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Waste Management and its Effect on Employee Performance in Nakuru Water and Sanitation Company (NAWASCO), Kenya

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Abstract

Despite the documented evidence underlining the importance of waste management against the backdrop of rising population and increased waste generation, there is scarcity of empirical literature linking waste management to employee performance. This study was, therefore, conducted with the specific objective of examining the effect of waste management on performance of employees working at Nakuru Water and Sanitation Company. A cross-sectional research design was adopted alongside quantitative methods. The 81 employees attached to the technical and operations or production departments of the company constituted the study population. A census design was adopted due to the relatively small study population. A structured questionnaire facilitated data collection. With the assistance of the Statistical Package for Social Sciences tool, the collected data were analyzed using both descriptive and inferential statistics. The results which were presented in table format indicated that there existed a positive, strong and statistically significant relationship between waste management and employee performance r = 0.980; p = 0.000) at p-value = 0.05. Also, the results indicated that the effect of waste management on employee performance was statistically significant (t = 34.726; p = 0.000). The null hypothesis which stated that the effect of waste management on employee performance was not significant, was rejected. The study concluded that waste management played a crucial role with regard to performance of employees working NAWASCO. The study recommended that NAWASCO and other water and sanitation or sewerage companies in Kenya should ensure that there is effective waste management as well as highly performance employees.

Keywords: Employee performance, Nakuru Water and Sanitation Company, waste generation, waste management

Background of the Study

The production of waste has continued to be of great concern all over the world. Most of this waste is generated by humans through increased domestic and industrial activities (Brunner & Rechberger, 2014). Waste is generally defined as the materials which are thrown away and includes such objects as refuse and garbage as well as materials disposed through the sewer (Davis & Masten, 2004). A broader definition of waste is any material or object which may or may not have served its intended purpose or use and the owner has no intention of taking responsibility for its ownership or to continue keeping it, and is ready to discard it (Igbinomwanhia, 2011). Waste management involves provision of hygienic, efficient and economic storage, collection, transportation and treatment or disposal of waste without polluting the environment (Igbinomwanhia, 2011).

The increase in human waste has not only been in form of quantity, but also in variety (Vergara & Tchobanoglous, 2012). Unlike several decades ago when the human population was relatively low, the current huge population is associated with unprecedented masses of wastes. In support of this assertion, the rise in population globally has persisted to play a major role in the generation of waste particularly in urban areas. This has, needless to say, become a major issue of concern. Therefore, waste management is a concept that has come to presently define the status of water sanitation and sewerage globally and in respective countries (Amasuomo & Baird, 2016) including Kenya. On the same note, it is postulated that the issue of waste management has become one of the prerogatives for both the governments and private entities (Akinsemolu, 2020).

A report by the British Safety Council (2014) indicated that that countries like Spain and Poland account for higher number of occupational injuries and fatalities as opposed to other countries such as France, Germany and Italy. Nonetheless, the Bureau of Labor Statistics (2015) reported that two million and three million employees suffered in the United Kingdom and the United States respectively from work related injuries and fatalities or both. The self-reported work-related ill-health is also on escalation.

It is asserted that there are many benefits and challenges associated with waste management in African nations (Akinsemolu, 2020). In Nigeria, solid waste management is a serious environmental challenge in majority of cities. In the country, waste generation is approximately 42 million tones on average every year. In Sub-Saharan Africa (SSA), the annual generation of waste is estimated at 62 million tones (Chinedu, Ezeibe, Anijiofor, & Daud, 2018). Therefore, it is apparent that much of the waste is generated in Nigeria, probably due to its high population.

The challenge of waste management affects every person and institution in the Kenyan society. The National Environment Management Authority (NEMA) developed a solid waste management strategy that sought to establish a common platform to enable stakeholders to take action to systematically improve waste management in Kenya (Republic of Kenya, 2015). Statistics further indicate that there has been increased urbanization which is occasioned by increased rural-urban migration. The aforesaid has resulted in an increase in solid waste generation. However, the increased solid waste generation has not been matched by capacity to manage the generated waste (Ondiba, 2016).

