

## WORLDWIDE FOOD WASTE IN MUSLIM MARRIAGE CEREMONIES: A CASE STUDY CONDUCTED IN KARACHI, A MEGA CITY OF 23.5 MILLION, AND CITY OF DIVERSE MUSLIM COMMUNITIES

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### ABSTRACT

*Based on findings in Karachi, a mega case study city of diverse Muslim communities where averagely a person wastes 475 g food in marriages which is more than the average food consumed per meal at home. The diversity of Muslims in Karachi is like a rainbow of all colors and many ethnicities. The study stipulated that cumulatively worldwide Muslims waste 26.81 million tons food in marriage ceremonies. This colossal food waste will offset hunger of 184.81 million, 92.40 million, and 20.53 million people with one, two, and three meals per day. To offset hunger with three meals daily the entire population of Somalia and Haiti can benefit from worldwide saved food in Muslim marriages. Food waste inefficiencies and consumption behavior in different age groups and genders revealed inefficiencies in food consumption behavior. Main food waste causes during marriages entailed very late serving, inappropriate food combination, guest's perception about food shortage, large per unit food portions, and scrambling of food tables. Food waste inadequacies and consumption behavior in different age groups and genders revealed inefficiencies in food consumption behavior. Good science indicates the rise in obesity and diabetes amongst Muslims in South Asia and Middle East are linked to the consumption of super-rich caloric food, notoriously sugary sweets/desserts with inactive cultural habit of exercise/walk is a recipe for obesity/diabetes. Since the present cultural norms of food waste have taken hundreds of years, it will require paradigm shift to inculcate the basic Muslim faith of eating modestly, refraining from lavish eating, and slicing down food portions/sweets to avoid obesity. The savings in food waste will offset hunger and allow obligatory fulfillment of basic human rights and obligatory fulfillment of the right of education for both genders in Islam. Proposed action plan to overcome food waste include use of OIC and IDB platform for collection/distribution, all Muslims to halve their expenditure on wedding receptions to contribute the remaining half for marriages amongst poor communities and developing awareness message with invitations; hoarding of public message along food tables to encourage self consciousness from undue food waste and saving waste.*

Key words: Marriage Ceremonies, Saving Food Waste, Offsetting Hunger, Paradigm Shift, Action Plan for Saving Food Waste

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### 1. Introduction

#### 1.1 Background

The worldwide Muslim population generally floating amongst Muslims hover between 1.6 and 1.7 billion (Eshai, 2015; The Intellect Bulletin, 2014, and Muslim Population, 2015) whereas Western sources contend Muslim population to be about 2.06 billion and 2.01 worldwide Christians out of total average world population of 7.22 billion (World Muslim Population, 2015, and Religious Population, 2015). The annual growth rate of Muslims and Christians estimated at 1.84% and 1.32 % respectively (World Population, 2015; US Census, 2015, and World Muslim Population, 2015). This lead us to understand that today one out of every four person in the world is a Muslim.

Karachi the largest city of 23.5 million in Pakistan is teeming with 68 percent youth (The Express Tribune, 2015) out of total 191 million people (Pakistan's Population A, B, and C, 2015) is extrapolated to contain 16 million youth. It was ironic that food wastes during marriage ceremonies in Karachi are ubiquitously seen in all the segments of society. Anthropologists contend Karachi as the melting pot of all Muslim cultures in Pakistan. On the contrary hunger can be substantially overcome in Pakistan and among Muslims in general by taking appropriate preventive measures to eliminate food waste during marriages. Karachi is the melting pot of all Muslim colors, many ethnicities, and diverse sects living in Asia. The city is like a rainbow of Muslim diversity representing all colors, sects, and most ethnicities and is also like all colored and shades of jewels emanating from many water bodies most meticulously and beautifully laid. Karachi is the commercial capital and largest mega city of Pakistan.

