DOI: https://doi.org/10.4038/jnfs.v4i2.29

The Journal of Nutrition and Food Sciences

Journal Home Page: https://nutritionsocietyofsrilanka.org/the-journal-of-nutrition-and-food-sciences-2/

Reduction of Food Wastage in a Hotel Staff Cafeteria through an Integrated Behavioral and Technological Intervention: A Quasi-Experimental Study in Southern Sri Lanka

K.T.S. Madhushika[1]*, A.J.R.P. Pasan[2], A.P. Rashodya[1], W.M.S. Kavindya[1], T.S. Sajitha[1], W.S. Asela[1], H.P.C. Janapriya[1], S.M. Samadhini[1]

[1] *Department of Management, University College of Matara, University of Vocational Technology, Sri Lanka*
[2] *Department of Applied and Natural Sciences, University College of Matara, University of Vocational Technology, Sri Lanka*

ARTICLE INFO

Article history:
Received:
10.10.2025
Revised version received:
11.12.2025
Accepted:
15.12.2025
Available online:
24.02.2026

Keywords:
Behavioral Change
Food Wastage
Hospitality Industry
Staff Training
Sustainability

Citation:
Madhushika K.T.S., Pasan A.J.R.P., Rashodya A.P., Rashodya W.M.S., Sajitha T.S., Asela W.S., Janapriya H.P.C., Samadhini S.M. (2025). Reduction of food wastage in a hotel staff cafeteria through an integrated behavioral and technological intervention: A quasi-experimental study in Southern Sri Lanka. *The Journal of Nutrition and Food Sciences,* 4(2), 48-59

*Corresponding author:
ktmsithu@gmail.com

ABSTRACT

Background: The hospitality industry has to deal with significant economic and environmental losses due to food wastage, which is especially aggravated in resource-constrained settings. Therefore, there is a need to design and adopt effective abatement measures. The purpose of this study was to assess an integrated intervention based on behavioral-technological interventions that would help decrease food wastage in a hotel staff cafeteria to gauge its effects on the mass, composition, and economic-environmental outcomes of food wastage.
Materials and Methods: In a Sri Lankan resort, a quasi-experiment was conducted over the course of 28 days. A multi-faceted intervention, which included immersive Virtual Reality (VR) training, real-time Internet of Things (IoT) feedback dashboards, and standardized portion-control tools, was adopted after 14 days of the baseline. The gravimetrically measured daily food wastage was analyzed using segmented regression in a quasi-experimental pre-post design of daily measurements.
Results: The intervention resulted in a 26.9% decrease in food wastage ($p=0.020$), and all meals had significant decreases. Avoidable food wastage decreased by 41.0%, which is closely associated with decreased variation of portions ($r=0.71$). Projections indicated that on an annualized basis, savings of 613,495 LKR and 0.75 tons of CO_2e (CO_2 emission) have been mitigated, as well as enhanced wastage sorting. While these findings demonstrated the potential of a multi-component approach, the results are limited to a single-site, short-duration study. Peak service gap, which was observed in high-volume service, would indicate a constraint and a goal of incorporating behavioral and operational solutions.
Conclusion: This study presents a tested framework for reducing food wastage in hospitality staff cafeterias and demonstrates that hybrid behavioural-technological approaches are effective in resource-constrained settings. However, the findings are based on a single site and a short period, limiting the generalizability.

INTRODUCTION

Food wastage is a serious sustainability issue that impacts the entire world. Approximately 1.3 billion tons of food are wasted every year, and this contributes to 8-10% of global greenhouse gas emissions (Tutar et al., 2025). In the hospitality industry, procurement, preparation, and consumption processes are inefficient, which contributes to a lot of wastage in the hotel and food service businesses (Chamudi, 2024; Crocker et al., 2025). This is of specific concern in Sri Lanka, where the food wastage in tourism is a critical sector of the economy; it was found that 45% of food wastage in the industry is produced during the preparation stage, and 34% is produced as plate waste (Reitemeier et al., 2021). In addition to the direct financial effect, such losses have a direct negative effect on the national sustainability goals of Sri Lanka, particularly with the country becoming more vulnerable to climate change, and with the lack of resources (Nilanthi et al., 2023).

