in batches so we can manage space well.”***

“We are ordering very often, as the cotton bath linen themselves were spoiling faster than we could put them away.” Not only does introducing Eco-Bath Linen show that there is a financial benefit, but it will also have the ability on operational efficiency. Several employees even took the view that being able to reduce the cost of new stock will be a good saving. ***“You save money because we don't need to buy so often.”*** This coincides with cost effectiveness and also sheds light on how efficient the supply chain will become when order frequency and the level of urgency are reduced.

Guest Perspectives

Billions of kilograms of used bath linen get collected as garbage in an uncontrolled manner every year. But their understanding of how Eco-Bath Linen will reduce the frequency of re-ordering and noted that it will improve the efficiency of the chain management function. If guests had rejected a bath linen, hotels would have been forced to replace the rejected bath linen item or would have had to use more softeners/detergents to keep it usable, at least for a few more cycles. This whole function will become much more complex. But if most guests are willing to use or accept Eco-Bath Linen, they understand that the supply chain efficiency will be improved, while they don't have to compromise their quality expectations from these bath linen.

“All of my roommates had traditional cotton bath linen, but I'd rather use these now. As it not only gives me comfort, but now I understand how the whole hotel operations will be impacted by this change of products. It's a good initiative.” One said, ***“I'd certainly select this product over a usual bath linen again if I get the chance. This will be a good operational revolution.”*** This kind of acceptance means that hotels can move completely over to Eco-Bath Linen without having to worry about guest resistance. Indirect procurement efficiency. The right match between demand and supply will be easier to handle than handling massive excess stocks to be replaced whenever a linen gets out of use.

Comparison with the Conventional Bath Linen

The useful life of a traditional cotton bath linen is short, which is about 150 washes, after which or way before that the linen will be discarded. So commercial users of this commonly used product roughly have to order twice as much as they need to order for Eco-Bath Linen, which lasts 300 washes. More orders also mean more paperwork, more communications with suppliers, and higher shipping charges, which causes a massive cash outflow more frequently. Employees made a direct comparison of this situation. One person said, ***“We can reduce the number of orders with this product than what we do at present.”*** Another commented, ***“This product streamlines procurement.”*** The flow of order charts against the impact the Eco-Bath linen can cause by improving the

usable period shows that the procurement costs can be reduced drastically, making it easier for employees to plan the purchases without much hassle.

Operational Benefits from Supply Chain Efficiency

The research result identified three advantages of better supply chain effectiveness.

- Reasons for the increase in hotel linen efficiency from new supply chain management include fewer Purchase Orders.
- Less storage pressure as stock lasts longer, and there is less incentive to overstock.
- Procurement and housekeeping staff can balance their other key tasks while efficiently managing the bath linen handling task, instead of running after frequent linen orders and replacements

“When the bath linen lasts longer, we can plan our work better, no frequent quality checks, no frequent guest complaint handling, etc.” As it predicts, this product seems to have raised hope among the staff to lessen the hassle they go through and to be able to develop a smooth work process.

Literature Review

When studying hotel operations, a common focus is on procurement, as it is often the silent killer of the hotel budget. Similar to the food and cleaning supply items, all linen products are strictly “nonnegotiable” items. And the quality cannot be compromised at any reason. Studies prove that reducing the frequency of purchases not only helps the hotels to save money but also helps to streamline the administrative hours, as well as their service output quality. Efficiency in procurement is linked to the hotel’s initiatives, which focus on environmental protection and wellbeing. Fewer purchases lead to fewer batches of deliveries, which indirectly helps lower the greenhouse gas (GHG) emissions during the transport and manufacturing that are specifically caused by developing and delivering these products to the hotels. This equates supply chain effectiveness to general attention for our environment. This is supported by Eco-Bath Linen, which decreases procurement through its longer life span.

Overall Interpretation

The results indicated strong support for the sixth independent variable, “sourcing and supply chain efficiency”. People from different departments consistently indicated that purchasing has become more convenient now, with greater attention given to the storage utilization improvement, and a plan for inventory within equal intervals could meet the future orders in a hassle-free manner. This idea was supported indirectly by visitors who accepted the product without hesitation. The quality of storage is also important as the product is related to hygiene, so the hotel has to give higher care in

storage and stock maintenance. With the proposed product, this exercise will no longer be a challenge. While this is under implementation, this means that hotels that choose Eco-Bath Linen can simplify their supply chain's function, reduce hidden costs, and enhance the sustainability aspect of the procurement and stock handling. The product was also noted to be more environmentally friendly because it lasts longer. Staff in charge of linen supplies seems to have a greater interest and support in changing the hotel linen to Eco-Bath linen.

4.8 Cross-Theme Discussion

As for independent variables, the research discussed variables like durability, pile, and the consistency of the shape, price efficiency, procurement aspect, and sustainability. The project allowed to express the opinion of the guests as well as staff involved to understand how these concepts would really make sense to increase the product demand potential for the product.

The section expects to join the research results of all of these independent factors in order to see how they intersect. It is important to put together the results because in actual practice, hotels never consider durability, price, comfort, or sustainability alone. These are the elements that influence an integrated decision. A durable bath linen that is tough on skin will not make it. What the research is expected to understand is whether the product has the right level of incidence and impact for the hotel to select Eco-Bath Linen over conventional bath linen.

Staff Vs Guest Perspective

From the findings of the study, it became obvious that there is a noticeable concern among the staff about the current way of handling the bath linen due to their higher delicacy of getting the fabric destroyed if not handled carefully. Also, the guests are concerned if not met the comfort they expect from the bath linen. And the hotels have to make sure this requirement is met, as it can cost the reputation and the revenue streams of the hotel if not.

Staff commented, ***“Mostly staff talked of endurance, purchase, and cost, but to the guest, the bath linen are a sensitive point that adds a sense of comfort, even though it's a monotonous routine.”*** It was also noted that ***“Purchasing the right quality fabric is important as we can't compromise the human perception.”***

Guests were interested foremost in comfort and appearance. They used words such as soft, pleasant, modern, or fresh when the staff asked the guests about Eco-Bath Linen. One guest mentioned, ***“The bath linen are very soft and nice on your skin.”*** Another, ***“They looked as fresh as new even after several days' use.”***

Staff run hotel operations from behind the scenes while guests come into contact directly with the front end. The difference in perception and their priorities is different seems natural, but it is necessary that they find a balance between the organization's expectations and the guest's expectations, where both can be met in the best way possible. What is promising is that Eco-Bath Linen would seem to meet the requirements of both groups, up to a satisfactory level. Certain aspects of both these parties were noted as similar. Only in a few segments did the staff (representing the hotel) and the guests' interests noted to vary. Staff and guests both noticed and approved of the sustainability vision of Eco-Bath Linen. Staff were grateful for the eco-disposal system and its reduced waste from longer lifespans. Guests noticed this as a good initiative of the hotel using green products. One said, ***"The hotel is more trustworthy because you have a recycling idea."***

There was another overlap in appearance. Shape consistency saved time for staff in folding and display work. To guests' appearance related to comfort. If the bath linen look new, both the staff and guests feel a sense of quality and comfort, while it meets two different expectations.