The country is bordered on north and east with the two most populous countries in the world. The city is mainly comprised of Muslim migrants from Afghanistan, Africa, Arabs, China, India and internal rural-urban migrants from Baluchistan, Kashmir, Punjab and Sindh. Presently Karachi boasts as hosting largest conglomeration of Muslim Pushtoons in the World. In addition, Karachi also hosts minority of Muslims migrants from non-traditional countries/ethnicity like Central Asian Republics and more than dozen countries ranging from Armenia, Brits, Dutch, Portuguese, Somalis, and Turks etc. including splashes of Non-Muslim religions such as Ahmadies, Christians, Hinduism, Judaism, and Zoroastrians (<https://en.wikipedia.org/wiki/Karachi>: accessed Aug.8,2016)

Though worldwide the United Nations Millennium Development Goal (UNMDG) Goal Number 1 'Eradication of Poverty' extreme poverty has been halved but Pakistan has not made dent in its reduction. Translating the World Bank estimates in regard to Pakistan's where 60% population i.e., about 115 million live below poverty line sleep hungry. Sadly on the regional scale, the poverty is significantly lower than Pakistan. This is because independent observers contend that Pakistan's poverty eradication initiatives such as Benazir Income Support Program, Pakistan Poverty Alleviation Fund, Tameer Watan Program, Pakistan Bait-ul Maal, Employees Old Age Benefit Scheme, Workers Welfare Fund, and Subsidy on Food have benefitted a small percentage of the population, the progress on poverty eradication in Pakistan has been disappointing (Ali, 2015).

Control on food waste or saving food in marriage ceremonies can substantially overcome poverty. In this study the food is considered waste in between cooking and serving/eating in marriages/social functions. It is painful to see excessive food waste in both developed and underdeveloped countries such as Pakistan where control on food waste in marriage ceremonies can substantially offset hunger in Karachi. Though food waste studies have been conducted in India, UK, China, Korea, Japan and Malaysia, statistics on food waste during wedding ceremonies has been extremely limited. Holy Quran 6:141 says 'Do not waste, for Allah does not love the wasteful'. (The Noble Quran, 1985) Controlling food waste in general and marriage ceremonies in particular is though chronic social issue; it requires intrinsic understanding of the problem. Muslim marriage in Pakistan is contracted by offer and acceptance in the presence of witnesses. Culturally, it is a link between the husband and wife and an alliance between two families. Islamic marriage laws are claimed to be followed in Pakistan because about 97% population is Muslim. However during marriage ceremonies conglomeration of various customs and traditions including a blend of Islamic and non-Islamic traditions are widely observed all over the world amongst Muslims. Though Islamic marriage is a legal obligation, Muslims generally do not follow religion during marriage ceremonies and instead most marriage traditions are drawn from other cultures such as Hinduism in Pakistan. Apropos, the objectives of the present study were:

- a. To understand current food wastage in wedding ceremonies amongst Muslims in Karachi and worldwide
- b. To suggest measure to mitigate food loses during marriage and social functions, and
- c. To suggest efficient and effective utilization of food

## 2. Food Waste

Food waste is not only the Muslim's issue but a global issue of mankind. Food Waste refers to the ultimate loss of edible food destined for human consumption. The food loss occurs at all the stages from farm to table. In developed countries most food waste is at consumption stage whereas in developing countries the most loss is during supply chain. The FAO (Food and Agricultural Organization) estimates that globally one third (approximately 1.3 billion tons per year) food produced for human gets wasted out of which total food waste in UK, Sub-Saharan Africa and Worldwide are of the order of 8.3, 230, and 1300 million tons per annum respectively. Karachi being the mega city of Pakistan is the largest city in the Muslim world, and third-largest in the world has population density of over 24,000 people per square kilometer (63,000 per square mile). Karachi's middle class constitutes 55% (13 million) whereas the remainder 25% (5.8 million) and 20% (4.7 million) fall in upper and lower class (Dawn News, 2012 and Durr-e-Nayab, 2010).