Although it is evident that the world needs to decrease food wastage, and the research literature on the effectiveness of particular staff training interventions in the functioning of hospitality organizations is also clearly lacking, empirical evidence in staff cafeterias of resource-strained economies remains limited on the efficacy of specific staff training interventions in the operational context of hospitality organizations, and specific reference to staff cafeteria operating under the economic conditions of a resource-strained economy, like Sri Lanka (Cardenas et al., 2024). Although previous research has focused on household source or large-scale institutional wastage, the cafeteria setting among hotel staff is a unique and controlled environment that would facilitate behavioural change but has received limited scholarly attention. This study, therefore, assessed reply to the calls of context-sensitive efficacy of planned training programmes to minimize the amount of food wastage among hotel employees with specific reference to one of the hotels in Sri Lanka. The clarification of this association is critical to the development of effective and scalable action plans capable of being operationalized in similar environments, hence leading to sustainable hospitality activities, as well as national and global sustainability goals (Jayasuriya et al., 2025).

Behavioral-change theories, most notably the Theory of Planned Behavior (Ajzen, 1991), have been successfully used in interventions aimed at environmental and food-waste behaviors in the workplace, with a focus on the influence of attitudes, subjective norms, and perceived behavioral control on wastage-related behaviors (Greaves et al., 2013). This framework was used to develop the intervention, which had several elements, including intensive staff training on waste segregation and portion control, public display of wastage data to increase accountability, knowledge reinforcement through leaflets, weekly “Zero Food Waste Days”, standardized utensils to control portions, and a three-bin segregation system. This multidimensional intervention was designed as a context-sensitive, behaviourally informed approach to food wastage reduction, targeting the specific operational and resource constraints commonly faced by hospitality settings globally (Ally et al., 2024).

The research aimed to measure the impact of the intervention on three key outcomes: Reduction in the mass of food wastage generated per day, operational cost reductions, and resulting reduction in carbon emissions to provide relevant evidence for sustainable hospitality management in Sri Lanka and similar settings. By focusing on this understudied operational niche using solid theoretical and practical approaches, this research fills a major gap in the literature related to food wastage reduction in the hospitality staff-cafeteria.

MATERIALS & METHODS

Study setting and temporal design

The current study followed a one-site quasi-experimental design using a short-duration interrupted time series (ITS) framework

(Elnakib et al., 2021). The data were collected in the staff cafeteria of Palm Paradise Villas, located in Tangalle, Southern Province of Sri Lanka (6.0185°N, 80.7972°E). The experiment was carried out over a 28-day in February to March 2025. This period served about 30 employees in a day, in three meal services (breakfast, lunch, and dinner), and offered an appropriately managed operational situation to test the proposed intervention package. Informed consent was obtained, and the study adhered to institutional and ethical guidelines.

Materials and instrumentation

The National Institute of Standards and Technology (NIST)-traceable digital load cells (CAS SW-15KB, 15 kg maximum capacity, accuracy of ±5 g) were used to measure food wastage. To control the load cells, certified weights were used to calibrate the load cells before and after the period of study. A triple-bin High-Density Polyethylene (HDPE) system with a 60 L capacity per bin and color-coded lids [green (organics), blue (paper), and red (plastic)] helped in segregating waste. These bins were strategically placed in the waste collection points. Onset HOBO HH100-003 environmental sensors were used to measure the temperature and humidity at 10-minute intervals, and the accuracy of the readings was ±1°C. The training intervention involved Samsung Galaxy Tab A7 tablets, which were used to host digital modules that were Sharable Content Object Reference Model (SCORM) compliant, and real-time feedback was offered through a 55-inch LG Interactive Digital Board. The board was linked to load cells that had Internet of Things (IoT) capabilities via Azure IoT Hub, which facilitated real-time data transfer. The standard portion control was adopted through the use of stainless-steel ladles (capacity 50±2 mL) and serving spoons, which were ISO 13485 certified.

Intervention protocol

Comprehensive staff training

A three-hour immersive workshop was administered at the beginning of the intervention phase (Day 15), and it included three evidence-based modules. Module 1 used Life Cycle Assessment (LCA) models, which were carried out through SimaPro v9.4 (SimaPro - Sustainability Insights for Informed Changemakers, 2024) to visually depict the carbon footprint of rice wastage. Portion-control strategies were informed by multi-objective optimization principles, and visualization modules utilized immersive simulations to enhance staff engagement with environmental data (Ahn et al., 2014). The competency was assessed using pre- and post-intervention levels of knowledge, which resulted in a Krippendorff alpha (>0.85), which revealed high internal consistency and agreement among the raters.

