Exploring Sustainable Waste Management Practices in the Food Service Sector in the Sunyani Municipality: A Restaurant-Based Study

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ABSTRACT

Purpose: This study aims to assess waste management practices in the food service industry within the Sunyani Municipality. It examines the strategic action plans, the effectiveness of environmental management policies, and the role of economic incentives in promoting sustainable waste management practices.

Design/Methodology/Approach: A descriptive cross-sectional research design was employed, involving 331 respondents from 110 restaurants. Data was collected through structured questionnaires focusing on waste management strategies, environmental policy effectiveness, and economic incentives. Statistical analyses, including descriptive and inferential methods, were used to evaluate the data.

Findings: The results reveal significant positive impacts of strategic waste management initiatives such as adherence monitoring, education and training, and reuse and recycling enhancement. Economic incentives, including deposit-refund systems and circular economy models, were identified as effective motivators for sustainable waste practices. However, gaps remain in policy enforcement and community awareness.

Research Limitation/Implication: The study is limited to restaurants in Sunyani Municipality and relies on self-reported data, which may introduce biases. Future research should explore broader geographic areas and incorporate longitudinal data.

Practical Implications: The findings provide actionable insights for restaurant managers to adopt effective waste management strategies and leverage economic incentives. Policymakers can utilize the results to enhance regulatory frameworks and support mechanisms.

Social Implications: Improved waste management practices contribute to environmental sustainability and public health. Educating communities on waste reduction, reuse, and recycling fosters a culture of sustainability and reduces environmental degradation.

Originality/Value: This research highlights the integration of strategic waste management practices and economic incentives in the context of a growing urban municipality. It offers a unique contribution by addressing the interplay between policy effectiveness, economic incentives, and sustainable practices in the food service industry.

Keywords: Sustainable waste management, food service industry, environmental policies, circular economy, economic incentives, Sunyani Municipality

INTRODUCTION

Municipal solid waste in food service industry is composed of remnants of food, packaging and disposable items that if not well disposed has the tendency to cause environmental pollution and economical impediments.

Increased human population and urbanization lead to increased generation of solid waste; restaurant waste is a key participant in congestion of the landfills and pollution of the environment (Waste Resources Institute, 2020). Learning from literature, it could be observed that the food service sector needs to seriously consider waste management approach due to escalating international concern towards sustainable practices. Waste minimization, waste utilization and waste recycling as the key endeavours in waste management has been recognized as way of minimizing adverse effects on the environment (United Nations Environment Programme, 2017). By analysing these practices, restaurants may enhance the positive impact on the environment and become effectively efficient at the same time.

Environmental management policies help in leading businesses to the clear implementation of best practices. Such policies include the policies of regulation and enforcement, government incentives and setting the rules of business conduct that facilitate achievement of environmental goals (Bhat et al., 2022). Some of these have linked the effectiveness of waste management to strict compliance with regulatory provisions on areas like segregation at source and the use of environmentally friendly containers (Chen et al., 2021). Though, the results of these policies depend on the level of their execution and supervision. Specifically in the Sunyani Municipality, assessment of these policies gives information about how feasible and effective the mentioned policies are in addressing the restaurant waste problem.

Market-based instruments, deposit-refund systems, and the like have been identified to act as key influencer in the provision of economic incentives in sustainable waste management (Martin-Rios et al., 2022). Such incentives cause restaurants to embrace waste-to-resource and to involve themselves in recycling activities. This paper has shown that material savings embody realizable financial savings and the practicality of practicing circular economy, thereby recovering and reuse of wasted resources (Awasthi et al., 2021).

As it is the case with many food service industries located in other growing urban centres, the food service industry in Sunyani Municipality has its own challenges of waste management particularly on remnants of food products, packaging and disposable materials. Many problems associated with environment are attributed to improper disposal of wastes; for example, through causing congestion of landfills, and through polluting the environment, and economic problems through bearing the cost of disposal. However, there is still limited realization in restaurants within the identified area towards dealing with waste sustainably, and this has derailed the overall environmental as well as operational performance. This research seeks to assess the current state of waste disposal and management in the restaurant sector in Sunyani Municipality with particular reference to sustainable waste management practices of the vexing 3Rs: reduce, reuse, recycle.

Objectives of the Study

The main aim of this research is to assess strategic waste management practices in restaurants within the Sunyani Municipality. Specifically, the study seeks to:

(1) evaluate the strategic waste management practices employed in the food service sector, (2) assess the effectiveness of environmental management policies and their implementation in the management of restaurant waste.

(3) analyze the role of economic incentives in promoting sustainable waste management practices within the food service industry.

Significance of the Study

This study is significant because it addresses the growing problem of waste generation in the food service sector of Sunyani Municipality, a challenge common in urbanizing regions. By examining current waste management practices and their alignment with sustainability principles, the study provides practical insights into how restaurants can minimize environmental pollution, reduce the burden on landfills, and improve operational efficiency.

Furthermore, the findings will be valuable to policymakers, environmental agencies, and hospitality industry stakeholders by revealing how effective current environmental policies and economic incentives are in driving sustainable practices. This could lead to more informed policy formulation, targeted interventions, and improved regulatory frameworks that support sustainable development in the local hospitality industry.

Lastly, the study contributes to the academic field by enriching the body of knowledge on sustainable waste management in urban food service operations, and can serve as a basis for further research and development of innovative waste management strategies in similar contexts across Ghana and beyond.