Holy Quran 7:31 states, "And Eat and drink, but not by extravagance (excessive). Indeed, He (Allah) likes not those who waste by extravagance, or by committing excess (The Noble Quran, 1985)." A Hadith in Tirmizi further advises Muslims to leave "one third of the belly with food, another third with drink and leave one third empty for easy breathing"

### 2.1 Excesses Food Consumption is a growing World Muslim's Problem

Worldwide nearly two billion people in the age group of 15 and over are overweight i.e., obese. It will be surprising to know that obesity is more than twice as many underweight people in the world. Obesity substantially increases risk of diabetes, hypertension, heart attack, stroke, osteoarthritis, gall bladder disease, respiratory complications, and some cancer (Cunningham and Cunningham, 2015, and Gustavsson et al., 2013). Obesity prevalence amongst Muslims will at least be the same if not more though increasing trends are clearly visible in many affluent Muslims countries can be attributed to increased consumption of energy rich oily and sugary foods and lack of exercise. Eating excess food than our bodies needs could be considered a form of food waste. Consequently eating excessively should not mean that one becomes food disposal basket degrading himself/herself into obese. Though food dumping in stomach is a food waste in itself, it directly leads to sicknesses/diseases and preclude to many diseases.

### 2.3 Recycling Of Food Waste and Composting

In Karachi recycling waste food i.e. leftovers on food table, unconsumed food in plates, excess cooked food remained un-served in mega cooking utensils etc., is generally carried out under the carpet that will require separate study. However, all unhygienic leftover food can be converted into organic fertilizers by composting. Organic material's decomposition is permeated in containers/dug holes where naturally occurring micro-organisms such as bacteria, fungi, small invertebrates, such as earthworms and millipedes help to complete the decomposition process. Composting converts organic waste into rich, dark colored compost/humus, in a few weeks/months under controlled conditions and has many benefits (Adhikari, 2005)

### 3. Material and Methods

#### 3.1 Data Collection, Hypothesis, and Statistical Analysis:

The consumable leftover food destined to be thrown away as garbage /waste food i.e., leftover food contained in Plates and, Dishes, Polythene Bags were collected and weighed using Digital Balance. The study spanned over 35 families (7 families in each of the five Karachi's districts namely North, South, East, West & Central) comprising of 192 persons. The observations included all left-over meat/beef/fish pieces that were initially placed in large garbage bags destined to be picked up before final disposal to dustbin as a valued item to be used/sold to various cheap local restaurants. Additionally the net weight of individual invitee's leftover food was measured by weighing and deducting the dry/empty dishes and plastic/garbage bags weights. Statistical computation (T-Test table 4 and ANOVA Table 9 and Figure 5) to determine gender wise food consumption/left over were carried out by considering following two hypotheses:

**H<sub>0</sub>:** Average food consumption of male in wedding ceremonies = Average food consumption of female in wedding ceremonies

**H<sub>1</sub>:** Average food consumption of male in wedding ceremonies  $\neq$  Average food consumption of female in wedding ceremonies

#### 3.2 Snapshot of Major Food Waste Causes:

This was studied by randomly asking carefully drafted questions in which guests were asked to comment on other's behavior rather than the guests who volunteered to respond.

#### 3.3 Wedding Halls in Karachi

Karachi where statistics of registered Wedding Halls was not available for variety of reasons, the data of all registered/unregistered functional Wedding Hall was arduously collected.

#### 3.4 Solemnization of Marriages in Karachi

The marriage statistics for Karachi indicated that zero or no marriage was solemnized in the month of Moharram. However, keeping in view the worldwide Muslims being Sunni (Islamic Research Foundation, 2015 and Islamic Web, 2015) and increasing trend of intermarriages between Sunni and Shia in non-Muslim countries the 11 months data was used to extrapolate 12th. Month's data in Karachi's statistics. Generally the ten days of Moharram is avoided for marriages but outpaced in remaining days. It may be interesting to note that Sunni and Shia intermarriages are more common than Catholics and Protestants equivalent in Christianity.

#### 3.5 Limitations of the Study

This being first exploratory research, attempt has been made to assess Food Waste Behavior during Marriages in Karachi. As we know, Karachi as the mega city Pakistan is a melting pot of all cultures and rightly called 'Little Pakistan' and invariability considered as 'Mecca of Diversity' where people of all socioeconomic, religious, cultural, minorities and regional background reside. Moreover, the city has massively benefited due to its being economic hub/commercial capital /port city of Pakistan, and where the living standards of the hard working people have gone up. Consequently, the number and size of social gatherings has increased, consequently it was difficult to quantify food wastes in social gatherings/functions, other than marriages. Apropos, the study had following limitations:

- a. Difficulty in accurately quantifying food wastage in marriage ceremonies
- b. Stakeholders hesitant to reveal facts
- c. Limited previous studies on food wastage during wedding ceremonies
- d. Majority of Weddings Halls are unregistered and therefore owners and knowledgeable people were extremely discrete about revealing the information for well known reasons.