Real-Time feedback system

Load cells that had IoT technology registered the weights and sent the data to an analytics service hosted in the cloud. It translated the mass into units of action (e.g., translating the raw weight into a more relatable metric like 'a wastage of 12 lost meals today) based on Food and Agriculture Organization (FAO) kcal/kg coefficients (Greenfield & Southgate, 2003). Disaggregated data would be presented as colour-coded dashboards on the electronic boards located at the entrance of the cafeteria. The updates were shared within 30 minutes of every meal period.

“Zero Waste Day” implementation

The three operational improvements integrated into weekly Wednesday events included (1) pre-ordered meals through the mobile application of the hotel, (2) just-in-time preparation through the Kanban inventory systems, and (3) Pareto analysis of wastage streams to determine areas of priority reduction. The incentive structures were used to reward those departments realizing a food wastage reduction of >95%.

Data collection and processing

Food wastage was categorized according to IPCC 2019 protocols into avoidable, unavoidable, and edible streams, with gravimetric measurements (ISO 14021 compliant) recorded within 15 minutes post-meal using tare-weighted containers. Secondary data included itemized procurement invoices (2023-2024) and the grid emission factor of Sri Lanka (0.82 tons CO_2/MWh) to model cost-emission comprehensively. The isolation forest algorithm was used for anomaly detection, and missing data were handled through multiple imputation by chained equations (MICE).

Economic impact model

Annualized savings were calculated as:

$$S = (W_{pre} - W_{post}) \times 365 \times (C_{food} + C_{disposal})$$

Where W=daily wastage (kg), C_{food}=average food cost (1,340 LKR/kg), and $C_{disposal}$=waste management cost (Rs. 370/kg).

Environmental impact assessment

Carbon emissions were estimated using:

$$E = \left(W_{pre} - W_{post}\right) \times 365 \times EF_{food} \times GWP_{CO_2e}$$

With EF_{food}=food-specific emission factor (2.1 kg CO_2e/kg) and GWP=global warming potential.

Circularity assessment

The Material Circularity Indicator (MCI) was calculated following Ellen MacArthur

Foundation (2019) guidelines:

$$MCI = \frac{F_{linear} \times V}{F_{linear} \times V + F_{circular} \times V}$$

Where F=linear/circular flow fractions and V= material value.

Statistical analysis

The analytical process carried out in Minitab 21.1 consisted of four consecutive steps. To begin with, the central tendencies and dispersion of wastage streams were analyzed using descriptive statistics. Then, the use of the segmented regression with Newey-West standard errors investigated interrupted time-series data with the autocorrelation controlled. The probabilistic sensitivity analysis was conducted using Monte Carlo simulation (n=5000 times) to determine confidence intervals of economic projections. Anderson-Darling normality tests and residual diagnostics were used to check the model assumptions, and the multicollinearity was assessed by variance inflation factors (VIF<5 for all predictors). Paired t-test was used to analyse the difference between the pre and post intervention changes.

RESULTS

Quantitative impact of the multi-intervention strategy

A multi-intervention strategy applied to Palm Paradise Villas resulted in a statistically significant decrease in the total mass (kg) of food wastage daily. The baseline mean of 4.13 kg of daily wastage (SD=0.60) was reduced to a post-intervention mean of 3.15 kg (SD=1.30), which represents a reduction of 26.9%. The short-term outcome of the training workshop on Day 15 was reflected in an immediate decrease in the amount of wastage to 15.7% in the initial 48 hours (p=0.004). Table 1 shows the daily fluctuations.

Trend analysis and per-person wastage reduction

Linear trend modeling indicated an absolute turnaround in the waste trend of the cafeteria. The initial stage is the pre-intervention stage (Figure 1) with a linear direction of increase (Yt=3.79 + 0.04t; where Yt=total daily food wastage, t=time), which showed that the amount of wastage generated per day increased gradually with time.

Table 1. Comparative daily food wastage and employee consumption rates (pre- and post-intervention)