LITERATURE REVIEW

Theories underpinning the study

Environmental Kuznets Curve (EKC) Theory

Environmental Kuznets Curve (EKC) Theory helps explain that degradation increases with the level of economic growth and that after reaching a specified level of income per capita, there is a decrease in the degradation until environment quality improves. This pattern is explained by the fact that as countries and regions advance to higher levels of development, they replace emphasis on industrialisation and pollution with concern for the environment and subsequent legislation (Grossman and Krueger, 1995). EKC hypothesis suggest that pollution can cause improvement in policies, technologies, and practices once the critical level of economic development is achieved (Dinda, 2004). This theory has been applied to study the nature of the implementation of strategies by different segments such as the sector under consideration or food service industry on environmental issues once economies transition.

The connection between the EKC theory and the study is the phenomenon that investigates the state of affairs of waste management practices in restaurants within the Sunyani Municipality because the area participates in the process of urbanization and economic growth. This paper recognizes that as the municipality develops economically it is probable to embrace the improved waste management as retail businesses and industries realize the overall efficiency of managing, preserving and recycling waste products. Through the analysis of factors that influence the economic development in regards to waste management in restaurants, this theory assists in determination of how restaurants in this region might move from a conventional way of waste disposal to a more sustainable systems as they adopt to growth (Stern, 2004). Knowledge of this progression can be useful for designing interventions designed to promote sustainability in the local food service sector.

Theory of Planned Behavior (TPB)

The Theory of Planned Behavior (TPB) is a psychological model that suggests individual behaviour is determined by three key factors: of self-reported practice and mean scores of attitudes, subjective norms and perceived behavioral control. Attitudes are the favorable or unfavorable assessment that the individual gives to performing the behavior; subjective norms are the perceived prescriptiveness of performing or not performing the behavior and perceived behavioral control is the perceived ease or difficulty of performing the behavior (Ajzen, 1991). From the TPB perspective the decision of restaurant managers for sustainable waste management can be influenced by their attitude toward sustainability policies, the attitudes of their peers or the expectations of the society to act environmentally friendly, and the perceived control over the resources that are necessary for efficient waste management policies. For instance, if managers consider that sustainable practices can be useful for their enterprise environmental and economic wise, and if managers feel that they are under pressure from the customers or some regulating organizations to minimize waste they will be likely willing to incept and practice waste reduction, recycling, and resource recovery.

The significance and applicability of the TPB theory to the current research is profound as the theory assists this work in conceptualising how restaurant managers in Sunyani Municipality could be influenced by their own beliefs and value systems and, the social influence pressure to engage in sustainable waste management practices. With this theory, one is able to evaluate impediments and enablers of waste management practices in local restaurants and weigh them with managerial and customers' views, the government and environmental

organizations. Knowledge of these motivational psychological and social factors is crucial in order to develop the right preventive measures that can lead to proper change of behavior amongst the food serving companies in the food chain to enhance waste management practices in Sunyani Municipality.

Circular Economy Theory

Circular economy is the new theory of economic cycle that is the complete opposite of the current linear economy, where goods are manufactured, consumed and disposed of. The CE model promotes minimisation of waste and altering the cycles of the products, materials and resources in the economy for as long as possible (Geissdoerfer et al., 2017). It draws out the characteristics of product and service to be long-lasting, reparable and recyclable and probes industries into redesigning the waste stream. In considering environmental-enabling in the context of waste management in the food service industry, the CE theory provides a conceptual understanding to rethink how restaurants can best eliminate or reduce waste, for instance by composting waste products, using biodegradable packaging, and or bringing into play recycling and upcycling.

The Circular Economy theory is applicable in this study because it will provide recommendations on how restaurants in Sunyani Municipality can embrace sustainable waste management strategies that embrace circularity. The theory puts forward the concept of waste as a valuable resource, hence persuading the restaurants to abandon the take-make-dispose mode of operation. A comprehension of how these principles may be implemented by restaurants will aid the determination of realistic measures to minimizing the negative effects on the external environment and increasing the yield per unit of input as deemed appropriate for this investigation. In the same vein, it can also be ascertained that the enhancement of circular economy practices that have been identified in this study can also be as a ready source of cost savings and operational advantages to restaurants with improved sustainability of the food service industry in Sunyani.

Empirical Review

Recent research reflects a growing consensus on the importance of adopting circular economy principles and waste valorization strategies across multiple sectors. Koul et al. (2021) propose a circular approach to agricultural waste management, emphasizing the urgency of timely utilization and the 3Rs (reduce, reuse, recycle) to enhance sustainability in agriculture. Their argument for integrating waste into the production cycle mirrors concerns raised by Chen et al. (2021) and Nicube et al. (2021), who examine plastic waste and food packaging, respectively. While Koul et al. focus on agricultural residues, Chen and Nicube extend the conversation to consumer-end waste, stressing that stakeholder collaboration and systemic regulatory frameworks are essential to achieving a sustainable circular economy. This shared perspective underscores the versatility of circular strategies, but it also highlights a gap; none of the studies delve deeply into how different regulatory environments impact practical implementation.

In the context of the food industry, Otles et al. (2021) and Awasthi et al. (2021) reinforce the relevance of circular principles by advocating for waste minimization and the valorization of food by-products. Otles et al. (2021) provide sector-specific solutions, while Awasthi et al. offer cross-sectoral innovations presented at a global forum. This synergy between practical industry strategies and broader interdisciplinary discourse highlights both the potential and complexity of adopting sustainable waste management practices. However, these studies stop short of evaluating long-term business incentives or the economic trade-offs of implementing such measures in small to medium food enterprises, particularly in developing contexts.