Employee performance comprises of documented results of individual employee against the set standards (Mwangangi, 2019). It is noted that organizations are steadfastly deploying sustainable techniques aimed at attracting and retaining procedures with the workforce (Cassio, 2014). Nonetheless, employee behaviour at the workplace influence employee performance. It is concurred that employee performance is best described by employee willingness and ability in aiding their organizations to succeed (Bernadin, 2012). On the same note, effective psychological work-related state of mind influences employee's performance. However, it is not apparent how waste management is related to employee performance.

Statement of the Problem

Employee performance is very critical to the general organizational performance. The importance of employee performance is underlined by the findings of a past study which indicated that the Nairobi City Water and Sewerage Company Limited had put in place a management process for employee performance with the view of enhancing the organizational performance (Mbugua, 2011). Although, it is documented that waste management is a serious issue, there is hardly any empirical evidence linking it to performance of employees especially in water companies in Kenya.

Purpose

To put into perspective waste management and how it affects performance of employees working ant Nakuru Water and Sanitation Company.

Objective

To determine the effect of waste management on employee performance at Nakuru Water and Sanitation Company.

Null Hypothesis

H_{01}: There is no significant effect of waste management on employee performance at Nakuru Water and Sanitation Company.

Literature Review

Under this section, the theory and empirical review pertinent to waste management as well as employee performance are reviewed.

Waste Management Theory

Pongrácz, Phillips and Keiski propounded Waste Management Theory in 2004. This theory cohesive body of knowledge on waste and waste administration. The theory was inaugurated on great expectancy that waste management is meant to thwart waste from causing physical and mental harm to either human health or the surroundings. It focuses on waste reduction. Waste reduction obliges that firms commit themselves to increase the proportion of non-waste. This can be achieved through adequacy waste treatment, proper disposal and recycling. Waste signifies a loss of valuable resources in the form of materials or energy. This theory is relevant to this study as it embarks on culture of safety at workplace that allow maximum utilization of human resource capacities.

Waste Management and Employee Performance

The reviewed literature touch on waste management and performance of employees. According to Christensen (2010) waste is defined as unwanted left overs, unused product or materials that have no marginal utility to their users. Waste materials are discarded after siphoning their usefulness. They are disposed after they cease to be useful. It is asserted that accumulation of waste material results in increased operational costs. Ochoro (2016) in her study on strategic factors affecting sustainable industrial management, established that waste treatment, suitable disposal mechanism and recycling process are too expensive to administer.

An effective waste management system leads to a motivated workforce that is more productive and committed. This means that waste disposal in organizational setting influences the performance of employees. In addition, improper or unattended industrial waste attracts rats and mosquitoes that live and breed in sewage areas. Such vectors transmit life-threatening diseases such as endemic typhus, bubonic plague and malaria. Mosquitoes breed in unattended cans and tires that collect water, and can transmit diseases such as malaria and dengue. Rats search food and shelter in landfills and sewage, and they can transmit diseases such as leptospirosis and salmonellosis (Midika, 2016).

Several studies have linked significance of waste management to employee's performances. Pearce (2015) examined the relationship between waste administration and employee performance in the United States. A cross-sectional research design was adopted. The results of the study were clear that a strong waste reusing activity was a powerful method for waste administration in the US. Thus, the environment which had a successful strong waste reusing activity was sublimely spotless. The study concluded that successful waste reusing procedures were the most ideal approach of waste management.

Mulder (2014) additionally conducted a study on how collection equipment influenced employee performance. The study results indicated that there were three essential types of collection equipment. These included human fueled, creature controlled and the motor controlled equipment. While inspecting the equipment that was progressively viable in collection of strong waste. The mechanized collection equipment (motor controlled) was noted to be extremely successful in collection of tons of waste.

Liu (2017) conducted a study on the provincial local waste disposal in five areas of China. The objective of the study was to break down the various kinds of local waste disposal in rustic China and the central point that influence country family unit waste disposal. Stratified random sampling was employed to draw respondents from the study population. According to the study findings, family information was utilized to depict the disposal of local waste in provincial China. Local trash and natural waste econometric models were evaluated to measure the significant determinants of family local trash and human excrete disposal. In light of econometric investigation, it was evident that pay development, rising population, and transportation enhancements had essentially improved household trash disposal, yet adversely influenced the reusing of human excreta. The provision of a sufficient trash collection administration had the best consequences for waste collection and management.