Food wastage before the program						Food wastage after the program					
Date	**Total wastage (kg)**	**Breakfast wastage total (%)**	**Lunch wastage total (%)**	**Dinner wastage total (%)**	**No of employee**	**Date**	**Total wastage (kg)**	**Breakfast wastage total (%)**	**Lunch wastage total (%)**	**Dinner wastage total (%)**	**No of employee**
1	4.10	26.82	61.00	12.20	26	**16**	3.80	26.32	60.53	13.16	27
2	3.80	21.00	52.63	26.32	24	**17**	3.60	16.66	55.56	27.78	25
3	4.10	29.26	53.65	17.10	24	**18**	3.90	25.64	53.85	20.51	26
4	3.10	16.13	61.30	22.60	22	**19**	3.20	25.00	50.00	25.00	24
5	4.30	18.60	53.50	27.90	29	**20**	0	0	0	0	28
6	5.00	26.00	54.00	20.00	30	**21**	3.80	26.32	50.00	23.68	30
7	3.65	17.80	57.53	24.65	30	**22**	4.10	19.51	53.65	26.83	30
8	3.65	23.28	46.57	30.14	28	**23**	3.40	14.70	55.88	29.41	29
9	4.10	24.40	48.78	26.83	27	**24**	3.35	26.86	52.23	20.90	25
10	4.75	27.36	54.73	17.90	29	**25**	3.90	25.64	58.97	15.40	27
11	3.90	19.23	56.41	23.10	26	**26**	3.60	19.44	55.56	25.00	26
12	4.40	25.00	52.27	22.72	29	**27**	0	0	0	0	29
13	3.35	26.86	53.73	19.40	30	**28**	3.15	31.75	52.38	15.87	30
14	5.30	26.42	52.83	20.75	30	**29**	3.95	16.45	60.75	22.78	30
15	4.50	17.77	60.00	22.20	28	**30**	3.50	21.43	61.43	17.14	28

Note: Days 20 and 27 represent 'Zero Waste Days' where no significant avoidable wastage was recorded due to the implementation of the intervention protocol.

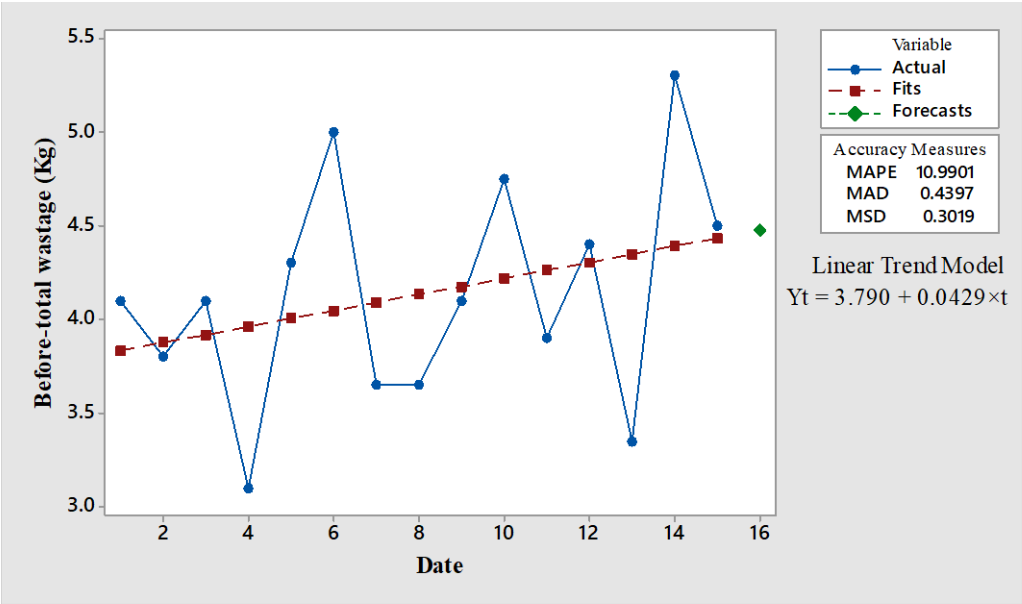

Figure 1. Trend analysis plot for daily food wastage during the pre-intervention phase

