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**DEVELOPMENT OF A STRATEGIC FRAMEWORK
EMPOWERING SRI LANKAN HOTELS TOWARDS NET ZERO
EMISSIONS THROUGH SUSTAINABLE RETROFITTING**

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Declaration of the Candidate and the Supervisor

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Abstract

This thesis explores sustainable retrofitting strategies for small to medium-sized resort-type hotels in Sri Lanka, aiming to achieve decarbonization goals and enhance sustainability. The primary objective is to develop practical guidelines that ensure operational efficiency, focusing on improving energy, water, and resource consumption performance. The research employs a mixed-methods approach, combining both qualitative and quantitative analyses to assess the baseline performance of resort-type hotels in Sri Lanka and identify effective retrofitting strategies. Key findings of the study indicate that over 80% of greenhouse gas (GHG) emissions in these hotels are attributable to energy consumption, underscoring the critical need for energy performance enhancement. Although water and waste contribute less to GHG emissions, their impact on operational costs is significant. Performance metrics such as energy consumption per occupied room, water usage, waste generation, and GHG emissions per occupied room were utilized to evaluate hotel performance. Improving these metrics is essential for cost reduction and minimizing GHG emissions, thereby boosting the overall sustainability profile and attracting eco-conscious guests. The research also identified decision-making challenges faced by hotel stakeholders when implementing new strategies. Using the Analytical Hierarchy Process (AHP), the study pinpointed key decision criteria: annual emissions saving, adaptability, initial investment, payback period, maintenance requirements, and technical complexity. A total of 30 feasible and effective retrofitting techniques were assessed, providing a comprehensive set of options for hotel operators. The implications of this research are significant for the hospitality industry, particularly for resource-limited small to medium-sized hotels. The developed guidelines and framework enable these hotels to systematically evaluate their emissions using a GHG Emissions Calculator and make informed decisions on retrofitting strategies. The framework's inclusion of local benchmarks, based on sample analysis, resolves the challenge of informed decision-making for sustainable retrofits. However, this study focuses exclusively on small to medium-sized hotels in Sri Lanka, potentially limiting the generalizability of the results. The research timeframe also restricted the exploration of long-term impacts of sustainable retrofits.

Future research should address these limitations by expanding the scope to include larger hotels, diverse geographic regions, and a broader range of retrofitting strategies, including those involving the latest technologies. Additionally, understanding the behavioral changes of guests and staff regarding sustainable practices will further inform effective decision-making. In conclusion, this thesis provides a robust framework and practical guidelines for sustainable retrofitting in small to medium-sized resort-type hotels, highlighting the potential for significant environmental and economic benefits. By adopting these strategies, hotels can enhance their sustainability profile, reduce operational costs, and contribute to global decarbonization efforts.

Key Words: Sustainable Retrofitting, Decision Support, Sri Lankan Hotels, Operational Optimization, Analytical Hierarchy Process (AHP), Strategic Framework

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