### 4. Results and Discussion

#### 4.1 Marriage Halls in Karachi

The Zone-wise data on Marriage Halls and its corresponding capacity indicated that a total of 5000 Main Wedding Halls exist in Karachi (Table 1). This figure excludes the tents pitched outside or inside residence or in vacant neighboring plots for marriage functions.

**Table 1 Number of Marriage Halls in Karachi**

Zones	Main Halls Marriage (No.)	Average No. of Sub Halls (No.)	Total Marriage Halls (No.)
East	550	2	1100
West	300	2	600
South	350	2	700
North	850	2	1700
Central	450	2	900
<b>Total</b>	<b>2500</b>	<b>2</b>	<b>5000</b>

#### 4.2 Solemnization of Marriages

The record of the Wedding Halls (Table 2) that no marriage was solemnized in the month of Moharram in Karachi. Extrapolating on worldwide wise data, out of 23.5 million Karachi's population 47.3 million Muslim marriages were solemnized worldwide. Assuming two receptions per marriage (Table 2) the percent of marriages comes to around 2.3% of the Muslims around the world.

**Table 2 Statistics of Marriages Statistics in Respect To Islamic Months**

Statistics Of Marriages With Respect To Islamic Months			
S.No	Islamic Months	Lunar Months	Total Marriages
1.	RABI UL THANI	JANUARY-2013	99000
2.	JUMADA AWWAL	FEBURARY-2013	79200
3.	JUMADA US THANI	MARCH-2013	69300
4.	RAJAB	APRIL-2013	49500
5.	SHABAN	MAY-2013	39600
6.	RAMADAN	JUNE-2013	19800
7.	SHAWAL	JULY-2013	217800
8.	ZUL-QAADAH	AUGUST-2013	79200
9.	ZUL-HIJJAH	SEPTEMBER-2013	217800
10.	MOHARRAM	OCTOBER-2014	90,000
11.	SAFAR	NOVEMBER-2014	19800
12.	RABI UL AWWAL	DECEMBER-2014	99000
<b>Total Marriages in a year</b>			<b>1080,000</b>