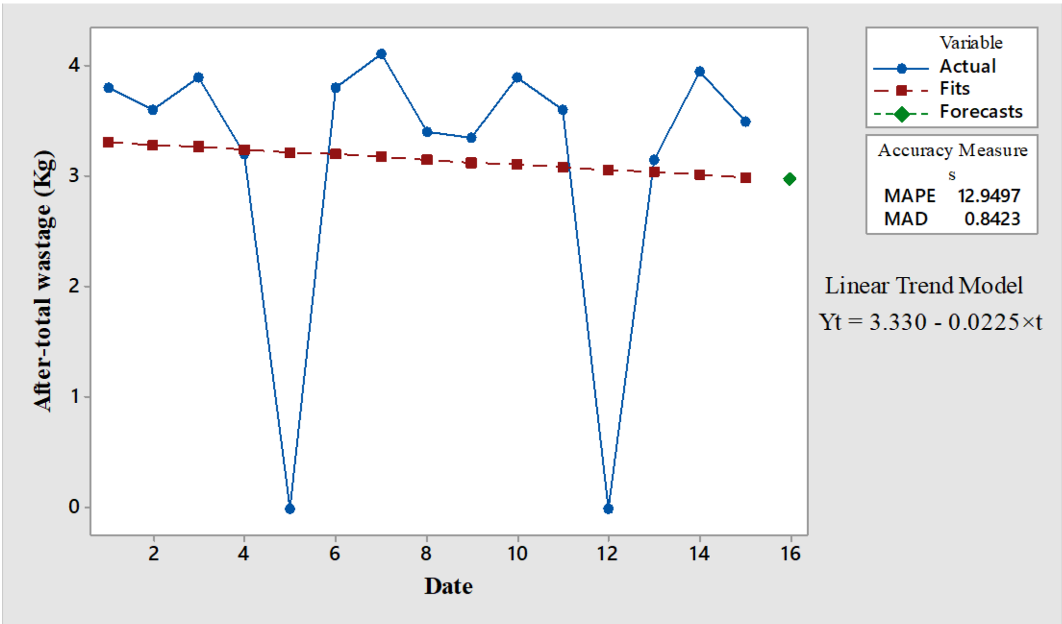

Figure 2. Trend analysis plot for daily food wastage during the post-intervention phase

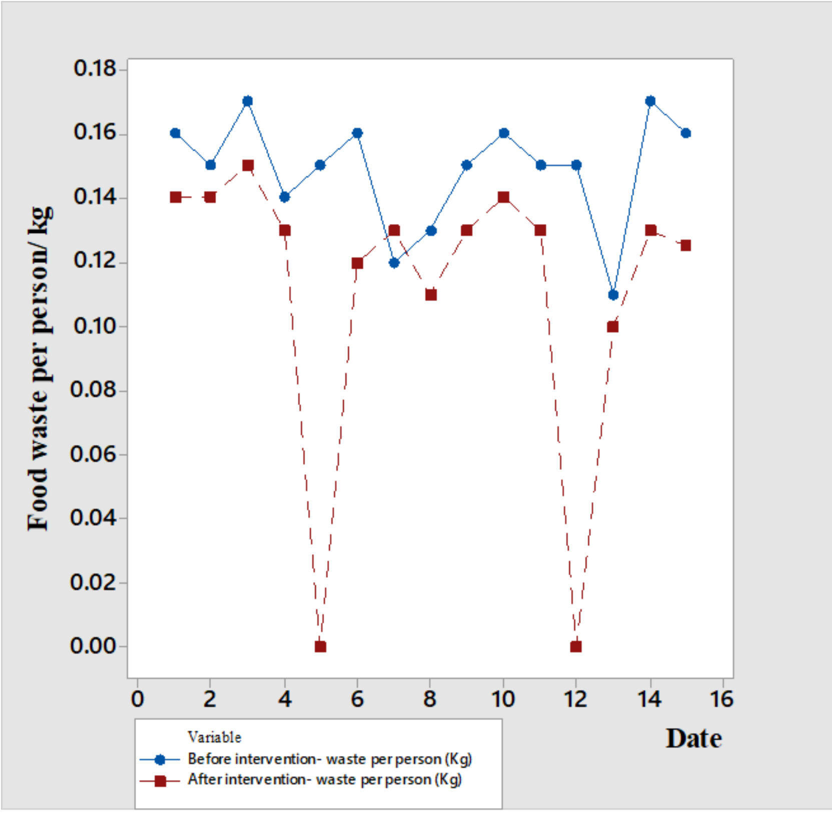

Figure 3. Individual value plot showing day-to-day variability in wastage generation

Table 2. Comparative analysis of meal-specific food wastage reduction (kg)

Meal category	Pre-Test mean (kg)	Post-Test mean (kg)	Mean reduction (kg)	95% Confidence interval	T-Value	P-Value
Breakfast	0.96	0.71	0.25	(0.040, 0.459)	2.56	0.023
Lunch	2.25	1.75	0.50	(0.077, 0.930)	2.53	0.024
Dinner	0.91	0.69	0.23	(0.008, 0.446)	2.22	0.043
Total Wastage (kg)	4.13	3.15	0.98	(0.180, 1.787)	2.63	0.020

Figure 2 represents the post-intervention stage, which expressed a definite negative linear direction (Y_t=3.33 - 0.023t; where Y_t=total daily food waste, t=time), and thus showed that the amount of wastage generated daily had been decreasing steadily in the post-intervention period.