In contrast to the progress observed in agriculture and food service, research in the healthcare sector paints a more urgent and fragmented picture. Chrisholm et al. (2021) point to the lack of national guidelines and overreliance on incineration in underfunded African health systems, which raises environmental and health concerns. Kalantary et al. (2021) deepen this discourse by illustrating how the COVID-19 pandemic exacerbated medical waste challenges in Iran, calling for dynamic waste management models during crises. While both studies stress the need for systemic reform, they illustrate a sectoral imbalance; unlike agriculture or food service, healthcare waste management often lags due to policy gaps and crisis-driven responses rather than preemptive sustainability planning.

METHODOLOGY

Research Design

This study uses a descriptive cross-sectional research design to examine solid waste management practices in the foodservice industry of restaurants in Sunyani Municipality, Ghana. The approach quantifies data on waste classifications, readiness to reduce, reuse, and recycle, waste management strategic action plans, and the effectiveness of environmental management policies and practices (Gay, Mills and Airasian, 2009). The quantitative research strategy helps in gathering and analyzing data on solid waste generation in the restaurant sector.

Population and Sampling

The study involved managers and staff from 110 Sunyani Municipality restaurants, totaling 331 respondents (Sunyani Municipal Assembly, 2020). The staff provided information on solid waste classifications, readiness to reduce, reuse, and recycle, waste management strategic action plans, and the effectiveness of environmental management policies in the restaurant industry. Managers and supervisors also contributed to the research. In a study involving 331 respondents from the foodservice industry in Sunyani Municipality, convenience sampling was used to select the most proximate and available persons. This method was used to ensure all respondents were included (Welman, Kruger, and Mitchell, 2005; Zikmund, 2010).

Research Instruments

The data collection instrument is a crucial tool for social science research, involving the design, collection, construction, and evaluation of instruments (Bhandarkar and Wilkinson, 2010). A questionnaire was used for data collection, as it allows for a broad sample size to interview any topic. The study used a questionnaire designed to answer each research question on a five-point Likert scale (Hsu and Sandford, 2010). The employees' questionnaire consisted of 40 items, while the managers' questionnaire had 51 items. The questionnaires were divided into four parts: A, B, C, D, and E. The questionnaires collected information on demographics, waste classification, waste supply, waste management, and the effectiveness of environmental management policies and practices. The questionnaires were administered to employees and managers, with homogeneity values (Cronbach’s alpha) ranging from.73 to.89. The results ensured the instruments provided quality and usable data for analysis, comparing the Kumasi Metropolis and Sunyani Municipality restaurants' waste management practices. The study used self-administered instruments, a departmental introductory letter, and supervised responses from managers and employees, taking four weeks to complete the data collection exercise. The study involved participants signing an informed consent form, understanding that participation was voluntary and they could withdraw at any time. Confidentiality and anonymity were maintained throughout the process.

Data Processing and Analysis

This study sought to examine solid waste management practices in the foodservice industry of restaurants in Sunyani Municipality. Descriptive statistics were employed in the review of the data to address the research questions formulated to direct the study. Specifically, percentages, frequencies, means and standard deviations were used to analyze the questionnaire items.

RESULTS

Table 1: Demographic Characteristics of Respondents (n=331)

Variables	**Staff (n=245)**		**Managers (n=86)**	
Gender	**Freq.**	**%**	**Freq.**	**%**
Male	94	38.4	49	57.0

Female	151	61.6	37	43.0
Age group (Years)				
16 – 19	14	5.7	0	0
20 – 29	70	28.6	0	0
30 – 39	106	43.3	23	26.7
40 – 49	38	15.5	32	37.2
50 – 59	13	5.3	20	23.3
60 – 69	4	1.6	11	12.8
Educational level				
No formal education	81	33.1	13	15.1
JHS	126	51.4	23	26.7
SHS	38	15.5	23	26.7
Tertiary	0	0	27	31.4
Years of working experience				
1 – 5 years	58	23.7	17	19.8
6 – 10 years	80	32.7	23	26.7
11 – 15 years	49	20.0	20	23.3
16 – 20 years	33	13.5	17	19.8
Above 20 years	25	10.2	9	10.5

Source: Field data, 2023

From the findings it emerges that the majority of staff were female (61.6%), this was denote by 151 female respondents while male respondents comprised of 94 or 38.4% only. Among the managers, however, 57.0% (49) were males, while 43.0 % (37) were females.

The majority of staff members (43.3%, 106) was confirmed to be aged between 30 and 39, which also pointed to the rather youthful nature of the workforce. Moreover, 70 participants (28.6 %) were aged between 20-29 years and 38 (15.5 %) aged between 40–49 years. On the other hand, managers consisted of aged 40-49 years (37.2%, 32) as it is common with most organisations that top management consists of older persons. The 30–39 age group was also accounted for 26.7% (23) followed by the 50–59 age group at 23.3 % (20) and the 60–69 age group at 12.8 % (11), suggesting that the age distribution of managers was broader compared to the staff respondents.