Link Between Durability and Price Efficiency

The first three independent variables were durability, consistency of the shape, and price efficiency, which were noted as closely connected to one another. When the staff were asked for feedback, these were the ones they most often brought up in combination. A bath linen that lasts 300 washes (durability) and does not pile or shrink (shape) automatically becomes cheaper to maintain (price efficiency). It means hotels are not saving money in only one but three ways at once. Buying fewer bath linen, spending less energy and time to dry them, and reducing the procurement workload in buying bath linen all seem to be addressed by this product more efficiently than the current product available.

The responses highly support this statement. One staff member mentioned, ***"The fewer replacements, will help to handle the funds more efficiently. This will also be a better cost-saving options.*** Another shared their opinion, ***"Having fewer linen replacements will support the hotel in multiple ways, such as improving cost efficiency and encouraging ecological sustainability through a controlled number of purchases and use of the supply chain."*** These perspectives illustrate how one positive initiative can shape and support the betterment of many more linked aspects at once.

Link Between Appearance and the Guest Acceptance

Comfort can be considered as the bridge innovation with broader acceptability. Whether or not they were willing to purchase or use Eco-Bath Linen again, all of the guests shared their frank opinion about how comfortable it is. They praised the soft touch on their skin, feeling, and fresh look. Natural

comfort, but some said that this is a key measure that determines the priority the guests are being given. A guest summed it up as ***“I prefer this sample product as much as I like to usual cotton bath linen. Sustainability is fine, but I want to be comfortable during my stay regardless.”***

Hotels can record a cost saving or environmental goals by using an eco-friendly linen brand, but unless the guest feels comfortable, none of that matters. Therefore, Eco-Bath Linen will continue to work well in this context, where this product will meet both the needs exceptionally well compared to the conventional bath linen that are commonly in use at present.

Link Between Sustainability and Brand Reputation

According to both staff and guests, the waste-disposing mechanism impressed them. For staff, it was of practical benefit to have this, such as piling used bath linen for a longer time without either throwing them away or making arrangements to hand them over to a good cause. For guests, this was a kind of disposal system that made their impression of the hotel even higher. This is a clear indication that sustainability is not just about reducing the amount of waste, but it is also involves improving goodwill and reputation as well. However, it should be noted that sustainability is a highly demanded factor globally, and it's high time Sri Lanka takes the necessary initiatives before the global tourism industry stresses about it.

One guest shared their opinion, ***“This concept of sustainability really impressed me. Recycling the used towels rather than carelessly throwing them away is a good cause. We talk big about environmental protection and sustainability, but this is a very good initiative that supports the business and the environment in many ways. I think this is a very smart approach.”***

This type of statement indicates an expectation that product-level sustainability will correspond to overall hotel values. A hotel that is eco-friendly in terms of its bath linen will be seen as a more responsible entity. Clients are influenced by such brand reputation, and this has an influence on repeat reservations.”

Tension and Trade-offs

Most feedback was positive, but possible challenges remain to be considered. Although handling of bath linen places a bigger burden on cleaning staff, the guests are the ones who demand comfort and softness. The staff said, ***“If this saves money, it's important. at the end of the stay, the client would say softly and still pleasantly. But if we have to pay a massive amount to reach that client satisfaction, I think we have to find a balanced way to meet both these expectations.”***

When a product is at risk of compromising soft feel against durability, the guests have no space to stress their expectations as the end of the day, this cost will return to their bill. The positive thing is

that Eco-Bath Linen seems to be a balanced solution. However, this balance is always difficult to maintain in the hospitality industry due to the higher level of bath linen consumption, where 300 washes will be completed within less than a year. So the repeat number of orders is not stoppable. But what's controllable is the number of orders that happen within a year and the level of unexpected replacements that happen due to piling and other mishaps.

The link between the Dependent and Independent Variables

The dependent variable of this study was the potential demand and acceptance of eco-friendly bath linen in hotels. Looking across all themes, a strong demand can be seen for this product. Staff accepted the product as it was easier to take care of and maintain, also it was recognized as a more durable and cheaper option in the long run as when they have to buy 2 conventional Bath linen for one year (assuming the linen remains usable even with piling) they will only need 1 Eco-Bath Linen for this same period. Guests accepted it because it was comfortable, fresh, and well-made. Their preference for the sustainability aspect was optional for most, but they were obviously impressed by the effort given by the product and by the hotel for considering this product. Acceptance by both staff and guests makes this product prospect a promising one. If either had resisted, adoption of this product indicates that the product is not feasible. But the field trial only shared a positive direction to promote as a commercial product.

Overall Interpretation

This study's findings conclude with results that are consistent and in line with the majority of the previous studies related to similar developments. However, Eco-Bath Linen indicates more competence than any other development, as far as the study results indicate.

- Quality in the minds of guests, through feeling and looking comfortable.
- The staff need efficiency and durability to keep all operations smooth.
- Sustainability is the value addition for the hotel to promote itself to the international market and for the eco-conscious local guests.

Eco-Bath Linen broadly supports these three points mentioned above. They indicate that one can achieve expectations, namely, meeting the guest comfort, improved efficiency, and meeting the sustainability aspect at the same time. This is not an easy task to achieve in one go. The majority of the studies indicate that a polyester-based bath linen not only increases the level of durability and ease of handling of the linen but also improves the overall quality of handling and user convenience. The participants have highly indicated their interest and enthusiasm in this type of eco-friendly product as it is more durable, maintains a better consistent shape, and is also cheaper in terms of the extended usable lifespan. The aspects of comfort, style/design, and eco-consciousness make this

product the right choice for customers. Hence, these themes discussed point out an overall acceptance of the product with a clear understanding of its direct and indirect benefits to the organization, users, and the environment. This means that the Eco-Bath Linen product is more than just a mere bath linen, but a sustainable product that supports cost saving, is eco-friendly and comfortable, and is a consistent product that has gained the majority of approval from all ends of the users. The product indicates a lot of potential in terms of changing how employees can handle linens, maintain them, and better use them to entertain the guests to improve their experience. This combination seems a must-have for hotels.

4.9 Summary of the Key Findings

In this section, the study findings were evaluated to determine how well the identified independent variables respond to the potential market acceptance of Eco-Bath Linen as a comprehensive solution for the flaws of the current conventional bath linen. The study findings were viewed from the six independent variables identified in the research. The discussion was carried out with both the staff and the guests to get an impression of both parties who would determine the demand levels for bath linen. The outcome of what staff as well as guests think was also cross-checked with the past studies to ensure whether both express the same. Staff repeatedly mentioned that Eco-Bath linen products were more long-lasting and looked just as new as it was for a longer period of time until the very end of their usable lifespan. Guests also expressed their opinion that the Eco-Bath bath linens stayed fresh and cleaner during their stay, which improved the quality of their experience. Eco-Bath Linen has proven to have a much longer life span and usability. This generates less waste while saving on expenses.