Conceptual Framework

According to conceptual framework shown in Figure 1, the independent variable was waste management while employee performance constituted the dependent variable. The two study constructs were operationalized using measurable indicators. It was presumed that there existed a relationship between waste management and employee performance. This presumption guided the study.

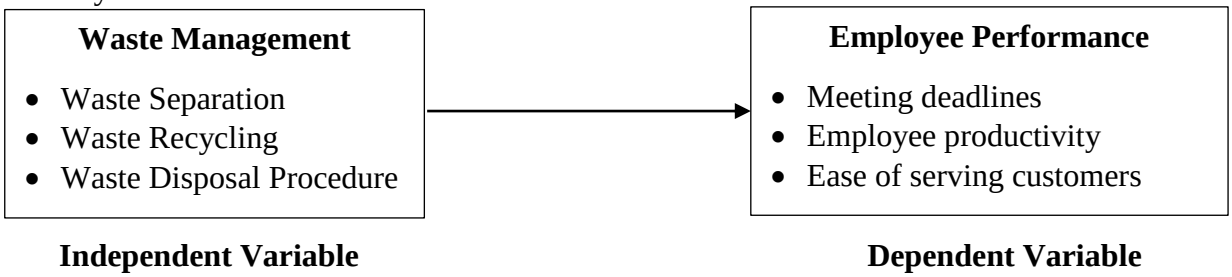

Figure 1: Conceptual Framework

Methodology

The methodology demonstrates the step-by-step procedure which was followed in conducting the study. The steps involved research design, study population, sampling procedure, research instruments, data collection procedure and methods of data analysis. A cross-sectional research design was adopted by this study. This was informed by the fact that the study was carried out at a particularly point in time. It is asserted that cross-sectional studies examine a given phenomenon or phenomena at a specific time (Saunders, Lewis, & Thornhill, 2007). Such studies often employ the survey strategy (Robson, 2002). The study also employed quantitative methods which are associated with survey research.

The study population constituted staff working with Nakuru Water and Sanitation Company (NAWASCO) particularly those drawn from technical as well as production/operations departments. The choice of these staff was founded on the fact that they were directly concerned with management of waste at the company. They totaled 81 in number and were distributed across the two departments in a ratio of 38 to 43 respectively. Granted that the total number of employees was considerably small, census design was adopted. Census is employed in a research study where it is possible to collect and analyze data from every possible case or participant or group member (Saunders, et al., 2007). The foregoing was feasible in this study since all employees attached to the technical and operations/production departments were involved.

Given that the study adopted quantitative methods, a structured questionnaire was used in data collection. It is asserted that quantitative methods are characterized by surveys and questionnaires (Castellan, 2010). The questionnaire consisted close-ended data items which were in conformity to Likert scale. Reliability was tested using the Cronbach's alpha coefficient. The two study constructs (waste management, and employee performance) returned alpha values above 0.7, which is the recommended minimum threshold for internal consistency reliability. The collected data were analyzed with the aid of the Statistical Package for Social Sciences (SPSS) Version 25.0. Frequencies, percentages, means and standard deviations were the

descriptive statistics used in the analysis. Correlation and regression analyses were the inferential statistics employed to illustrate the effect of waste management on employee performance. The following regression model guided the study.

$Y = \beta_0 + \beta_1 X_1 + \varepsilon$

Where;
Y = Employee performance
$\boldsymbol{\beta_0}$ = Constant
$\mathbf{X_1}$ = Waste Management
$\boldsymbol{\varepsilon}$ = Error margin of respective regression models
$\boldsymbol{\beta_1}$ to $\boldsymbol{\beta_4}$ = Coefficients of independent variables

The results of the analyses were presented in tabular format.

Results, Interpretations and Discussion

The response rate, descriptive statistics as well as inferential statistics are presented in this section in that order. The results are interpreted and discussed relative to past empirical studies.

Response Rate

The number of questionnaires filled and collected vis-à-vis the total number of questionnaires issued to the study participants constitute the response rate. In respect on the present study, a total of 81 questionnaires were administered on the technical and operations/production staff working with NAWASCO. Out of these questionnaires, 52 were filled are returned. This translated to 64.2% response rate. The relatively high response rate was partly informed by the assurance given to the respondents that their privacy and confidentiality would be upheld during and after data collection. It is postulated that research survey response rate is highly influenced by among other factors, the assurance of both confidentiality and privacy given to the respondents (Saleh & Bista, 2017).

