Wedding and wasting: Exploring food plate waste in Tanzania

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Abstract

Avoiding food waste benefits society, the economy, and the environment. In recent years, major efforts have been made to understand food discarded in the out-of-home eating contexts. However, most of studies have been conducted primarily in developed countries. Although the wedding business is one of the leading producers of out-of-home food, little is known about the amount of food wasted, particularly in emerging markets such as Tanzania. This study was designed to accomplish two goals. First, to examine guests' perspectives of food waste in the wedding market. Second, to analyze factors influencing attendees' decisions to bring food and drinks home from weddings. Convenience and snowballing nonrandom sampling techniques were employed between November and December 2020 to recruit online 121 wedding attendees. The data was cleaned and exported to SPSS-26 for analysis from Google Drive as a spreadsheet file. The study's findings indicate that more than half of guests acknowledge that plate waste at weddings is a serious problem. However, when asked how much food they thought they left uneaten at a recent wedding, more than two-thirds reported leaving less than 10% of the meal served. Unfinished dishes were primarily returned due to the desire to consume everything on the buffet, the late dinner, and the fear of embarrassment. Nearly three-quarters (74%) were willing to bring drinks home rather than food (37%). The binary logistic regression technique identified two significant predictors of food take-home strategy: the presence of a food container and the guest's willingness to pay for wedding expenses. These findings underscore the critical nature of meal planning, packing, and delivery. Additionally, adequate education programs are necessary to raise awareness regarding food waste in the wedding businesses.

Keywords: Plate, food waste, wedding, prevention, Tanzania

JSSBT, Vol. 2 No. 1 (June, 2021), pp. 33 – 41, *© 2021 The Co-operative University of Kenya*

INTRODUCTION

Preventing the amount of food wasted each year is one of the international community's top priorities (Khalid *et al*., 2019). Target 12.3 of the Sustainable Development Goals (SDG) aims to halve by 2030 the amount of food waste at retail and consumer points (Lipinski *et al*., 2016). According to FAO (2019), food waste is defined as "the decrease in the quantity or quality of food resulting from decisions and actions by retailers, food services, and consumers." It is understood that more than one-third of all food produced globally, equivalent to 1.3 billion tons, never reaches the dining table (Gustavsson *et al*., 2011). About 17% of waste occurs in the retail and consumer sectors (UNEP, 2021). Food waste causes more harm to the economy, society, and the environment than expected, representing inefficient utilization of nearly 30% of the global agricultural land area and wastage of more than 25% of freshwater (FAO, 2021). Besides, food waste is a significant source of methane which accounts for 20-30% of the global greenhouse gases (FAO, 2021), and if it were a country, food waste would be ranked third behind China and the USA (Hertwich &

Peters, 2009; Schultz & Mandyck, 2015). Microanalysis shows that households, businesses, and authorities struggle to manage the ever-increasing waste, much of which are food-related (FAO, 2021; Mbuligwe, 2002; Thyberg *et al*., 2015). A rising proportion of hungry people, nearly 700 million and more than half in developing economies, increases the necessity to rescue even a single plate of meal wasted (FAO, 2020b). If only a quarter of the discarded food could be recovered, it would be sufficient to feed the world's hungry (Ocicka & Raźniewska, 2018). China alone, a country home to nearly 20% of the global population and the second-largest economy globally, waste food enough to feed between 30 and 50 million people a year (Wang *et al*., 2017).

Food waste is attributed to consumer actions and behavior in homes and out-of-home settings (Abdelradi, 2018; FAO, 2020a; Goh & Jie, 2019). However, much of the recent out-of-home food waste studies are concentrated on the developed economies (Canali *et al*., 2016, 2016; Eriksson *et al*., 2020; Jörissen *et al*., 2015; Langen *et al*., 2017; Thyberg *et al*., 2015; Wra, 2018). Taken as a whole, literature on food waste in Africa is scarce, scattered, and, if any, limited to a few countries (Cronjé *et al*., 2018; Phasha *et al*., 2020; Sassi *et al*., 2016). Sub-Saharan Africa is still viewed as an epicentre of post-harvest food loss, although it is becoming clear that rapid changes in consumer lifestyles exerted by globalization forces unveil wasting challenges (FAO, 2019).