Again, 51.4% of the personnel (n=126) had finished junior high school (JHS), while 33.1% of the workers (n=81) claimed to have no formal education. Only 15.5% (38) of the personnel had completed senior high school, and none had a university degree. Although most managers (31.4%, 27) had a tertiary education degree, 26.7% (23) had either a junior school school or a senior high school. The fact that fewer managers (15.1%, 13) lacked formal education suggested that management roles were favorably correlated with educational attainment.

When it comes to the years of experience staff 32.7% (80) have worked from 6 to 10 years and 23.7% (58) years of experience have been staff with experience not more than five years. Fewer staff (20.0%, 49) had 11–15 years of experience, slightly fewer had worked for 16–20 years (13.5%, 33) and fewer had worked for over 20 years (10.2%, 25). Likewise, 26.7 % of the managers who reported having significant working experience had more than 6 -10 years of experience; 23.3 % had 11-15 years of experience. Also, 17 (19.8 %) of the managers had 1–5 years or 16–20 years of exposure; only 9 (10.3 %) had more than 20 years.

Waste Management Strategic Action Plan for Sustainable Development of Restaurants

Strategic Action Plan for Sustainable Restaurant Creation in Sunyani Municipality. This study aim was to analyze strategic action plan for sustainable restaurant growth in waste management. The respondents' answers are seen in Table 2.

Table 2: Strategic waste management action plan for sustainable development for Restaurants

		statistic	**df**	**P**	**Mean difference**
Monitoring Adherence Strategy	Student's t	47.4	330	< .001	3.40
	Wilcoxon W	54946		< .001	3.50
Education and Training Strategy	Student's t	40.8	330	< .001	3.17
	Wilcoxon W	54946		< .001	3.00
Incentive Encouragement Strategy	Student's t	84.5	330	< .001	4.56
	Wilcoxon W	54946		< .001	5.00
Feedback Mechanism Strategy	Student's t	35.0	330	< .001	3.25
	Wilcoxon W	54946		< .001	3.00
Data Collection Strategy	Student's t	43.9	330	< .001	3.04
	Wilcoxon W	54946		< .001	3.00
Reuse and Recycling Enhancement Strategy	Student's t	66.3	330	< .001	3.71
	Wilcoxon W	54946		< .001	4.00

Table 2 illustrates a one-sample t-test evaluation of the efficacy of several strategic waste management initiatives for promoting sustainable development in restaurant settings are displayed in Table 2. The evaluation of each strategy was conducted by analysing its mean difference, which yielded valuable information regarding their effectiveness in encouraging sustainable waste practises. The findings demonstrate statistically significant beneficial benefits across all techniques, as evidenced by the large t-values and small p-values. The Monitoring Adherence Strategy exhibited a significant mean difference of 3.40 ($t = 47.4$, $p < 0.001$), underscoring its efficacy in promoting adherence to waste management protocols. The Education and Training Strategy demonstrated a significant positive impact (mean difference = 3.17, $t = 40.8$, $p < 0.001$). Similarly, the Incentive Encouragement Strategy also showed a substantial positive impact (mean difference = 4.56, $t = 84.5$, $p < 0.001$). The Feedback Mechanism Strategy yielded positive results as well (mean difference = 3.25, $t = 35.0$, $p < 0.001$). Additionally, the Data Collection Strategy exhibited a significant positive impact (mean difference = 3.04, $t = 43.9$, $p < 0.001$). Lastly, the Reuse and Recycling Enhancement Strategy demonstrated substantial positive effects (mean difference = 3.71, $t = 66.3$, $p < 0.001$). The Wilcoxon W tests

consistently shown support for the effectiveness of various tactics, so strengthening the robustness of the findings. The findings of this study emphasise the potential of employing strategic interventions to promote sustainable waste management practises in the restaurant industry.

Effectiveness of Environmental Management Policies and Practices Relative to Solid Waste Management in Restaurants.

This segment was meant to effectiveness of environmental management policies and practices relative to solid waste management in restaurants.

Table 3: Descriptive statistics of the Variables

	Solid Waste Management	Disposal Determination	Fee Charging	Designated Site	Approved Containers Provision	Sanction for Burning	Education Provision	Dumping Sanction	Monitoring Practice	Sewage By-Laws Implementation
N	331	331	331	331	331	331	331	331	331	331
Mean	4.40	4.93	4.74	3.90	4.30	3.28	3.01	3.63	3.43	4.97
Median	4	5	5	4	5	3	3	3	3	5
Mode	4.00	5.00	5.00	5.00	5.00	3.00	3.00	3.00	3.00	5.00
Sum	1455	1631	1570	1290	1422	1085	997	1201	1134	1646
Standard deviation	0.611	0.374	0.765	1.25	1.02	0.752	0.813	1.13	1.01	0.285
Variance	0.373	0.140	0.585	1.56	1.03	0.565	0.660	1.28	1.03	0.0811
Range	2	4	3	4	5	3	3	5	3	3
Minimum	3	2	2	1	1	2	2	1	2	2
Maximum	5	6	5	5	6	5	5	6	5	5
Skewness	-0.478	-4.98	-2.79	-0.988	-1.35	0.183	0.353	-0.0884	0.141	-10.4
Kurtosis	-0.641	34.3	6.30	-0.151	1.75	-0.249	-0.574	-0.504	-1.07	107
Shapiro-Wilk W	0.744	0.281	0.364	0.799	0.786	0.846	0.846	0.900	0.874	0.0676
Shapiro-Wilk p	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001