The traditional cotton bath linen is known to generate small fiber balls, losing its shape after several washes. Eco-Bath Linen, however, has shown such changes. Staff were pleased as it was easier to handle and the bath linen could remain in better shape for a longer period than conventional bath linen after the same number of washes. And noted that it was easier to handle and could be given for the guests to use for a longer period. Guests appreciated this product for its smooth touch as well as its neat appearance. This made the product indicated as a more competent version that helps hotels to serve the guest right while keeping their cost and maintenance under control. The third finding was the effect on the price efficiency. With the Eco-Bath linens being able to be used for as long as 300 washes, hotels do not have to buy new ones repeatedly in short gaps. The Eco-Bath linen product was also recognized as a product that dries faster. This reduces the energy consumption levels. Staff pointed out that procurement and SCM handling had become much easier and less frequent, with a lot of cost savings for the hotel and with better pre-planning on purchases. Guests

didn't talk about money, but because they accepted the product, hotels can introduce it without risking complaints.

Sustainable disposal was the fourth variable. The recycling system was popular among staff because it offered a practical method of dealing with old bath linen. To guests, it represented yet another proof that the hotel was environmentally aware. From this, it can be seen that the disposal problem is not simply a task of managing waste, but touches on brand image. If a hotel can practice such measures, guests naturally trust it more. The fifth finding was that of customer comfort. This was the key factor, and it was also most appreciated by guests. The bath linen were described as soft, nice, and fresh. Staff reported that guest feedback on the new bath linen was good, with fewer complaints than cotton bath linen. The key to acceptance for guests turned out to be comfort. If these bath linen were not comfortable, sustainability alone was not good enough. With comfort, guests are now willing to go for and even like the new bath linen.

The sixth variable addressed the sourcing and supply chain efficiency of staff. Staff pointed out how order procedures can become smoother. They were confident that they would not have to clear stock as frequently as it is now. The burden will also be less, and it will be easier to plan purchases way ahead. Guest support for this element was indirect, as it doesn't involve them. However, the staff noted that maintaining a necessary amount of stock with a little bit of additional stock so that they can quickly change the piled or misshapen ones with new bath linen without causing the guests to feel uncomfortable. Across all variables, one clarifying pattern stood out. Staff stressed durability, cost, and procurement. Guests put most emphasis on comfort and appearance, however. Both groups valued sustainability in their own way. For staff, it was a matter of practicality (fewer leftovers, easier disposal), and for guests, it was the image and trust they could have about the hotel.

The dependent variable in this study was demand and acceptance of Eco-Bath Linen as an eco-friendly bath linen solution to the mishaps of the current bath linen. The findings showed that the product can expect a positive demand, and market acceptance with a higher reliance as a comprehensive solution for the flaws that have been pressured by the conventional bath linen over the decades. A double acceptance by the end user and the service provider (hotel) for this kind of product is crucial because hotels have to serve what the guest prefers. This has been the reason why the conventional bath linen has been surviving in the market for this long, regardless. Hence, based on the study results, it can be confirmed that Eco-Bath Linen will have a higher potential in accessing the hotel market and achieving a considerable space. However, it should be noted that the conventional bath linen have already set a strong presence in the market, which will take time and a lot of recommendations to establish a market position. Hence, it will be necessary to develop a strong and tasteful marketing approach to win the market based on the confidence this study was able to offer.

5 Chapter 5 - Conclusion and Discussion

5.1 Introduction

The chapter brings the research to a close by combining the key findings and explaining what each variable means in an actual work setting. The previous chapters described how the study was planned, its theoretical background, research results, and the discussion of key findings. This study aimed to determine whether Eco-Bath Linen could give both economic and environmental benefits in hotel operations while living up to guest expectations. With a short life, high water and energy consumption demand, and undocumented frequent disposal issues, the current conventional bath linen has received a relatively negative impression. However, the hotels continue to operate as meeting the guest expectations is a must for their survival.

Their views on procurement, laundry, and cost gave an operational perspective of the product, while feedback on comfort, appearance, and its acceptance by guests converted these voices into users' judgments about the product. This feedback, both positive and negative, was able to be analyzed to determine the primary level of market acceptance that can be accepted by Eco-Bath linen. This understanding is important prior to taking the initiative to launch the brand to the mass market.

In Chapter 4, the discussion was based around six independent variables: durability, zero piling and shape, price efficiency, sustainable disposal, customer comfort, and sourcing and supply chain efficiency. The dependent variable was the potential overall demand and acceptance by the Hotel industry. The study indirectly examined how well Eco-Bath Linen seems to be performing in comparison to the currently used conventional 100% cotton bath linen.

5.2 Conclusion

Improvement in Durability

This study provided one of the most convincing results of all related to longevity. The time to reach this stage is not fixed and mostly happens way before the expected 150 wash cycles are completed. This situation is happening frequently as the bath linen get washed every now and then, making the wear even faster. As one participant put it, ***“cotton bath linen spoils easily and constantly needs to be replaced.”***

They kept their warmth, as the overall experience suggests it remained soft and fresh to use after a number of washes. And the staff members were confident that the product is more durable by comparison. One participant summed it up ***“They look newer for longer.”*** Guests also saw the difference as several described how neat and fresh their bath linen stayed throughout their stay. Its

agelessness within the usable cycle reduces waste in parts, decreases expenses on the whole, and provides a more reliable output for hotels.

Zero Piling and Consistency of the Shape

Another key improvement noted during the trial period was the fact that the bath linen no longer curled or caused any piling and was able to maintain its shape. This is a common challenge with the cotton bath linen as the fiber is too gentle that it can't stay in a consistent shape for a longer time. This is also a reason why the cotton bath linen are softer at the beginning and gradually start to wear out even before they reach their lifetime. Even though the fabric is delicate, the fabric will start to look messy and give guests a most unfavorable impression.

Staff immediately pointed out that Eco-Bath Linen did not have this problem. ***“No piling has taken place so far, which is different from cotton bath linen that usually piles after just a few washings,”*** one employee said. They noted that the bath linen kept its shape, helping staff in guest rooms to fold it more easily and giving guests a direct compliment on the bath linen. The final conclusion from all this feedback is that Eco-Bath Linen has avoided two standard quality problems, which is piling and deformation. This model bath linen appears to remain more professional in appearance, gives a better impression to guests, and is easier for staff to handle.

Price Efficiency

. These costs are not only in economic terms; they also include frequent replacement cycles, high laundry charges, and the energy used. Some staff members said several times that the new bath linen would reduce costs. ***“If you do less renewal,”*** one person said, ***“that must mean clear savings.”*** The bath linen dry much faster than cotton ones, and that cuts laundry work and energy costs. The staff emphasized this point, saying that drying times were shorter and low energy was needed to dry them. Procurement staff were glad that they would be able to order new stock as rarely as possible. This will reduce their administrative burden and will help manage the hidden costs. This gives value-added meaning to cost-effectiveness, since this can be achieved without any negative trade-offs at all. Therefore, in three ways, Eco-Bath Linen saves hotels money, fewer replacements, uses less energy to wash and dry, and has to make fewer procurement cycles. In this way, the product offers a sound financial payoff.