Wedding is a rapidly and dynamically growing industry worth millions of dollars (Duncan, 2016). For instance, the average U.S. to-be-wed couple spends about $34000, and nearly 30% of the budget is allocated to food (Bieber, 2020). In China, more than 10 million weddings take place each year. How a wedding is celebrated differs by culture, affecting the size, type, and quantity of food served (Farooqi *et al*., 2016; Kaplan, 2013). In most societies, food is central to any wedding function (Flood *et al*., 2014; Parry *et al*., 2015; Pirani & Arafat, 2016; Westling, 1992). To some, food is a social indicator of wealth and prestige, leading to competition among social classes in the production of large volumes and broad ranges of food (Bloch *et al*., 2004; Kaplan, 2013). Furthermore, even inquiring about a visitor's participation at a wedding is considered a clandestine attempt to keep them away, thus, making it difficult to organize meals depending on the number of guests. Thus, to serve anybody arriving at a wedding, food must be prepared in excess, resulting in some not finished up.

However, there is a dearth of literature on food waste in the wedding industry, and if any, it is limited in scope and geographically confined. Specifically, the study focuses on analyzing self-reported plate waste and exploring factors that predict food waste carry-home strategy. To the best of the author's knowledge, this is the first study of its kind in less-explored territory, both geographically and industrially. Study findings will give insight into and provide feedback to businesses and authorities regarding the development and implementation of anti-waste measures in the wedding markets without compromising the customer's value.

METHODS

This exploratory cross-sectional study recruited participants from the author's WhatsApp contact list who identified as recent wedding goers (attended at least one wedding in the last 12 months). The question, "How many wedding parties have you attended over the last 12 months" was perhaps fundamental in justifying the participation in the study. Nearly half (45.5%) of the sample had attended between one and three parties, while one-third (32.2%) had attended three to five parties. First, a convenience sampling strategy was used to choose the first wave of subjects based on their accessibility by posting the questionnaire link with descriptions in the WhatsApp chat groups. Convenience sampling is widely utilized when a researcher needs quick access to data, particularly

quantitative data (Given, 2008; Suen *et al*., 2014). Then, the second wave of data came from the peers elsewhere introduced to the study by the first respondents. This recruitment technique is known as snowballing (Etikan *et al*., 2016). Because group charts are frequently stacked up with text messages and other media, the author felt obligated to publish the questionnaire links as many times as possible. Data gathering took place in November and December 2020, lasting for 30 days.

One hundred twenty-one participants completed and submitted forms electronically into the Google Drive server. The dataset in spreadsheets was then cleaned up and exported to SPSS version 26 for analysis. Eight (8) of the samples were outliers, and they were eliminated from the final analysis, thus reducing the sample size to 113. The chi-square tests were performed to determine the relationship between categorical variables, and the significance level was set at 0.05 (Field, 2017; Rana & Singhal, 2015). Finally, a binary logistic regression technique using the maximum likelihood estimation method was used to predict whether the guest would take home (1) or not take home (0) food and drinks after the wedding (Qi & Roe, 2016). A binary logistic regression is suitable when the dependent variable has only two potential nominal outcomes (Garson, 2016; Peng *et al*., 2002). To avoid confusion, food and drinks were modelled separately, each one as a dichotomous variable with the same set of independent variables.

RESULTS

Participant demographic characteristics

Table 1 shows that the majority (57%) of participants were middle-aged between 31 and 50, and the next largest age category (under 30 years) constituted more than a third (37%) of the sample, while very few (6%) were aged over 50 years. There were more men (55%) than women (45%), and nearly two-thirds (62%) were married, while the rest were single. Four in five participants had a university degree. Across all income levels, close to two-thirds (60%) were earning between Tsh. 500,000 and 1,000,000, and one in five participants (23%) earnings fell between 1,000,000 and 2,000,000, but a handful of participants reported total earnings of more than 2 million shillings per month.

Table 1: Participants' socio-demographics

Characteristic	Freq.	%
Highest education		
Non-university	25	22.1
University	88	77.9
Total	**113**	**100.0**
Age (years)		
Under 30	69	61.1
30 and over	44	38.9
Total	**113**	**100.0**
Gender		
Female	51	45.1
Male	62	54.9
Total	**113**	**100.0**
Income level		
Over 1 million	44	38.9
Less than 1 million	69	61.1
Total	**113**	**100.0**

Food waste awareness among wedding guests

About a fifth (21%) reported attending more than six wedding events in 2020 during the covid19 pandemic. When further required to state whether or not they have ever heard about food waste, nearly two-thirds (63%) reported having no idea about food waste or any ant-waste intervention. Of those who reported being aware of food waste (37%), more than half (56%) were middle-aged, and about one-third (38%) of young participants compared to 7% older people aged above 50 years reported never. Close to half (49.7%) of attendees with university degrees said they had ever heard about food waste, whereas 8% with non-university degree education. Married participants (24%) were aware of food waste than those currently not in marriage (13.2%). However, there were no statistically significant relationships between

food waste awareness and participants' demographic characteristics.