Source: Field Data, 2023

The descriptive statistics offer a complete summary of the variables pertaining to solid waste management within the restaurants that were examined (Table 3). The mean values represent the average scores for each variable, with "Solid Waste Management" exhibiting a mean value of 4.40. The precision of these estimations is reflected by the standard error of the mean. The measures of central tendency, specifically the median and mode, provide valuable insights regarding the concentration of responses for the variables "Disposal Determination" and "Approved Containers Provision (Amankwaah, 2023)." Both variables have a median and mode value of 5, indicating a notable concentration of responses around this particular value. The sum and range statistics provide information on the cumulative scores and the variability of replies. As an example, the study titled "Sanction for Burning" exhibits a broader spectrum of 5, signifying a greater degree of variability in the collected responses. The range of possible scores is demonstrated by the minimum and maximum

numbers, where the "Minimum" values span from 1 to 3 and the "Maximum" values span is 5. Skewness is a statistical measure that quantifies the degree of asymmetry in a distribution. In the present context, variables such as "Disposal Determination" and "Fee Charging" exhibit negative skewness, suggesting a propensity towards lower scores. Kurtosis is a statistical measure that quantifies the degree of thickness in the tails of a distribution. In the context of "Disposal Determination," greater values of kurtosis indicate the presence of heavier tails and the potential existence of outliers. The Shapiro-Wilk test yielded statistically significant p-values, indicating that the data for all variables exhibits considerable deviation from a normal distribution. This suggests that it is prudent to use caution when interpreting statistical tests that rely on the assumption of normalcy (Amankwaah, 2023).

Table 4: Correlation Matrix

		Solid Waste Management	Disposal Determination	Fee Charging	Designated Site	Approved Containers Provision	Sanction for Burning	Education Provision	Dumping Sanction	Monitoring Practice	Sewage By-Laws Implementation
Solid Waste Management	Pearson's r	—									
	p-value	—									
Disposal Determination	Pearson's r	0.205	—								
	p-value	< .001	—								
Fee Charging	Pearson's r	-0.116	0.199	—							
	p-value	0.04	< .001	—							
Designated Site	Pearson's r	0.410	0.101	-0.012	—						
	p-value	0.001	0.067	0.830	—						
Approved Containers Provision	Pearson's r	0.160	-0.063	0.020	-0.110	—					
	p-value	0.004	0.254	0.715	0.046	—					
Sanction for Burning	Pearson's r	0.207	0.223	0.230	-0.041	0.189	—				
	p-value	< .001	< .001	< .001	0.462	< .001	—				
Education Provision	Pearson's r	0.132	-0.037	0.005	0.177	0.124	0.267	—			
	p-value	0.016	0.503	0.928	0.001	0.024	< .001	—			
Dumping Sanction	Pearson's r	0.209	0.115	-0.180	0.230	-0.046	-0.060	-0.107	—		
	p-value	< .001	0.037	< .001	< .001	0.401	0.278	0.052	—		
Monitoring Practice	Pearson's r	0.025	-0.014	0.083	-0.047	-0.140	-0.076	-0.135	-0.126	—	
	p-value	0.645	0.797	0.132	0.397	0.011	0.166	0.014	0.022	—	
Sewage By-Laws Implementation	Pearson's r	0.295	-0.019	-0.032	0.146	-0.066	0.035	0.119	-0.116	-0.149	—
	p-value	<.001	0.737	0.560	0.008	0.229	0.521	0.030	0.035	0.007	—

Source: Field data, 2023

A significant and positive link has been observed between Disposal Determination and Solid Waste Management, with a correlation coefficient of 0.205 ($p < 0.001$). This implies that organisations that possess a well-defined approach to trash disposal are more inclined to exhibit efficient practises in managing solid waste on a broader scale. There is a positive association between fee charging and solid waste management, as indicated by a correlation coefficient of 0.116 ($p = 0.04$). This suggests a tenuous correlation between the implementation of trash disposal fees and the overall efficacy of waste management practises. A strong positive association was seen between the presence of a Designated Site and the implementation of Solid Waste Management practises ($r = 0.410$, $p < 0.001$). This implies that the mere existence of a designated site may serve as a robust indicator of efficient waste management. The relationship between the provision of approved containers and solid waste management is found to be positive and statistically significant ($r = 0.160$, $p = 0.004$). This suggests that organisations that offer authorised receptacles for the storing of waste may employ more efficient waste management strategies. The analysis reveals a noteworthy and statistically significant relationship between the imposition of sanctions for burning and the management of solid waste ($r = 0.207$, $p < 0.001$). This finding implies that institutions that enforce penalties for the incineration of waste likely to exhibit more effective waste management strategies as a whole. The present study reveals a noteworthy and statistically significant association between the provision of education and the management of solid waste ($r = -0.132$, $p = 0.016$). This suggests that the provision of education regarding waste management has the potential to enhance the efficiency of trash practises. The present study reveals a noteworthy and statistically significant association between the implementation of dumping sanctions and the management of solid waste ($r = 0.209$, $p < 0.001$). This observation suggests that organisations that enforce penalties for unauthorised disposal of waste may exhibit more effective waste management strategies on a broader scale. The results of the analysis indicate that there is no statistically significant relationship between Monitoring Practise and Solid Waste Management ($r = -0.025$, $p = 0.645$). This implies that the presence of monitoring practises alone may not be a robust indicator of the effectiveness of waste management. The present study demonstrates a robust and statistically significant association between the implementation of Sewage By-Laws and the management of solid waste ($r = 0.295$, $p < 0.001$). This finding suggests a correlation between the enforcement of sewage regulations and the overall efficiency of waste management practises. In general, positive correlations signify a positive association, whereas negative correlations imply a negative association. The significance values aid in assessing the dependability of these associations.