Sustainable Disposal Methods

With the bath linen reaching the end of its life, it can be returned and sold back to get a discount and be able to ensure it is disposed of in an environmentally friendly manner. These product users will be encouraged to return these used bath linen to collection points set up around the country. This is

a far cry from how things work with the cotton bath linen segment. Generally, the merchant doesn't look after post-consumption and the disposal aspect, as they already have a demand. And it doesn't bother for the fact that these bath linen end up at landfills or else some wholesaler buys scrap fabric. Staff, on the other hand, found this scheme to be practical when disposing of old bath linen. A staff member said, ***"This way is better than simply throwing them away. Both the hotel and the environment will be benefitted greatly from responsible fabric handling and recycling."*** The majority of the guests shared a positive reaction. They liked the fact that the hotel was trying to reduce the waste and dispose of it in a more responsible way that serves as a he environment right. One guests has noted as; ***"The idea of used linens send for recycling makes me feel good staying here. It felt that I have selected the right place to spend my vacation. I feel more comfortable now that I know I contribute to a good company to do a good cause"***. Regarding the mechanism of waste disposal, the impact it created on the hotel's reputation is just as significant as its actual operations. By adopting sustainable waste disposal, hotels enhance their image as respectable businesses. Hence, Eco-Bath Linen can be considered as not just a commodity that highly meets consumer expectations but also provides value to the hotel's reputation that supports beyond their normal operational tasks, objectives, and helps them to improve their image as a reputed hotel in the industry.

Customer Comfort

The most important and most demanded factor for the test guests is actually the level of comfort they experience. Taking a cost-effective or sustainable product can be worthless and most likely to get rejected if it makes people feel uneasy and uncomfortable, as they find it hard to adapt to. In such instances, the chances of success and customer acceptance is very slim. One of the guests said, ***"The bath linen were very soft and comfortable against my skin."*** Another said, ***"Even after using them for several days, they still looked fresh and clean."*** Staff also supported these views based on their conversations with the guests. The majority of the guest responses were good. Staff also admitted that guest acceptance largely depended on comfort. One of them commented, ***"The difference is comfort. If the guests are not satisfied with how it feels, they will not care about the ecology."*** Hence. It can be concluded that Eco-Bath Linen has passed the comfort test, which is indispensable in the hospitality industry. Comfort not only encourages acceptance but also brings guest satisfaction and loyalty.

Sourcing and Supply Chain Efficiency

. Cotton bath linen wear out quickly, forcing members of the procurement staff to place frequent orders. They have a lot more work and significantly higher costs as a result. But as Eco-Bath Linen lasted longer, there was less need for orders. Like the ones described, the staff gave very positive

feedback. The three comments show that the product has high expectations to simplify supply chain management and reduce workload for staff. This is not just a matter of a new product's reputation or the qualitative aspect, but it also reflects savings and benefits.

Guests have no direct interaction with the procurement tasks, but their acceptance of Eco-Bath Linen will certainly support the supply chain efficiency. However, hotels would have had to manage both types of bath linen if guests had resisted it. But as the product gets a high approval rating from guests, hotels can gradually standardize with one product and thereby simplify their supply chain management function with fewer complications and fewer reserves for additional bath linen, which is currently being used to replace the piled or deformed bath linen as and when they appear. The conclusion of Eco-Bath Linen procurement is that the product cuts costs at hotels, reduces staff workload, and makes them enter a virtuous circle.

Demand and Acceptance of Eco-Bath Linen

Results of this study strongly support the statement that this product has given promising results that it has the capacity to meet the overall expectations. With immediate approval from both hotel staff, management, and guests, the product was noted as a feasible bath linen solution to overcome the current challenges and streamline the bath linen management function of a hotel. Hotel staff accepted the product because it saved them from going through the trouble of frequent purchases, fluctuating rates for instant purchase, and the likely cost of overstocking linen. The product also had attention from its users for its comfort and long-lasting shape. because it was refreshing on the skin, bug-free, and environmentally friendly, one guest said, ***"I would definitely use this next time I visit again."*** Another, ***"I don't mind that the hotel is using green products, but what really impressed me was how soft that wife cloth felt drying myself with magic!"*** These comments indicate that acceptance of the product, while not yet widespread, was not just a matter of theory but actual practice. Guests actually would be willing to use it again. In conclusion, there is a genuine demand potential for eco-friendly bath linen as long as they are both sustainable, price-efficient, and comfortable. Eco-Bath Linen strikes this balance and indicates a positive vision that it can be adopted widely in the hotel industry.

In reviewing all six independent variables and the dependent variable against these 6 variables, it can be concluded that the Eco-Bath Linen product exceptionally meets the expectations of both hotel staff and guests. The product has proved its strength to ensure durability, with zero chances of pilling while holding its shape. This also proves to be saving money indirectly by reducing the amount and the frequency of purchases. Reducing waste with their sustainable concept while giving comfort to the users consistently. More importantly, both hotel staff and the guests have accepted it on their own terms, recognizing how this product meets each of its specific expectations. This acceptance

and common ground about meeting the overall demand of both the hotel and the guests makes industry-wide feasibility for adoption. Also, the product brings new opportunities for hotels to improve their good name in the industry without compromising the service quality. This is a very rare but significant achievement where sustainability initiatives often appear to conflict with guests' expectations of comfort. Eco-Bath Linen indicates it is feasible to meet both ends successfully.

5.3 Recommendations

From the results of the pilot test, it can be noted that Eco-Bath Linen is not only strong and environmentally friendly but, more importantly, pleases the guests. In the first step ahead, it should be planned how hotels can convey these findings and develop confidence to experience these discoveries on their own to make the drastic conversion. The next steps should be to think from the hotel's perspective on how they will use such findings to make strategic decisions for the business. The product can provide certain suggestions to hotel managers, purchasing departments, and sustainability officers in their respective focus areas. Also, they will help the suppliers who promote Eco-Bath Linen to enter the mass market easily. Currently, the focus of these recommendations ranges from daily operations to finances, the guest experience, and branding but the management of environmental issues still remains an issue.

Recommendations Related to Operations

At first, hotels can be introduced to initiate a pilot test similar to the wash test to determine the results of the usage. A forecast for an immediate replacement of all bath linen at once can be both expensive and high-risk for a hotel, which will not be achievable until the brand establishes a significant market presence. Rather, they can be convinced to start with the trial phase; in a way, it's convenient. All staff need to be trained and made aware of the product's features and how the stock should be handled, so they will understand methods to stock the old ones to send for recycling and to continue to use them up to 300 washes. At the launderette, the staff have to follow the same procedures that they use for the normal cotton linen, which will keep up to some 300 washes. But if they go about it in the wrong way or handle them carelessly, chances are that the linen will not be able to reach its lifecycle. In order to handle the bath linen cleaning process better, a brief training can also be arranged to educate them about the correct temperatures, time taken for drying, and ways of folding. House-keeping staff should be given proper training so that they understand a better way of linen handling, which will also ensure the product lasts well up to its usable life. Regular communication and feedback can help sort out any sort of resistance.

Financial Recommendations

Eco-Bath Linen can be recommended as an investment for hotels, not just a purchase. Management can evaluate this cost saving over a 12–24-month period to determine the real financial impact.

- The cost per wash must be calculated to do this. For example, Cotton bath linen may be cheaper to start with, but it only lasts 150 washes.
- Eco-Bath Linen lasts 300 launderings, which almost halves the price for each wash.