Self-reported and reasons for plate waste

The question of how much food waste occurs at weddings revealed impressive results. More than half (57%) said the plate waste was high, while a third (34%) thought it was modest, and 10% claimed it was almost nonexistent. However, when the question required participants to evaluate how much food they left uneaten on their plate at one of the most recent weddings, over two-thirds (64 percent), reported leaving meagre quantities (less than 10% of meals served). The second-largest group (24%) reported discarding between 10 and 30%, while 12% reported leaving more than one-third of the meal served. Furthermore, when asked to state why this waste, (48%) blamed a broad range of food items displayed on the buffet and about one-third (29%) felt it was due to late service. Some (12%) claimed they were worried about emptying their plate because of the guests sitting next to them, while one in ten said they were concerned about the meal quality (Table 2). The relationship between the level of food wasted and the reasons identified was statistically significant, χ^2=6.051, *p*=.049.

Table 2: Reasons for not finishing food served on wedding guest plate

Reasons	Freq.	%
Quality issues	13	10.7
Late serving	35	28.9
A range of varieties served	58	47.9
Fear of embarrassment	15	12.4
Total	**121**	**100.0**

Factors affecting adoption of carry-home-food and drinks strategy among wedding guests

The survey results revealed that close to three-quarters (74%) of recent wedding attendees were willing to take home some of the served drinks. The model with nine factors was better than the model with the intercept only, χ^2 (9) =24.609, *p*=.003, and explaining 29% of the variation in the willingness to take home drinks following the wedding. Demographic characteristics did not substantially contribute to the model, but three situational factors significantly impacted the taking home decision. Participants concerned about packaging style were five times more likely to pick up their drinks after the ceremony. On the other hand, knowing wedding planners reduced the likelihood of bringing home drinks by a factor of six, whereas sharing wedding expenses increased willingness to bring home drinks by more than tenfold (Table 3).

A hierarchical binary logistic regression strategy was used to model demographic and wedding-related factors to predict willingness to take home meals following the wedding reception (Table 4). Model A was performed on four demographic characteristics (Marital status, Education, Age, and income level). The model was not a good fit based on Omnibus Tests of Model coefficients, χ^2=6.738, *p*=.150, correctly classifying (62%) the outcomes. When situational related factors are added, Model B shows signs of improvement (χ^2 (4) =47.93, *p*=.000), thus increasing the total variation from 7% in Model A to 44% in Model B. Out of nine predictors forced into the model, only two produce a substantial impact on home taking food behavior. Food container being given is the most important predictor in predicting wedding guests to carry home some served meals. When a food container is given, the likelihood of taking home food increases by six times. Wedding cost-sharing increases the chances of taking home food by five times. The effect of these two predictors is statistically significant.

Table 3: Factors affecting drinks-take home behavior among wedding guests

Predictors	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Gender	-.002	.502	.000	1	.997	.998	.373	2.670
Income level	-.194	.534	.131	1	.717	.824	.289	2.349
Education qualification	-.418	.613	.466	1	.495	.658	.198	2.187
Marital status	.175	.531	.109	1	.741	1.192	.421	3.371
Packaging concern	1.678	.654	6.594	1	.010	5.357	1.488	19.288
Carry at night	1.860	1.339	1.928	1	.165	6.423	.465	88.701
Carry but have enough to eat	-1.200	1.101	1.187	1	.276	.301	.035	2.608
Shared -wedding expenses	2.422	1.109	4.764	1	.029	11.264	1.280	99.103
Organizers familiar	-1.828	.766	5.694	1	.017	.161	.036	.721
Constant	.523	.944	.307	1	.579	1.688		

Table 4: Hierarchical logistic regression analysis on the factors affecting the adoption of take-home meals

Predictors in the model	**Model A**						**Model B**					
	B	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**Exp(B)**
Marital status				1		1.1		0.61		1	.646	1.3
	0.11	0.47	0.06		.813		0.28		0.21			
Education				1	.985	1.0		0.59		1	.541	1.4
	0.01	0.47	0.37				0.36		0.37			
Age	-1.01			1	.041	0.4	-	0.64		1		0.3
		0.49	4.19				1.12		3.01		.083	
Income level	-0.11			1		0.9		0.52		1	.419	1.5
		0.41	0.07		.797		0.42		0.65			
Shared wedding cost								0.74		1	.031	4.9
							1.60		4.64			
Known to the weds-to-be							-	0.61		1	.973	1.0
							0.02		0.00			
Food container given								0.51		1	.000	6.1
							1.82		12.54			
Carry at night								0.9		1	.212	3.1
							1.12		1.56			
Carry but have enough to eat							-	0.78		1	.544	0.6
							0.47		0.37			
Constant				**1**		**1.6**	**-**	**0.54**		**1**	**.015**	**0.3**
	0.49	**0.36**	**1.83**		**.177**		**1.32**		**5.87**			
Model statistics	R^2=0.072, Correct classification= 62%, Omnibus Tests of Model Coefficients is insignificant (p=.150)						R^2=0.437, Correct % classification=74%, Omnibus Tests of Model Coefficients is significant, (p=.000)					