Table 5: Effectiveness of Environmental Management Policies and Practices on Solid Waste Management in Restaurants

Predictor		**Estimate**	**SE**	**t**	**p**
Intercept		1.23486	0.1740	7.0980	< .001
Disposal Determination		0.15520	0.0584	2.6575	0.008
Fee Charging		0.15189	0.0556	2.7331	0.007
Designated Site		0.18583	0.0524	3.5450	< .001
Approved Containers Provision		0.24058	0.0478	5.0312	< .001
Sanction for Burning		0.27556	0.0448	6.1548	< .001
Education Provision		0.17046	0.0616	2.7682	0.006
Dumping Sanction		0.09500	0.0452	2.0999	0.037
Monitoring Practice		-0.03873	0.0415	-0.9331	0.352
Sewage By-Laws Implementation		0.11367	0.0431	2.6344	0.009
R	0.691				

R2	0.477				
F-statistic	7.24				
P-value	0.001				
DW statistics	1.41				
P-value	<.001				
VIF	1.3				

Source: Field data, 2023

The model fit measures for Model suggest a satisfactory fit with the data. The obtained coefficient of determination (R^2) is 0.477, indicating that the model explains approximately 47.7% of the variability observed in the dependent variable. The total model test, indicated by the F-statistic, is 7.24 with 37 and 293 degrees of freedom for the numerator and denominator, respectively (Table 5). The p-value associated with the model is less than 0.001, suggesting that there is strong evidence to support its statistical significance. The findings indicate that the model possesses a noteworthy capacity to explain, including a considerable fraction of the fluctuations observed in the data (Amankwaah and Baidoo, 2023). Nevertheless, it is imperative to analyse these metrics in conjunction with the particular context of the research and take into account other pertinent fit indices in order to completely evaluate the model.

The analysis reveals a statistically significant positive correlation between Disposal Determination and effective waste disposal, as indicated by a coefficient of 0.15520. This implies that a rise in the Disposal Determination variable is linked to a greater probability of successful trash disposal. On the other hand, it is seen that Fee Charging has a positive coefficient of 0.15189, suggesting that larger values are associated with a increased probability of achieving successful waste management in response to the implementation of fees. The variable "Designated Site" exhibits a postive coefficient of 0.18583, indicating that an upward change in this variable is linked to an increase in the effectiveness of waste management. The Approved Containers Provision demonstrates a significant positive correlation with a coefficient of 0.24058, indicating that greater values are associated with a fall in the probability of achieving successful waste management through the provision of approved containers.

In the context of waste management, it can be observed that the imposition of burning sanctions is associated with a positive coefficient of 0.27556. This coefficient signifies an increase in the effectiveness of waste management as the magnitude of burning sanctions increases. The analysis reveals a statistically significant positive link between Education Provision and effective waste management, as indicated by the coefficient of 0.17046. This implies that higher levels of Education Provision are connected with a increase in the chance of effectively managing waste through education provision. In a similar vein, the variable of Dumping Sanction has a positive correlation with a coefficient of 0.09500, indicating that an escalation in this factor is linked to a rise in the probability of successful waste management as a response to the implementation of dumping penalties. From a negative perspective, the Monitoring Practise variable exhibits a statistically insignificant coefficient of -0.03873, indicating a negative association with the probability of achieving effective waste management. Nevertheless, the obtained p-value of 0.352 suggests that the observed association lacks statistical significance. Finally, the implementation of sewage by-laws demonstrates a positive impact, as indicated by a coefficient of 0.11367. This suggests that an increase in the variable is correlated with a greater probability of achieving successful waste management through the enforcement of sewage by-laws.

Potential Economic Incentives for Sustainable Waste Management

This section analyse the potential economic incentives for sustainable waste management. The analysis is seen in Table 6:

Table 6: potential economic incentives for sustainable waste management

	N	Mean	SD
Market-Based Instruments	331	3.23	1.286
Extended Producer Responsibility (EPR)	331	3.57	1.086
Pay-As-You-Throw Programs	331	3.56	1.114
Deposit-Refund Systems:	331	3.59	1.070
Green Certification and Labeling	331	3.57	1.086
Circular Economy Business Models	331	3.62	1.082
Waste-to-Energy and Resource Recovery	331	3.60	1.055
Public-Private Partnerships (PPPs)	331	3.51	1.169
Innovative Financing Mechanisms	331	3.42	1.127
Consumer Awareness Campaigns	331	3.42	0.983

The Table 6 shows the prospective economic incentives for the implementation of sustainable waste management, as indicated by the perspectives of respondents, demonstrates a range of favourable attitudes. Circular economy business models exhibit a notable distinction with a mean score of 3.62, suggesting a relatively robust and consistent positive perception among the participants. Additional incentives, such as deposit-refund schemes and waste-to-energy/resource recovery, are also subject to favourable ratings (mean scores ranging from 3.57 to 3.60) with relatively less variability, indicating a higher degree of consensus across perspectives. On the other hand, market-based instruments and innovative finance methods are regarded with a more moderate perception, with means of 3.23 and 3.42, respectively. This indicates a broader range of perspectives, as seen by higher standard deviations. The results mentioned above offer significant insights into the perceived efficacy and acceptance of particular economic incentives, hence providing essential direction for the formulation and execution of sustainable waste management strategies.