Simple spreadsheets should be set up by hotels to keep count of how many times laundry has been done, the frequency of procurement, and when to expect replacement cycles. Staff will be most likely to grasp the financial value of the product if these results are shared in internal meetings. Savings should also be reported in the hotel's budget reviews and sustainability reports. This allows hotel management to justify their move to stakeholders and owners.

Guest Experience

The research points out that comfort is the main support of Eco-Bath Linen received from guests. Hotels, therefore, should mention that they are offering a premium choice of the product, not compromising on it. Some practical measures can be included as follows.

- Educating the front office staff and the housekeeping staff to verbally communicate about the comfort as well as the environmentally advanced nature of this product during their friendly conversations with the guests.
- The hotel can promote and publish the sustainable initiative with Eco-Bath Linen via platforms like the website or any other marketing materials that endorse ecologically sound living.

Keeping the message simple is crucial. Guests don't want to hear technical details about fiber blends or laundry lives. Instead, they should be told that the product is "soft, fresh, and better for the earth."

Branding

As part of the eco-branding strategy, hotels can use Eco-Bath Linen to promote their brand as a responsible hotel. Many hotels have started promoting their initiatives on energy saving, recycling, or even plastic-free initiatives. As far as guests are concerned, the more hospitable a place, the better. Those who appreciate sustainability are more inclined to stay in hotels that take real action. With Eco-Bath Linen as an integral part of its brand story, hotels will be able to attract travelers who think about the future and feel quite at home with themselves environmentally.

Environment

Hotels will have to add Eco-Bath Linen to their suite of sustainable measures. It has been said that bath linen are only part of a hotel's work, but they are something guests can see what hotels do. Hotels can establish a full profile of sustainability by combining their other green project initiatives, such as water-conserving shower installations and energy-saving light circuits. For instance, by comparing water and energy consumption before and after changing to Eco-Bath Linen, management can figure out the energy saving levels. Results like these should be included in the hotel's annual sustainability reports and promotional material. The hotel recycling program can also be promoted, including these details. Guests should be informed that old bath linen are not discarded but returned to the supplier for recycling, which will further add value. The hotel's responsible image is further enhanced.

Suppliers and Industry Patterns

In order to make things easier for Supply chain management, Eco-Bath Linen can also do some groundwork before launching to the market. The brand should check the possibility of offering the following.

- Training guides Specialists in laundry and housekeeping work
- A few sample materials that hotels can use to explain the new product to guests, if preferred
- Discounts fulfilled economies of scale, conserving resources by turning in old bath linen if it amounts to enough.
- Customer feedback and cost-savings data from hotels should be gathered by suppliers. This information can then form a basis for further improvement of the product, as well as for promotion to new hotel customers.

Challenges

Although the feedback is mostly positive, not all hotels will be willing to adopt Eco-Bath Linen. An example is that they may have been using cotton bath linens for decades, or maybe they have doubts about switching to another product, or perhaps it is just an expensive venture. As a brand, Eco-Linen can overcome this challenge in the following ways.

- Introducing a test period to give confidence to hotels that show reluctance to be based on the previous testimonials.
- Presenting reports and feedback from both the guests and the hotel management to ensure the deliveries.
- Taking advantage of data on cost-per-wash to ensure long-term savings.

If hotels can get these issues settled early on, then the transition will be all the easier for everyone concerned.

Contribution from Secondary Sources

The research project is expected to extend the understanding of a method that could overcome the challenges faced by consuming conventional bath linen. The Eco-Bath Linen study is not only useful to hotels in practice, but it also contributes to academic conversations. Its contributions can be seen in five areas. "Hospitality, Sustainability, Hotel operations, Textile and circular economy study, and Customer satisfaction". Much of the research on sustainable hotel operations has focused on large systems like energy management, water conservation, or reducing waste in food and drink. This study shows that even small everyday objects, such as the handling of bath linen, play a key role in sustainability. By proving that the Eco-Bath Linen system saves water and energy, reduces other textile waste production, and extends the useful life of materials. The study is believed to have extended the scope of sustainability in the hospitality industry. It gives an indication that the environmental impact is minimizable through cost-effective initiatives such as Eco-Bath Linens.

This is a significant milestone for the sustainability of a hotel when it comes to finding a solution to the untapped cost driver of any hotel. Sustainability in the hotel industry is not merely the transformation of the entire system of operation, but also the embracing of a solution product that will deliver solutions to all the components of the problem that interact with each other. In accordance with the research, there is literature that talks about the cost-effectiveness of hotel management theory. The research is valuable to the literature on Eco-Bath Linen due to its design and its effects on the supply chain efficiency. The other finding was that it is possible to streamline the procurement processes and make purchases less frequent and smoother. This comprehends another aspect in the estimation of operation and unseen costs. This provides a fresh dimension of cost management in the context of efficiency of the supply chain. It means another way of saying that you can make the system work better just by changing products.

The research is also relevant to the discipline of circular economy-related research and study of textiles in general because Eco-Bath Linen best qualifies as a product of long-standing and recycling policies. The staff and guests' answers exhibited that people were also pleased about this. This result is backed by providing an actual example where sustainable practices can be directly combined into the hospitality industry. It supported the argument that products designed with a structured plan for disposal are necessary to achieve sustainable systems.

Previous studies have concluded that comfort and sustainability are a pair. Therefore, guests expect both. Eco-bath linens have received favorable attention as they try to combine comfort and

sustainability. Customers do not want to sacrifice their comfort to benefit a larger population. The outcome is one of the indicators of the consumer theory that states that the market acceptance of a product is based on its serviceability and quality of use. The product talks about the acceptance of recycled products by guests by providing the same combination of expected comfort and environmentally friendly behavior.

5.4 Limitations of the Study

The study was based on the feedback from 15 hotel staff members and 15 randomly selected guests. Though the responses were rich and meaningful, this small sample size limits the broader usability of the findings. In a vast industry like hospitality, where thousands of hotels function with systems that are all so different from one another, a larger sample would have formed a more reliable study finding. With more data from staff and guests, the results could have been compared across different roles, age groups, or types of guests within different hotel settings. This small sample means that the results should be treated as providing only a general indication about the market feasibility of the product.

The research took place at a hotel in Mahiyanganaya, which gave the study a strong focus and a realistic setting. Relying only on one hotel limits how widely these findings can be taken as applicable for hotels in big cities, luxury resorts, or budget chains, which may face quite different challenges. For example, a five-star resort may demand higher comfort levels, while a budget hotel will not be the same. Because the trial was carried out only at one hotel, the results can't be automatically extended to all kinds of hotels. It would take more sites to give a wider view. This was long enough to collect early impressions of them, but not the full 300-wash lifespan claimed for the product. Though their comments on initial performance were good, longer-term durability still needs confirmation. A longer trial period would have provided more reliable evidence about how the bath linen performs after months or even years of use. Without it, some of the conclusions are still based on assumed results rather than ones already fully observed.