Descriptive Results, Interpretations and Discussion

The study put into perspective the opinions of the technical and operations/production staff working with NAWASCO regarding both waste management and their performance. The pertinent results are presented in Tables 1 and 2. It is important to note that N, SA, A, NS, D, SD, M, and Std Dev represent the number of participants (52), strongly agree, agree, not sure, disagree, strongly disagree, mean, and standard deviation.

Table 1: Descriptive Statistical Results on Waste Management

Propositions on Waste Management	N	SA	A	NS	D	SD	M	Std Dev
The company separates waste materials before their recycling	52	53.8	36.5	1.9	5.8	1.9	4.35	.926

The company has employed cleaners who collects waste materials on a daily basis to create safe environment	52	57.7	25.0	7.7	3.8	5.8	4.25	1.135
The company recycles their waste materials to create a safe environment for the employees	52	50.0	34.6	7.7	3.8	3.8	4.23	1.022
The company disposes the wastes to the government dumpsites to create clean environment for the employees	52	48.1	40.4	1.9	5.8	3.8	4.23	1.022
The company has installed waste collection bins within the organization	52	40.4	48.1	3.8	7.7	0.0	4.21	.848

In accordance with the findings shown in Table 1, most of the surveyed staff strongly admitted that the company separated waste materials prior to their recycling (strongly agree = 53.8%), and that the said firm had employed cleaners who collected waste materials every day in order to create a safe environment for the employees (strongly agree = 57.7%). It was generally agreed (mean = 4.23) by the respondents that Nakuru Rural Water and Sanitation Company Limited recycled its waste materials to create a safe working environment, and also that it disposed the wastes to the government dumpsites with the same objective. In respect of the aforesaid two assertions, the views of the respondents were considerably divergent (std dev = 1.022). Lastly, the study revealed that a majority of the respondents either agreed (48.1%) or strongly agreed (40.4%) that the water company had installed waste collection bins within the organization. In respect of the foregoing, the respondents were generally in agreement (mean = 0.848) and their views were considerably similar (std dev = 0.848).

Table 2: Descriptive Statistical Results on Employee Performance

Propositions on Employee Performance	**N**	**SA (%)**	**A (%)**	**NS (%)**	**D (%)**	**SD (%)**	**M**	**Std Dev**
Employee loyalty has not been affected by an ample work environment	52	7.7	11.5	3.8	38.5	38.5	2.12	1.263
At NAWASCO, employees have difficulties in serving customers	52	11.5	3.8	7.7	34.6	42.3	2.08	1.311
Though there is ample work environment, employee satisfaction levels have reduced	52	1.9	5.8	7.7	30.8	53.8	1.71	.977
Employees are rarely able to meet their work deadlines	52	1.9	5.8	0.0	32.7	59.6	1.58	.915
The conducive work environment hardly affects	52	0.0	0.0	9.6	32.7	57.7	1.52	.671

the productivity of employees								
I am hardly satisfied with the environment at my workplace	52	0.0	5.8	1.9	28.8	63.5	1.50	.804

According to the results shown in Table 2, it is apparent that the participating staff generally disputed all propositions regarding employee performance at NAWASCO (mean ≈ 2.00). They on average disagreed, albeit with significantly varying opinions, that employee loyalty had not been affected by an ample work environment (mean = 2.12; std dev = 1.263), and that they had difficulties in serving customers (mean = 2.08; std dev = 1.311). A majority of the respondents strongly disagreed that although there was ample work environment, the employees' satisfaction levels had reduced (SD = 53.8%), they were rarely able to meet their work deadlines (SD = 59.6%), and that they were hardly satisfied with the environment at their workplace (SD = 63.5%). Besides, just 9.6% of the staff who were not sure, the rest were unanimous in disregarding the assertion that the conducive work environment hardly affected their productivity (D & SD = 90.4%; mean = 1.52; std dev = 0.671).

Inferential Results, Interpretations and Discussion

With the objective of seeking to establish the relationship between waste management and employee performance as well as how the stated management affected the performance of employees working with NAWASCO, correlation and simple linear regression analyses were conducted. The results are as shown in Tables 3, 4, 5, and 6.