Figure 1 Marriage Statistics With Respect To Hijra Calendar-Bar Diagram

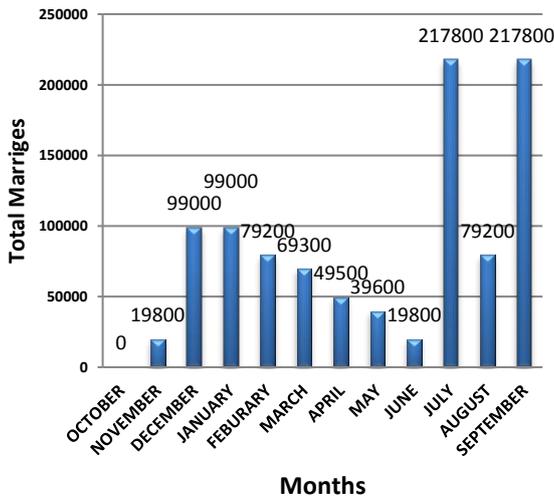


Figure 2 Marriage Statistics With Respect To Hijra Calendar-Pie Chart

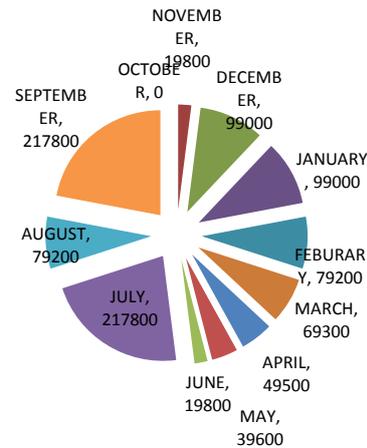


Figure 3 Marriage Statistics With Respect To Islamic Calendar-Bar Diagram

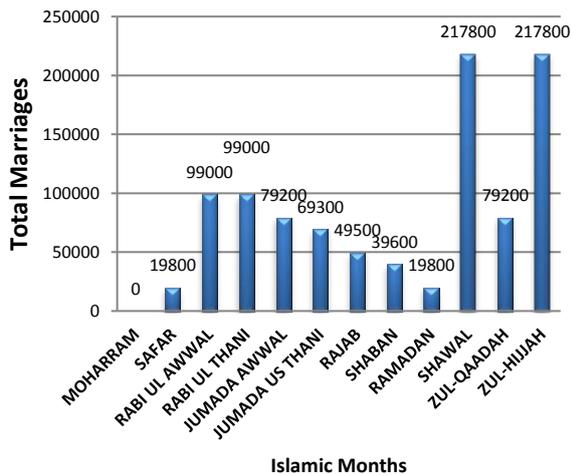
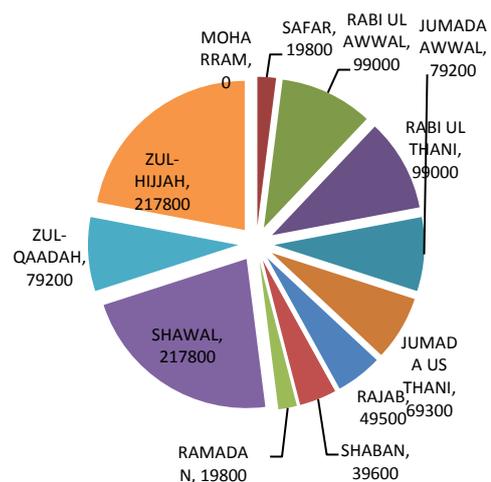


Figure 4 Marriage Statistics With Respect To Islamic Calendar-Pie Chart



### 4.3 Snapshot of Food Waste Behavior in Wedding Reception

Snapshot of the major food waste causes investigated during wedding reception and social gathering:

- Late Serving:** Most often food is served very late in wedding receptions in Karachi; unlike the rest of Pakistan food is served past mid-night or at times at dawn well into the next day. Normally the guests come without super and they tend to get exceedingly hungry and in the process collect excessive amount of food than their normal capacity. This often led to leaving about half or more food in plates as waste. Those who attend wedding reception first time in Karachi visiting from elsewhere in Pakistan get their shocking experience of late eating.
- Guests Unawareness regarding Food Waste:** Most guests in wedding/social functions all over Pakistan gather large quantities of food than they could possibly consume which is apparently considered as normal
- Inappropriate Food Combination:** For example too many (meat/beef/vegetable source curries, deep-fried chicken/fish, 'biryani' (rice with meat/chicken made in Pakistani style), sweet dish (normally more than two), sweet soda drinks of famous makes; during summer-Kulfi (local ice-cream); winter- Halva. Often-sugar loaded Pakistani sweets are served in addition. Most often wedding reception is preceded by two or more starters (common starters served in wedding reception: Samosa, Halva, deep-fried chicken/fish pieces/ Pakora made with garbanzo beans powder mixed with vegetables/onions and powdery condiments mixed in water duly battered and deep fried in small portions).
- Scrambling Around Food Tables:** To avoid long queues/waiting time, guests take large food portions in their plates. Scrambling of guests around food tables often results in guests collecting large quantities of food irrespective of the personal likeness keeping aside Muslim's values of collecting food in eatable portions.

The average food consumed and wasted in marriage ceremonies are tabulated in Table 3 and Figures 5 to 8.