While most participants were honest, self-reported data can sometimes be biased. Guests will tend to give more positive answers out of politeness, and staff might answer as they believe management wants them to. This means results may fail to capture the full range of opinion. For example, a guest who noticed anything negative may well not have wanted to mention it. Using more objective data, such as energy meter readings or laundry cost reports, would have brought higher precision to the findings. Although the study considered price efficiency, it did not include detailed financial records from the hotel.

The analysis was based on staff impressions and expected savings rather than hard numbers. Without sight of actual purchase costs, laundry payments, or long-term replacement data, it is hard to calculate the precise financial savings. This means the study could not give precise figures for cost savings. Instead, it is suggested that savings are probably achievable, backed by staff observations and logical comparison. Hospitality is a diverse sector, with different locations, cultures, and hotel categories. What works in Sri Lanka may not work in Europe or the United States. Nor are guest expectations consistent. Westerners may be more sensitive to sustainable issues, with guests from other regions caring more about price or comfort. Consequently, the study's conclusions should be taken with caution. They represent an interesting snapshot but require further research in other settings to confirm them. But overall, the study shows a higher possibility of market acceptance and product feasibility to showcase Eco-Bath Linen as a competent alternative and a good solution for all of its flaws.

5.5 Suggestions for Future Research

This research provided an early understanding of how Eco-Bath Linen actually performs in hotel operations. The findings were reassuring, but given the assumptions, there are still some areas that need to be addressed. Future research notes: Researchers could build upon this work by conducting a more extensive test of the product in different settings, using larger sample sizes and gathering more objective data. The following suggestions just hint at how new studies might extend these data.

The 30 participants in our sample delivered good results, but it does not represent the industry. With hundreds of participants, researchers could compare age groups, types of guests (business versus leisure), and different job functions (housekeeping versus procurement). Tests of different hotel categories would also be helpful. Three examples are budget hotels, boutique hotels, and luxury resorts. Different hotels and property types have their own standards and priorities, so the product might not fit well in every area, in every setting. This diversity will produce a clearer picture of the level of deviation of potential acceptance.

The present study covers only a limited trial period of just two months. This has given only short-term results. Future research could ideally run up to six months to a year, or until the bath linen reaches its full 300 wash cycles. This will test durability-related findings more accurately and show how the bath linen holds up under heavy use over its full usable lifespan. Longer tests will also allow researchers to see how the appearance and comfort of the bath linen remain over time. Guests may not notice a difference in the first few weeks, but after many washes, the differences will be more evident. More detailed findings about wear and tear levels can be collected after heavy use over a period of time. This will be able to be collected and used as a testament of the performance. Another aspect for future studies is to gather hard evidence on the costs and environmental impact of using

Eco-Bath Linen. This study relied mainly on staff observations, which could have been biased due to their ease of use. However, the study did not include concrete statistics from hotel accounts or laundry energy bills.

- Purchase costs over time
- Laundry water and electricity use
- actual replacement cycle times

Another way to go might be comparing Eco-Bath Linen with other sustainable textile products. If one product could be compared side-by-side with other products, hotels could make more informed choices, and manufacturers would be obliged to improve their design. Comparisons could look at factors like durability, comfort, price, disposal, and guest acceptance. In this respect, it would provide a stronger knowledge base for the hospitality industry. Finally, future research could look into whether Eco-Bath Linen is scalable for hotel chains. Testing just one hotel shows it to be feasible, but testing a hotel group or multi-national chain would give more evidence of how the product performs under different management systems and supply chain circumstances.

This sort of study would also reveal how much the product might affect. For instance, what would be saved in terms of water, energy, and costs if 100 hotels in a chain replaced their cotton bath linen with Eco-Bath Linen? Such research can show the real potential of the product at scale. In summary, future research should focus on six directions the study could take from here: more extensive sampling and longer trials, quantified data on cost and energy, cross-cultural comparisons, product benchmarking, and chain-level scalability. Each of these paths would deepen the findings in this paper. Eco-Bath Linen has strong potential, but more proof will further strengthen and convince hotel managers, investors, and sustainability experts. With further research, the product can go from being a promising innovation in one hotel to standing as a norm in the sustainable hotel business.

5.6 Summary of the Chapter

The vision of this research was to discover whether Eco-Bath Linen could be a more cost-effective and environmentally friendly alternative to traditional cotton bath linen in hotel operations. The overall objective was also threefold: to discover whether the product could, in fact, settle three hazards that have long confronted hotels, namely, a short life span of bath linen, high laundry costs, and an unsustainable method for disposing of used linen. The results of all six variables were positive and in line with the project staff's views. Also, after washing, they held their shape well. The resulting costs were also clear, such as fewer replacement orders and lower energy bills from faster drying times. Procurement processes became easier, with stock department money-saving supplies now serving a longer time, and life cycles were reduced. As regards sustainability, staff valued the eco disposal

system as it acted as an ongoing reminder to look after old bath linen in an environmentally responsible way.

They praised the bath linen for being soft, clean, and easy to use. Several individuals hinted they might in the future prefer Eco-Bath Linen to traditional cotton bath linen and accept this line by default when staying at a hotel. While appreciated, sustainability was less critical than comfort. Guests needed to trust that the eco-friendly alternative did not mean a nosedive in quality. Both hotel staff and guests reported an improvement in their experience. This balance of consistency in comfort levels while holding a tab on the expenses is most likely to create a feasible access to the hotel industry for Eco-Bath Linen. Future studies should therefore broaden their scale somewhat and examine whether these results hold true amongst differing hotels in different regions.

6 Reference

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Annex 2– Questionnaire for the Mapakada Village Staff

Questionnaire 1: Mapakada Village Staff Interview Form Eco Bath Linen Evaluation

User Demographic Information

Department –

Number of years working in the Hotel Industry -

Gender –

Declaration

I hereby confirm that I have read and understood that there will be no financial or non-financial benefits attached to pay participation in this survey/interview, and I have given unbiased and experience-based opinion to each and every question answered.

Section A

Durability Improvement with 300 washes

- Have you observed a change in quality after multiple washes of the Eco-Bath Linen?

(Yes / No)

Your Opinion:

- Have you experienced an increased lifetime of the test product to be precisely be able to maintain the quality up to 300 washes?

(Yes / No)

Your Opinion:

- Do you think the product's durability is noticeably longer than that of conventional bath linen?

(Yes / No)

Your Opinion:

Section B

Zero Piling and Consistency of Shape

- Have you noticed any piling on Eco-Bath Linen after repeated washes?

(Yes / No)

Your Opinion:

- Have you noticed the product being able to remain in its original shape during the target 300 washes?

(Yes / No)

Your Opinion:

- Do you think the test product is better than the conventional bath linen in terms of piling and consistency in shape?

(Yes / No)

Your Opinion:

Section C

Water Efficiency

- Have you experienced a reduction in water consumption to clean the bath linen compared to the conventional bath linen?

(Yes / No)

Your Opinion:

- Have you observed a noticeable reduction in water usage to wash the test bath linen compared to the usual bath linen?

(Yes / No)

Your Opinion:

- Have you noticed less time and resources taken to remove stains from the test bath linen compared to the conventional bath linen?

(Yes / No)

Your Opinion:

Section D

Drying Time and Energy Efficiency

- Does Eco-Bath Linen take less time to dry compared to conventional bath linen?