DISCUSSION OF THE FINDINGS

Waste Management Strategic Action Plan for Sustainable Development of Restaurants

The results pertaining to the efficacy of strategic waste management initiatives in fostering sustainable development in restaurants are consistent with the existing body of research on waste management practises within the foodservice sector. The Monitoring Adherence Strategy's efficacy aligns with the wider discourse surrounding the significance of regulatory frameworks and monitoring procedures within waste management policies, as evidenced by the Environmental Sanitation Bye-Laws and Monitoring Practise. The importance of actively monitoring and enforcing adherence to established waste management practises has been acknowledged as a crucial factor in achieving favourable outcomes in waste management (Torrente-Velásquez et al., 2021). This discovery provides evidence in favour of the concept that implementing a methodical monitoring strategy can make a substantial contribution to the effectiveness of waste management endeavours.

The Education and Training Strategy has been found to have a beneficial impact, aligning with existing literature that highlights the significance of education and training in increasing awareness and knowledge among restaurant personnel (Martin-Rios et al., 2022). Education and training programmes have been widely recognised as effective mechanisms for encouraging environmentally responsible behaviour and enhancing waste management practises, as supported by the Hines ERB Theory. The Incentive Encouragement Strategy

has been found to have a significant beneficial effect, which is consistent with existing research on the use of economic incentives in waste management (Bhat et al., 2022). The influential role of incentives in promoting sustainable waste management practises has been widely acknowledged due to its ability to motivate individuals. This discovery provides further evidence for the ongoing discourse about the efficacy of economic incentives in shaping behaviour and fostering conscientious waste management behaviours.

The favourable effects of implementing the Feedback Mechanism Strategy align with existing scholarly literature that highlights the significance of ongoing enhancements in waste management methodologies (Schübeler et al., 2016). The implementation of feedback systems has been widely acknowledged as a valuable strategy for fostering learning and enhancing the effectiveness of waste management strategies. The correlation between the Data Collection Strategy and a favourable outcome is consistent with existing research that emphasises the significance of utilising data-driven decision-making in the realm of efficient waste management (Awasthi et al., 2021). The process of collecting data facilitates a more knowledgeable and tactful approach towards waste management, hence enhancing the overall efficacy of trash reduction endeavours.

The Reuse and Recycling Enhancement Strategy has been found to have significant positive impacts, aligning with existing literature that promotes the 3Rs principle (reduce, reuse, recycle) within the context of waste management, namely the Integrated Solid Waste Management strategy. The recognition of the importance of improving practises related to reuse and recycling has been widely acknowledged as a fundamental aspect of sustainable waste management in diverse settings. The outcomes of this study highlights the potential usefulness of strategic interventions in encouraging sustainable waste management practises in restaurants. The assertion that there is no universally applicable solution is consistent with the acknowledgment of the heterogeneous characteristics of waste management issues and the imperative for customised tactics within the foodservice sector (Asase, 2013).

Effectiveness of Environmental Management Policies and Practices Relative to Solid Waste Management in Restaurants.

The study shows that the significance of commitment and dedication in waste minimization efforts, which aligns with the observed statistically significant positive association between Disposal Determination and successful trash disposal (Cummings, 2017). The correlation between the implementation of fees for waste management services and the achievement of successful waste management aligns with the wider discourse on economic incentives in waste management. This underscores the significance of fees and charges in shaping individual behaviour and fostering responsible practises in trash disposal (Bhat et al., 2022).

The research emphasises the importance of infrastructure and appropriate equipment in waste management practises, which aligns with the positive effects shown in waste management through the implementation of designated garbage disposal locations and certified containers (Schübeler et al., 2016). The implementation of suitable receptacles and designated disposal locations plays a significant role in enhancing the overall efficacy of waste management systems. The observed positive link between more stringent rules on burning practises and the successful implementation of waste management strategies is consistent with scholarly discourse surrounding the significance of regulatory frameworks within waste management policies. This alignment is evident in the Environmental Conservation Agency Act and the Pesticides Control and Management Act, which emphasise the relevance of regulatory measures in effectively managing trash. This statement underscores the importance of implementing well-defined rules and imposing appropriate fines as a means to discourage activities that have detrimental effects on the environment. Likewise, the correlation between Education Provision and waste management practises aligns with existing scholarly research that emphasises the impact of educational interventions on shaping waste management behaviours (Hines ERB Theory).

The positive association regarding Dumping Sanction implies that the implementation of sanctions for unlawful dumping is linked to enhanced waste management practises. This discovery aligns with existing scholarly literature that recognises the importance of enforcement mechanisms in discouraging illegal and environmentally detrimental behaviours, as exemplified by the Environmental Sanitation Bye-Laws. Nevertheless, the outcome for Monitoring Practise, albeit lacking statistical significance, is consistent with the existing literature's recognition of the intricacies involved in evaluating the influence of monitoring on the

success of waste management (Torrente-Velásquez et al., 2021). This finding implies that the sheer existence of monitoring does not necessarily ensure heightened efficacy, underscoring the importance of adopting a thorough methodology.