DISCUSSION

Weddings are recognized for the lavish food spending, which provides an opportunity to learn more about the guests' general knowledge of food waste. The vast majority of respondents in this study had a poor understanding of food waste and the incentives for reducing it. These findings appear to be in line with earlier research (Frankovic *et al*., 2019; Goodman-Smith, 2018), particularly those that looked at out-of-home waste in developed consumer societies. The current findings on wedding waste awareness are likely unique in that they cover areas of food waste that have received less attention. Therefore, these findings are crucial in developing strategies and policies to increase consumer awareness and

incentive to prevent food waste in developing countries like Tanzania.

Weddings, according to many participants, are a source of food waste. Their self-assessment, on the other hand, does not reflect the severity of the problem. This is most likely what past research have found, validating guests' inclination to exhibit falsely socially acceptable behavior (Delley & Brunner, 2018; Werf *et al*., 2019). Although self-estimation is not the most accurate method for determining the extent of food waste, it is crucial not to ignore it because it is the only way to provide a picture of wastage in studies involving large samples. Alternative ways of assessing food waste in the wedding industry, such as weighing, may be utilized to obtain reliable results.

This study also shows that most visitors are willing to carry drinks (74%) rather than food (37%). These findings provide a unique glimpse into drinks as opposed to previous studies, many of which focused on carrying only food scraps (Giaccherini *et al*., 2021). This is probably a new perspective that demonstrates that weddings as social events tend to be defined based on social-cultural settings in which events take place. However, carrying drinks can also be a common practice, as most people do so even in everyday life, whereas food is expected to be eaten in a particular environment. However, this study does not specify what drinks patrons are willing to carry home, and probably there is room for more understanding of the type of drinks that can be taken home to aid the planning. For example, it might be that guests are ashamed of taking home the food served, considering this an indicator of financial difficulties, similar to recent findings (Giaccherini *et al*., 2021; Hamerman *et al*., 2018; Stöckli *et al*., 2018).

On the other hand, findings show that when organizers or food caterers supply food containers, the likelihood of collecting home food served is high. These results confirm the recent results by Giaccherini *et al*. (2021), which showed that many customers are not ready to request a doggy bag for carrying food, but when supplied, the chances of acceptance are high. This is likely to respond significantly if this policy is adequately framed for guests, event organizers, and food caterers. However, further studies on food and beverage packaging are needed to identify the best and most attractive way for guests to carry food and drinks as the best way to reduce the rate of leftovers.

Making a financial contribution toward the wedding's expenses appears to increase the motivation of guests to take food and beverages home following the reception. This kind of funding tends to be enormous and personalized, unlike restaurants' typical purchase of food services (Hamerman *et al*., 2018; Wang *et al*., 2017). In an event where the participation of a guest is justified by the contributions made (Gikuri, 2017), it is probably worthwhile to go to any length to rescue the amount of food deemed necessary in return for the assistance provided. There is no guarantee that food taken from a wedding will be entirely eaten up (Hamerman *et al*., 2018). However, in an environment where the participant has other people living in the house, the probability of food being spoiling may be minimal because, in some social settings, wedding food is often considered to be of high quality compared to what is cooked at home all the time.

Study limitation: This study used a small sample of online WhatsApp users and may have missed valuable insights for not involving physical samples. While treating this sample as representative of the population may be inappropriate, it is sufficient to appreciate the findings for future development and modification of similar studies, as this may be one of the few of its kind in food waste. Additionally, such studies are probably worthwhile, as the field of food waste is expanding and requires understanding from a variety of perspectives.

CONCLUSION & RECOMMENDATIONS

The primary objective of this exploratory cross-sectional study was to determine the

level of food waste in the wedding industry and the factors that influence guests' decisions to take food and drinks home. Guests preferred to take drinks home rather than food. Giving guests containers was one of the most effective ways to encourage food waste prevention. Guests who contributed financially to the wedding budget are more likely to take food home after the wedding. While encouraging wedding guests to take home a portion of their meal or drinks may be successful given that more education campaigns are implemented, it is not easy to guarantee that the food taken will be consumed rather than thrown away. The government should also enact and enforce laws requiring wedding planners and organizers to minimize leftovers.

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