(Yes / No)

Your Opinion:

- Have you experienced a decrease in the usage of energy (washing time, drying time, including the natural methods, and use of machines) if the test product is drying fast?

(Yes / No)

Your Opinion:

Section E

Guest Feedback

- Have you received any positive feedback from the guests about their trial experience of the test bath linen?

(Yes / No)

Your Opinion:

- Have you heard of any guest complaints or rejection of the test products by the guests?

(Yes / No)

Your Opinion:

Section F

Economic Savings and Efficiency in Procurement

- Do you think the hotel will be able to reduce the number of re-orders of the bath linen?

(Yes / No)

Your Opinion:

- If yes, do you think the hotel will be able to save money over time through the lower number of re-orders and other efficiency improvements?

(Yes / No)

Your Opinion:

- Do you think the procurement and supply chain management process will be more efficient if the test product is used instead of the conventional bath linen?

(Yes / No)

Your Opinion:

Section G

Sustainable Disposal

- Are you aware of Eco-Bath Linen's return and recycling disposal policy?

(Yes / No)

Your Opinion:

- Do you believe this disposal and recycling approach will be more sustainable and better than the previous methods of disposal?

(Yes / No)

Your Opinion:

Section H

Comparison with Conventional Bath Linen

- In your view and experience, is Eco-Bath Linen good in quality compared to conventional bath linen?

(Yes / No)

Your Opinion:

- Do you find it easier to handle or manage the test product compared to the conventional bath linen?

(Yes / No)

Your Opinion:

Section I

Comfort and Acceptance

- Do you think the Eco-Bath Linen towels are more comfortable and acceptable for guests compared to the conventional bath linen?

(Yes / No)

Your Opinion:

- Would you prefer the continuation of the test bath linen at your workplace for the guests or the removal of the conventional bath linen?

(Yes / No)

Your Opinion:

Annex 3 - Questionnaire for the Guests**Questionnaire 1: Mapakada Village Guest Interview Form****Eco Bath Linen Evaluation****User Demographic Information**

Guest's Gender –

Number of days stayed at the Hotel -

Declaration

I hereby confirm that I have read and understood that there will be no financial or non-financial benefits attached to pay participation in this survey/interview, and I have given unbiased and experience-based opinion to each and every question answered.

Section A**Product Comfort and Usability**

- Was the bath line pack you used during your stay comfortable?

(Yes / No)

Your Opinion:

- Did you feel the towel soft and absorbent?

(Yes / No)

Your Opinion:

Section B

Perceived Sustainability

- Were you informed that the towel provided an eco-friendly disposal mechanism that reduces environmental damage?

(Yes / No)

Your Opinion:

- Do you think the recollection method of the used bath linen and environmentally friendly recycling approaches will improve the sustainability initiatives of the hotel?

(Yes / No)

Your Opinion:

- Do you think using such sustainable towels will make you contribute to the environment positively?

(Yes / No)

Your Opinion:

Section C

Overall Experience

- Would you be happy to use this Eco-Bath Linen towel again

(Yes / No)

Your Opinion:

- Would you like to support hotels adopting such sustainable and long-lasting products?

(Yes / No)

Your Opinion:


Annex 4 – Thematic Table

Thematic Table Analysis			
Key Theme	Keywords Identified	Representative Quotes (similar expression to the actual feedback)	Interpretation / Information
Durability Improved with 300 washes (Longevity and Strength after repeated washing)	Long-Lasting, Durable, Strong, Quality Retention, Extended life	Guest : The Towel still looked new after several days of use	Both groups confirm that the Eco-Bath linens remain durable and maintain high quality even after repeated washing. The increased lifespan supports the hotel sustainability and cost efficiency
		Staff : Still feels fresh and usable after many washing cycles	
Zero piling and consistency of the shape (Retentional of Fabric smoothness and consistency of the structure)	Smooth , No Piling, Retain the shape, Clean look, Stable edge, Consistance	Gust : The Towel looks neat and didn't loose its shape	The towels was able to maintain a neat apperance and texture after several washes imporving presentation standards and extended usable life of the unit
		Staff : Edges remain straight annd the fabric doesn't pile	
Price efficiency with usability upto 300 washes (Resource savings and lower maintenane)	Less detergents, Less water, Fast drying, Low energy use, cost saving	Guest : it dries quickly and feels light	Hotels benefit from reduced operational costs due to lower detergent, water and energy usage. Cost savings strengthen the financial feascibility of switching to Eco-Bath Linens
		Staff : we use less detergent and power. Saves money	

Thematic Table Analysis			
Key Theme	Keywords Identified	Representative Quotes (similar expression to the actual feedback)	Interpretation / Information
Sustainable Disposal (Environmental Awareness and Responsible Disposal methods)	Recycling, Eco-friendly, reuse, disposal policy, Waste reduction	Guest : I liked knowing the towel can be recycled	The awareness of eco-friendly disposal and recycling practices is high among both guests and staff. This aligns with the hotel's sustainability initiatives and enhances its green vision
		Staff : Would not be part of landfillings	
Customer comfort (Softness, absorbancy and positive guest experience)	Soft, comfortable, absorbent, smooth, quick-drying	Guest : it was very soft and comfortable to use	Comfort and user satisfaction are strong indicators of acceptance. Guests associate the eco-bath linen product with luxury, reinforcing with sustainability that dosen't compromise on comfort
		Staff : Guests had a pleasant feedback on how light and smooth it feels	
Sourcing and suply chain efficiency (Improved stock management and efficiency improvement in procurement)	Easy to manage, fewer reorders, efficient purchasing, long-lasting stock	Staff : stocks lasts longer so don't have to order often	Efficient supply chain management and extended product life reduces the need for frequent purchases imporving operational sustainability
		Guest : The hotel should cosider this durable product	

Summary			
Durability and Comfort are the key drivers that determines satisfaction			
Sustainability impact is considered as a added value			
Economic efficiency by reducing the amount of water, detergent and energy is considered a saving but at a nominal value which is not measurable unless			
Confirms that Eco-Bath Liens has been able to build an impression that the product is feascible, eco-conscious, meets customer expectations,			
This aligns the environmental demand of the macro environemnt and meets the cost savings objective of the internal environment			

Annex 5 – Consent Letter Issued by Mapakada Village



MAPAKADA VILLAGE - MAHIYANGANAYA

10.04.2025
 The Thesis Commissioner / Coordinator
 Haaga Helia University of Applied Sciences
 Pajuniityntie 11, 00320 Helsinki.

Dear Sir/Madam,

Authorization to Conduct Research on "Eco-Bath Linen" at Mapakada Village


I, Dinesh Eshwara, General Manager of Mapakada Village, Mahiyanganaya, am pleased to extend my consent and full support for Mr. Nanayakkara Kariyawasam Udara L Panditharathna to conduct his research study on an alternative bath linen solution named "Eco-Bath Linen" at our property. As part of this research, we agree to:

- Facilitate the placement of 10 "Eco-Bath Linen" bath towels in our washing room to undergo up to 300 wash cycles, alongside 10 regular bath linens for comparative analysis. These towels will be used strictly for wash-testing purposes.
- Provide 10 sets of "Eco-Bath Linen" (each set consisting of 2 face towels, 2 bath towels, and 1 bath mat) to selected guests/residents for trial, in order to evaluate the overall user experience.