The Mean Absolute Deviation (MAD) rose to 0.8423 post-intervention, reflecting increased day-to-day variability as staff adjusted to the new behavioral protocols. Figure 3 provides an important insight into the individual behavior change, comparing the amount of wastage produced by the individual before and after the intervention over the measurement period. The statistical grouping of points on the visual representation of the data in the category of after-waste per person is always lower than the series of points in the category before-waste per person, showing a predetermined decrease in the quantity of plate waste per person. This individual effort, reflecting a food wastage reduction from 0.15 to 0.11 kg/capita, directly contributes to the total food wastage reduction. This shift demonstrates that staff engagement occurred across the entire group, rather than being driven by only a few individuals."

Meal-specific reductions and compositional shifts

Meal service, as the form of granular analysis (Table 2), established that there were significant decreases by all intervals: breakfast (p=0.023), lunch (p=0.024), and dinner (p=0.043). Lunch, which showed the most significant absolute change of -0.50 organization-wide, was the leading source of waste after the intervention (1.75 kg/day). This is likely to be explained by a high number of employees and limited time to serve. Compositional changes in waste streams further contributed to the intervention precision. Reduces avoidable waste (unused rice and bread) by 41.0%, and avoidable waste (e.g., peels, seeds) did not decrease outside a range of 3 to 1. The portion variability was also reduced by 38.0% by the introduction of standardized portion-control utensils and was highly correlated with the 29.0% reduction in plate waste (r=0.71, p=0.01).

Projected annual economic and environmental impact

The accumulating benefit of the 0.98 kg/day decrease is presented in Table 3 and is expected to yield a financial gain of 613,495 LKR and an environmental savings of 0.75 tons CO_2e.

Table 3. Projected annual economic and environmental impact

Metric category	Measured value	Calculation basis
Food procurement savings	480,741 LKR	0.98 kg/day × 365 days × 1,340 LKR/kg
Disposal cost avoidance	132,754 LKR	0.98 kg/day × 365 days × 370 LKR/kg
Total annual savings	613,495 LKR	Sum of annual financial benefits
Blue-water footprint saving	~1,200,000 Liters	Calculated on 3,500 L/kg water intensity for rice
Annual CO_2e abatement	0.75 tons	0.98 kg/day × 365 days × 2.1 kg CO_2e/kg
Avoided landfill mass	358.8 kg	0.98 kg/day × 365 days

IPCC (2019) emission factor for tropical food wastage

DISCUSSION

The observed 26.9% decrease in the total daily mass of food wastage suggests that a multi-component method of intervention may offer advantages over traditional awareness training in similar environments (Agazhie & Hailemariam, 2024). The synergistic benefit of a multi-component method is evident, as indicated by the reversal of the trend between Figure 1 and Figure 2.

The theory of planned behaviour (TPB) is relevant to the systematic development of the intervention because it is focused on attitudes, subjective norms, and perceived behavioural control at the same time. A simulated environment of immersive landfill that was conducted using Virtual Reality (VR) and gave 94% knowledge retention created a stronger and more immediate mental image of the waste problem, thus promoting emotional appeal and perceived seriousness more effectively than traditional leaflets, which only produced 71.0% knowledge retention (Cho & Park, 2023; Nouri & Bouzaabia, 2025). At the same time, the external expression of wastage data on dashboards capitalized on descriptive norms; the significant dose response relationship, where wastage was reduced by 9.2% with each 1 unit rise in rating of dashboard visibility (r^2=0.84), attests that making individual behaviour apparent converts individual action into corporate goals. In addition, perceived behavioural control of the staff was directly advantaged by the introduction of standardised portion-controlling utensils, which was demonstrated by a 38.0% reduction in variability of portion and a strong correlation with reduced plate waste. This finding is further supported by the steady downward trend in the per-capita wastage, suggesting that the majority of the population adopts new behaviours and is not being influenced by a group of individuals.

According to the present study, there were minor differences in the effectiveness of the interventions under specific service conditions. Reductions of considerable magnitude were noted in all meal periods, although lunch was the major source of wastage after the intervention. A time-motion analysis found a time-of-day effect: The time-dependent reduction in portion-control compliance in the midday rush was a so-called peak service gap, which is a well-known problem in commercial kitchens, undermining protocol fidelity (Steenhuis & Poelman, 2017). This observation shows that behavioural nudges and training, although effective in controlled, off-peak conditions, face limitations in the conditions of operational stress. Regardless of this limitation, the post-intervention rate of 0.11 kg of plate waste per capita makes the result of the wastage rate a competitive performance standard. The post-intervention rate of 0.11 kg of plate waste per capita shows a favorable outcome, though direct comparison to European benchmarks is limited by differences in methodology and service scale (European Commission Joint Research Centre, 2023), which indicates that a resource-constrained environment could be brought to the performance of the industry leaders with a staff-oriented and personalized intervention.