Potential Economic Incentives for Sustainable Waste Management

The results pertaining to economic incentives in promoting sustainable waste management are consistent with prior scholarly works, underscoring the significance of comprehending stakeholder perceptions and preferences. The Stakeholder Theory, developed by Freeman in the mid-1980s, emphasises the importance of incorporating the interests of various stakeholders in order to ensure the long-term viability of enterprises. This theory aligns with the favourable acceptance of circular economy business models. The concepts of the circular economy, which prioritise sustainability and resource efficiency, are in line with the wider framework of corporate social responsibility (CSR) and stakeholder engagement in waste management practises, as outlined in Stakeholder Theory. Additionally, the support for deposit-refund schemes and waste-to-energy/resource recovery aligns with empirical research on waste management preparedness in various geographical areas. An example of this may be seen in the research conducted by Yeboah (2017) in the Sunyani Municipality, where the significance of public-private partnerships and administrative enhancements in achieving efficient solid waste management is underscored. The collective acceptance of these incentives by the participants indicates their potential effectiveness in different situations, which is consistent with the focus on shared accountability in waste management (Nshimiyimana, 2015; Ebrahiem, 2015).

Conversely, the somewhat tempered perspective about market-based tools and novel financing approaches underscores the necessity for additional investigation and effective dissemination, according with the principles of Strategic Choice Theory. According to this Strategic Choice Theory, it is said that in order to attain success, organisations must adopt a strategic approach that encompasses not only internal matters but also external factors, including environmental considerations. The necessity for adaptation and realignment in response to changing conditions is underscored by the varied viewpoints on market-based tools and new finance methods, hence emphasising the significance of continuous engagement with stakeholders, as posited by Strategic Choice Theory. The proposition for employing strategic communication and customization to effectively address reservations is in accordance with the Hines Environmentally Responsible Behaviour (ERB) Theory. This theory underscores the significance of various factors, including individual intentions, internal and external influences, and structural systems, in shaping environmentally responsible actions. Effective communication and education have a crucial role in shaping individuals' behavioural intentions and fostering a comprehensive comprehension of the advantages linked to market-based and creative financial strategies, as proposed by the Hines ERB Theory.

CONCLUSIONS

This study critically examined sustainable waste management practices in the food service industry within the Sunyani Municipality by evaluating strategic action plans, environmental management policies, and economic incentives. The results confirm that specific strategies, such as Incentive Encouragement ($t = 84.5$, $p < 0.001$) and Reuse and Recycling Enhancement ($t = 66.3$, $p < 0.001$), have the most significant positive impact on promoting sustainable waste practices in restaurants. Similarly, Monitoring Adherence ($t = 47.4$, $p < 0.001$) and Education and Training ($t = 40.8$, $p < 0.001$) strategies proved highly effective, indicating the importance of structured training and accountability mechanisms in achieving environmental goals. The effectiveness of environmental management policies was also validated by the statistical analysis. For instance, variables like Sanction for Burning ($\beta = 0.27556$, $p < 0.001$), Approved Containers Provision ($\beta = 0.24058$, $p < 0.001$), and Designated Site availability ($\beta = 0.18583$, $p < 0.001$) were strongly associated with improved waste outcomes. The overall model explained 47.7% of the variance in waste management effectiveness ($R^2 = 0.477$, $F = 7.24$, $p < 0.001$), indicating a solid model fit. Furthermore, the study explored economic incentives and found that Circular Economy Business Models (mean = 3.62) and Waste-to-Energy and Resource Recovery initiatives (mean = 3.60) received the highest support from respondents, while Deposit-Refund Systems (mean = 3.59) and Green Certification (mean = 3.57) also scored well, indicating their perceived importance in encouraging sustainability. However, challenges remain. The findings show limited statistical significance for Monitoring Practices in policy enforcement ($\beta = -0.03873$, $p = 0.352$), suggesting that monitoring alone, without

accompanying enforcement or feedback, is insufficient. Additionally, public education efforts and awareness campaigns, while moderately effective (Education Provision $\beta = 0.17046$, $p = 0.006$), need to be more comprehensive and sustained. Overall, this study provides strong empirical evidence that targeted strategic interventions and well-enforced environmental policies, combined with appropriate economic incentives, significantly enhance sustainable waste management practices in the food service sector.

Limitations of the Study

The research provides beneficial information about sustainable waste management in the food service sector of Sunyani Municipality, but confronts numerous constraints. The collection of data in Sunyani restaurants creates limits that affect how well the results apply to other areas of Ghana outside Sunyani because of varied population traits and regulatory standards and urban infrastructure elements. Data from self-reported questionnaires could have been affected by social desirability bias because respondents may have over-reported their sustainable practices in the Sunyani Municipality food service sector. Because of using a cross-sectional research design, this study provides one-time information, lacking the ability to follow waste management patterns over extended periods and seasonal changes. The fact that actual observations of reported practices are not verified by independent sources prevents the confirmation of reported data sustainability practices.

RECOMMENDATIONS

1. Research extending beyond Sunyani Municipality should be conducted to achieve more universal findings because the present study focuses on a single municipality. Studying sustainability in waste management practices through multiple municipalities will deliver a better overall perspective of how the diverse regulatory situations affect waste management across Ghana.

2. Future research should add observational evaluation with periodic audits to self-reported data methods because it will generate reliable documentation about real-world actions. The methods help establish proper response validation, which identifies discrepancies between what people report and their actual actions.

3. Future research on sustainable waste management should adopt combined approaches by implementing quantitative questionnaires with qualitative techniques like interviews and focus groups to address data collection challenges. Using this combination of research methods will deliver a fuller understanding regarding waste management decision motivators and restrictions, as well as situational elements that impact these decisions.

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