Correlation between Waste Management and Employee Performance

The Pearson's Product Moment Correlation Coefficient was used to determine the relationship between waste management and performance of employees at NAWASCO. The relevant results are as shown in Table 3.

Table 3: Correlation between Waste Management and Employee Performance

		Employee Performance
Waste Management	Pearson Correlation	.980**
	Sig. (2-tailed)	.000
	N	52

****. Correlation is significant at the 0.01 level (2-tailed).**

Apparently, the results of correlation analysis shown in Table 3 indicated that there existed a positive and strong relationship between waste management and employee performance (r = 0.980). The aforesaid relationship was also established to be statistically significant (p = 0.000) at p-value = 0.05. These results were interpreted to mean that, by enhancing waste management at NAWASCO, there were chances that the performance of employees would be improved greatly and substantially. These results underpinned the huge importance of effective waste management particularly in the light of employee performance. Moreover, the results led to the inference that water and sanitation companies which ensured effective waste management were bound to have highly performance employees. On the contrary, similar firms which did not ensure proper waste management were likely to have underperforming staff.

Regression Analysis of Waste Management against Employee Performance

In assessing the effect of waste management on employee performance, simple linear regression analysis was conducted. The results of this analysis are as demonstrated in Tables 4, 5, and 6.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.980[a]	.960	.959	.19051

a. Predictors: (Constant), Waste Management

In accordance with the results of coefficient of determination shown in Table 4 ($r^2 = 0.960$), it was revealed that waste management explained 96.0% of variation in employee performance. Only 4.0% was attributed to other factors besides waste management. These results reiterated the importance of waste management relative to performance of employees working with NAWASCO.

Table 5: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	43.769	1	43.769	1205.917	.000[b]
	Residual	1.815	50	.036		
	Total	**45.583**	**51**			

a. Dependent Variable: Employee Performance
b. Predictors: (Constant), Waste Management

The results shown in Table 5 reflect the F-statistic ($F_{1,50} = 1205.917$; $p = 0.000$) where it was indicated that there existed a linear relationship between waste management and employee performance given that these results were statistically significant at p-value = 0.05. This implied that the data collected and subsequently analyzed fitted the adopted simple linear regression model ($Y= \beta_0 + \beta_1 X_1 + \varepsilon$). The foregoing led to further analysis to assess the effect of waste management on employee performance where the pertinent results are demonstrated in Table 6.

Table 6: Regression Coefficients

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.161	.121		1.334	.188
	Waste Management	.961	.028	.980	34.726	.000

a. Dependent Variable: Employee Performance

The results shown in Table 6 ($Y= 0.161+ 0.961X_1$) indicated that for employee performance to be increased or decreased by a single unit, waste management had to be changed by 0.961 unit in the same direction while other factors were held constant. In supporting the results shown in

Table 4 ($r^2 = 0.960$), the required change in waste management was almost perfectly fitting in the change effected on employee performance. This underlined the fact that waste management was very importance to the performance of employees. On the same vein, the results of t-statistic ($t = 34.726$; $p = 0.000$) established that the effect of waste management on employee performance was statistically significant at p-value = 0.05. These results led to the rejection of the null hypothesis which stated that the effect of waste management on employee performance was not statistically significant. The findings were in line with Zainudin (2014) who found out that effective waste management have a positive effect on employees performance

Conclusions

According to the study findings, it was concluded that the staff at NAWASCO were seriously engaged in activities and/or tasks on a daily basis to ensure that waste was effectively managed. The company had empowered its staff by availing the pertinent equipment that ensured a safe work environment. The staff were concluded to exhibit elements that were associated with good performance. For instance, they were found to be positively affected by the conductive working environment where the levels of their satisfaction were conspicuously high. The study further made the inference that waste management played a crucial role with regard to performance of employees working NAWASCO. This was supported by the fact that waste management greatly influenced how the aforesaid employees performed their duties. The study recommended that NAWASCO and other water and sanitation or sewerage companies in Kenya should ensure that there is effective waste management as well as highly performance employees. The study further recommend placing of waste collection cans within the organization and Installation of recycling plant for recyclable materials.

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