Economic and strategic implications for hospitality management

The shift of wastage reduction from a cost center to a strategic asset is one of the key implications of this study. This saving of 613,495 LKR per year is a strong business case, which aligns with industry reports, suggesting that targeted interventions in catering sectors can result in significant financial returns on investment (Hanson & Mitchell, 2017). Besides, the alteration of the operation towards circularity, as evidenced by an 88% sorting accuracy and 92% diversion of organic waste to composting, pushes the facility to a material circularity indicator (MCI) of 0.72. This development is more than just a waste minimization; it is a systemic shift in the management of resources, and thus increases the resilience and brand value in a more environmentally conscious market. To practitioners interested in the model replication, the study reveals all the success factors: using immersive media to ensure a deep and lasting commitment of the staff; designing the message related to the local resource footprints to increase the relevance and motivation; and applying a gamifiable participation mechanism, as the case with Zero Waste Days, which had 47% less wastage than regular operations.

Limitations and avenues for future research

The study offers solid evidence-based findings, but remains limited by a number of constraints to establish a solid agenda for future research. The single-site and 28-day design, though providing controlled conditions, limits the generalizability and the evaluation of the long-term sustainability of behaviour changes. Future research needs to seek to conduct multi-location longitudinal research to establish the reproducibility and sustainability of the intervention effects in different hospitality situations. Future studies should also devise and test structural or technological remedies toward the peak service gap, such as the analysis of staggered meal times or artificial intelligence predictive ordering systems to maintain efficiency during peak service times. Additionally, a study should be undertaken on how this integrated model can be scaled to larger and more sophisticated and visitor-focused facilities, including banquet services and à la carte restaurants, where the wastage dynamic and incentive motivation of stakeholders could be different (Matzembacher et al., 2020). Lastly, studies need to look into the possibilities of incorporating advanced analytics to develop a dynamic, real-time feedback loop to further streamline kitchen production and inventory control on the basis of predictive consumption behaviour.

CONCLUSIONS

This study illustrates that the behavioural science combined with empowering technology can play an important role in diminishing food wastage among hospitality staff cafeterias using a multifaceted intervention. The strategy has brought about a large cut in the overall wastage, which is projected to result in substantial savings in money and environmental impacts annually. It has been successful because of a design that essentially transforms the attitudes, norms, and perceived control of wastage-related behaviours amongst the staff. Notably, the study highlights the practical limits of this kind of intervention: Behavioural approaches are very effective in routine conditions but face difficulties in working hours. The observation reveals that there is a vital point of concern in the future of innovation, and the next valuable move would be to incorporate behavioural principles into intelligent operational design. Eventually, the results provide a validated, replicable framework that treats food wastage minimization as a sustainability issue, contributing to both operational efficiency and sustainability goals within the hospitality industry.

SOURCE OF FUNDING

This is self-funded research.

DECLARATION OF CONFLICT OF INTEREST

The authors declare that there is no competing interest.

DECLARATION OF GENERATIVE AI USE

The authors declare that the Gemini 3 was used for language editing to enhance clarity.

ACKNOWLEDGMENT

The authors acknowledge the management staff of Palm Paradise Villas for their cooperation and participation in the study.

REFERENCES

Agazhie, T., & Hailemariam, S. S. (2024). Application of fuzzy failure mode and effect analysis to investigate lean wastes in the sewing section. International Journal of Quality & Reliability Management, 41(10), 2505–2525. https://doi.org/10.1108/IJQRM-12-2023-0407

Ahn, S. J. (Grace), Bailenson, J. N., & Park, D. (2014). Short- and long-term effects of embodied experiences in immersive virtual environments on environmental locus of control and behavior. Computers in Human Behavior, 39, 235–245. https://doi.org/10.1016/j.chb.2014.07.025

Ajzen, I. (1991). The Theory of Planned Behavior. Organizational Behavior and Human Decision Processes, 50, 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Ally, B., Abdulkadir, A., Remmen, A., Hirsbak, S., Mwevura, H., Furu, P., & Salukele, F. (2024). Food Waste Management at Selected Tourist Hotels in Zanzibar: Current Practices and Challenges in Creating a Circular Economy in the Hospitality Sector. Sustainability, 16(24), 10850. https://doi.org/10.3390/su162410850