We understand that Mr. Panditharathna aims to conduct a comprehensive study covering aspects such as comfort levels, durability, sustainability, price perceptions, and overall user preference. The feedback is expected to be gathered from at least 30 volunteers, including 15 staff members involved in fabric handling, room service, and guest interactions, as well as 15 guests and staff members providing user experiences or reporting guest feedback. This feedback will include insights on customer preference, comfort, usability after 150 washes, pile issues, and water/water usage compared to conventional bath linen. The responses are expected to be collected through individual interviews, facilitated online for the convenience of the participants. As a hotel, we recognize the significance of this research and the potential positive impact its findings may have on the hospitality industry as well as our own sustainability efforts. We are therefore committed to extending our fullest support by facilitating the sample testing and enabling the surveys among both our staff and guests. Participation of guests will be entirely voluntary, with no obligation to take part unless they are willing to do so.

On behalf of Mapakada Village, I wish Mr. Udara Panditharathna all the very best for the successful completion of this study. We look forward to contributing meaningfully to his research and to the broader vision of promoting sustainable practices in hospitality.

Yours sincerely,




.....
 Dinesh Eshwara
 General Manager
<https://www.mapakadavillage.lk/>




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Annex 6 – Thesis Commissioning Agreement

 Haaga-Helia		Thesis commissioning agreement Bachelor Degree		(1/2)
<p>The purpose of the thesis is to develop and demonstrate the student's ability to apply his/her knowledge and skills acquired in the student's studies. The scope of the thesis is 15 ECTS points (400 hours). With this agreement, the completion and supervision of the thesis and the research and development objectives of the thesis are agreed upon.</p>				
COMMISSIONING PARTY				
Commissioning party (company or other organisation)	Mapakada Village - Mahiyanganaya			
Job supervisor or contact person	Name	Dinesh Eshwara	Position	General Manager
Address	Mapakadawew, Badulla Road, Mahiyanganaya			
E-mail address	reservations@mapakadavillage.lk	Telephone	+94777926790	
STUDENT INFORMATION				
First and last name	N.K Udara L. Panditharathne	Student number (only in thesis advisor's copy)	230787	
Degree programme	Bachelor of Business Administration - Hospitality and Tourism Experience Management			
Campus	Haaga Helia – Haaga Campus			
Home address	Viljelijantie 4-6 A 005, 00410, Helsinki			
E-mail address	udara.panditharatne@gmail.com	Telephone	0442489184	
If the thesis is completed as teamwork (two or more persons), the names of the other participants: N/A				
THESIS OBJECTIVE AND ADVISING				
Thesis topic	Enhancing Hotel Cost Efficiency and Sustainability: Evaluating the Impact of Durable, Cost-Efficient, and Energy-Saving Bath Linen in Hotel Laundry Operations			
Research and development objectives (in an appendix if necessary)	<ul style="list-style-type: none"> • To evaluate hotel staff and guests' experiences regarding the comfort in the consumption of Eco-Bath Linen. • To determine whether the product's enhanced usable lifespan (up to 300 washes) improves economic value for hotels. • To discover if zero piling and constant form are practically achievable from the product and the functional lifetime. • To assess whether cost effectiveness and extended usability influence hotel linen purchase and budget management. • To investigate opinions of sustainable disposal methods and how they relate to the hotel's environmental initiatives. 			

	<ul style="list-style-type: none"> • To investigate the efficiency and environmental sustainability of the product's sourcing and supply-chain structure in achieving environmentally friendly requirements. • To identify whether the information gathered from the hotel's employees and customers is enough to warrant introducing Eco-Bath Linen to other kinds of hotels in Sri Lanka.
Haaga-Helia's thesis advisor(s)	Aarti Anna-Liisa
Thesis completion objective:	____ / ____ 20__

The commissioning party's representative(s) agree to support the thesis process.

In addition, (check boxes as applicable):

- the commissioning party shall financially compensate Haaga-Helia or the student (separate agreement).
- the commissioning party shall reimburse the student for costs arising from the commissioned thesis, e.g. material acquisition, travel expenses, raw material expenses (a separate clarification/agreement if necessary).

TERMS OF THE AGREEMENT
Thesis supervision and responsibilities

The student is responsible for the thesis, i.e. its completion, contents, and results. The responsibility of Haaga-Helia University of Applied Sciences is limited to thesis advising.

The commissioning party undertakes to provide the student with all of the needed information and resources agreed upon, and also to supervise the process from the perspective of the commissioning organisation. As part of thesis assessment, the commissioning party has the right to assess the usefulness of the results to its activities.

Data Protection

If personal data is processed in the thesis, the commissioning party is the data controller. As a data controller, the commissioning party commits to processing personal data in accordance with data protection legislation, such as the EU's General Data Protection Regulation and Finland's national data protection law, as well as the commissioning party's own data protection practices.

Rights to thesis results and other thesis materials, equipment and applications

The copyright to the thesis results belongs to the thesis author(s). If the author is employed by the commissioning party, copyright issues will be determined on the basis of the terms of employment in force.

The commissioning party has the right to use the anticipated thesis results. Should the thesis results exceed the standard, the commissioning party shall separately agree with the author on their commercial use.

The student has the obligation to provide the commissioning party with a report on the thesis results.

Publication of the thesis report

The thesis report is a public document that is published in the publication archive of universities of applied sciences. The assessment of the thesis report is also public, and is available from the Haaga-Helia University of Applied Sciences library or study office.

Confidentiality

If the commissioning party delivers information that it defines as a business secret or otherwise confidential, the commissioning party is obliged to clearly mark such documents and indicate which information cannot be included in the thesis report due to their confidentiality.

The student, the thesis advisor as well as the examiners undertake to keep secret all information and documents defined by the commissioning party as business secrets or otherwise confidential during the thesis process and in the negotiations before or after it, and not to exploit this information without separate permission.

Thesis costs and compensation

The commissioning party and the student shall separately agree on compensation for costs arising from the commissioned thesis, e.g. material acquisition expenses, raw material expenses, travel expenses, and work compensation. Haaga-Helia University of Applied Sciences shall provide sufficient staff resources for thesis advising.

Termination of the agreement

This agreement can be terminated if there is a strong reason to do so (e.g. the student terminates his/her employment relationship with the commissioning party).

WE HAVE JOINTLY AGREED ON THESIS COMPLETION AND ADVISING AS DESCRIBED ABOVE

Date	Signatures
09/10/2025	Commissioning party   MAPAKADA VILLAGE Tele: 0554936937, 0553558035 Web: www.mapakadavillage.com
09/10/2025	Student 
___ / ___ 20__	Haaga-Helia thesis advisor
Haaga-Helia University of Applied Sciences , tel. (09) 229 611, www.haaga-helia.fi , e-mail format firstname.lastname@haaga-helia.fi	

This agreement is made in three copies, one for the commissioning party, one for the student and one for the thesis advisor. Submitting a pdf copy of the signed agreement or signing the agreement electronically is equivalent to submitting the original signature.