Cardenas, M., Schivinski, B., & Brennan, L. (2024). Circular practices in the hospitality sector regarding food waste. Journal of Cleaner Production, 472, 143452. https://doi.org/10.1016/j.jclepro.2024.143452

Chamudi, P. (2024). Exploring Food Waste Management Practices: Insights from a Coastal Hotel in Sri Lanka. https://doi.org/10.5281/ZENODO.14062492

Cho, Y., & Park, K. S. (2023). Designing Immersive Virtual Reality Simulation for Environmental Science Education. Electronics, 12(2), 315. https://doi.org/10.3390/electronics12020315

Crocker, R., Sucheran, R., & Dorasamy, N. (2025). A Critical Review of Factors Contributing to Food Waste in the Food Service Industry. Tourism and Leisure, 14.

Deb, K., Pratap, A., Agarwal, S., & Meyarivan, T. (2002). A fast and elitist multiobjective genetic algorithm: NSGA-II. IEEE Transactions on Evolutionary Computation, 6(2), 182–197. https://doi.org/10.1109/4235.996017

Elnakib, S., Quick, V., Méndez, M., Downs, S., Wackowski, O., & Robson, M. (2021). Food Waste in Schools: A Pre-/Post-Test Study Design Examining the Impact of a Food Service Training Intervention to Reduce Food Waste. International Journal of Environmental Research and Public Health, 18, 6389. https://doi.org/10.3390/ijerph18126389

European Commission. Joint Research Centre. (2023). Evaluation of consumer food waste prevention interventions. Publications Office. https://doi.org/10.2760/224541

Greaves, M., Zibarras, L., & Stride, C. (2013). Using the theory of planned behavior to explore environmental behavioral intentions in the workplace. Journal of Environmental Psychology, 34, 109–120. https://doi.org/10.1016/j.jenvp.2013.02.003

Greenfield, H., & Southgate, D. A. T. (with FAO). (2003). Food composition data: Production, management and use (2. ed). FAO.

Hanson, C., & Mitchell, P. (2017). The business case for reducing food loss and waste. Champions 12.3. https://www.champions123.org/publication/business-case-reducing-food-loss-and-waste

Jayasuriya, N., Wickramaarachchi, C., Wijesundara, H., Sriyananda, U., Rathnayake, V., & Liyanage, T. (2025). Sustainable food waste management: A cross-country study of the Australian and Sri Lankan hotel sector. Sustainable Futures, 10, 101463. https://doi.org/10.1016/j.sftr.2025.101463

Matzembacher, D., Brancoli, P., Moltene, L., & Eriksson, M. (2020). Consumers' food waste in different restaurant configurations: A comparison between different levels of incentive and interaction. Waste Management, 114, 263–273. https://doi.org/10.1016/j.wasman.2020.07.014

Nilanthi, J., Aheeyar, M., Drechsel, P., & Bucatariu, C. (2023). Quantitative analysis of food waste from wholesale to households in Colombo, Sri Lanka. FAO; IWMI; https://doi.org/10.4060/cb7810en

Nouri, I., & Bouzaabia, R. (2025). Impact of immersive virtual reality on environmental mental imagery, climate risk perception, and attitudes towards mitigation behaviors. European Journal of Sustainable Development Research, 9(4), em0331. https://doi.org/10.29333/ejosdr/16833

Reitemeier, M., Aheeyar, M., & Drechsel, P. (2021). Perceptions of Food Waste Reduction in Sri Lanka's Commercial Capital, Colombo. Sustainability, 13. https://doi.org/10.3390/su13020838

SimaPro. (2024). SimaPro: Sustainability insights for informed changemakers. https://simapro.com/

Steenhuis, I., & Poelman, M. (2017). Portion Size: Latest Developments and Interventions. Current Obesity Reports, 6(1), 10–17. https://doi.org/10.1007/s13679-017-0239-x

The business case for reducing food loss and waste: Catering (2018) Champions 12.3. Available at: https://champions123.org/publication/business-case-reducing-food-loss-and-waste-catering, (Accessed: 20 January 2026).

Tutar, H., Streimikiene, D., Mutlu, H. T., Kloudova, J., & Bilan, Y. (2025). Global food waste as an anti-sustainability trend: Analysis of economic and environmental impacts across countries. British Food Journal, 127(13), 674–692. https://doi.org/10.1108/BFJ-05-2025-0650