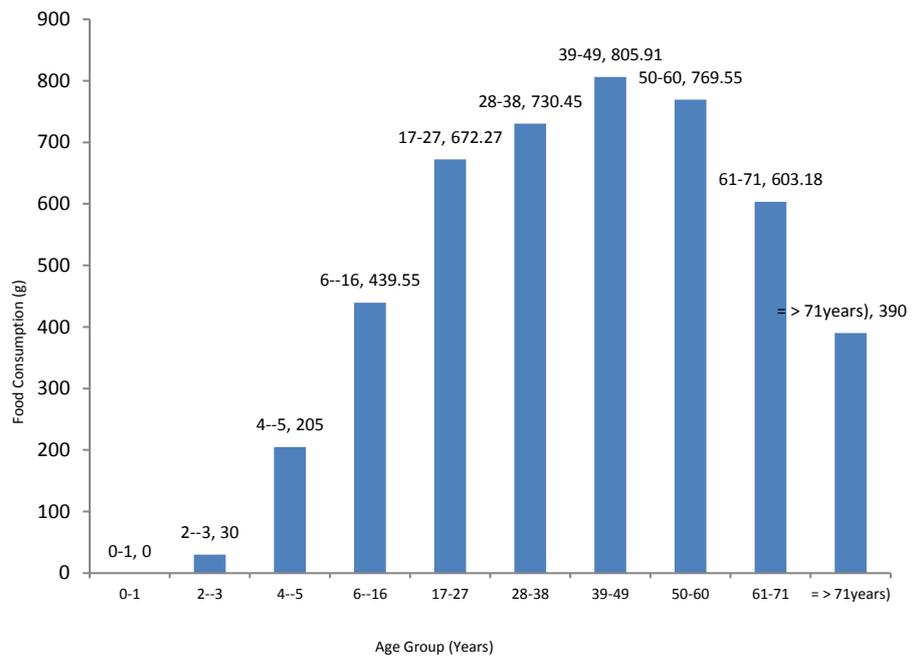
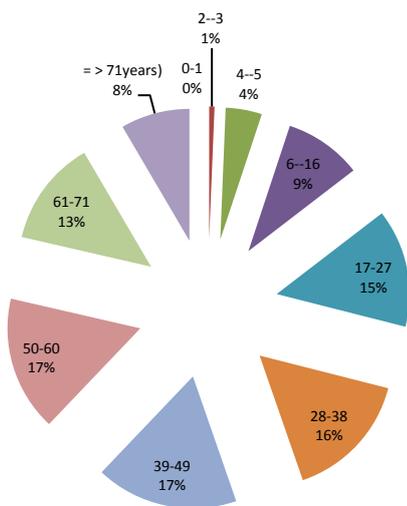
**Table 3 Consolidated food waste proportions during wedding ceremonies**

Family Members	Ages (Year)	Total waste (g)	Total Eaten (g)
<b>Ceremony I</b>			
Father	51	490	1125
Mother	42	485	810
Son	17	485	850
Daughter A	19	430	540
Daughter B	15	410	550
<b>Ceremony II</b>			
Father	55	860	1090
Mother	46	475	955
Son A	12	350	540
Son B	20	365	1025
Daughter A	15	320	570
Daughter B	18	400	640
<b>Ceremony III</b>			
Father	58	560	1335
Mother	49	415	945
Son A	25	810	625
Daughter	19	410	530
Son B	16	475	455
Grand Father	83	540	445
Grand Mother	76	335	480
<b>Average</b>		<b>475.00</b>	<b>738.95</b>

The data on average food consumption in wedding (g/person) are reported in figure 3 and 4 presented as follows:

Figure 5 Food Consumption in Wedding Ceremonies (g/person-Female)-Pie Chart

Figure 6 Food Consumption in Wedding Ceremonies (g/person-Female)-Bar Diagram



Female (g/person)

Age Group (Years)

Figure 7 Food Consumption in Wedding Ceremo

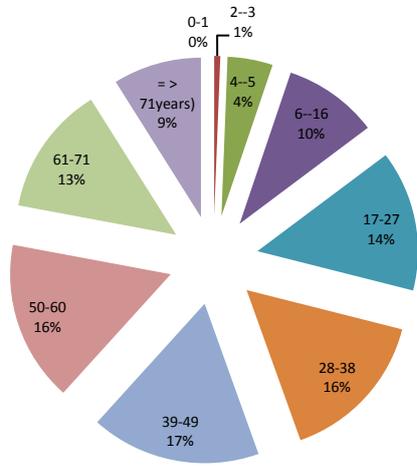
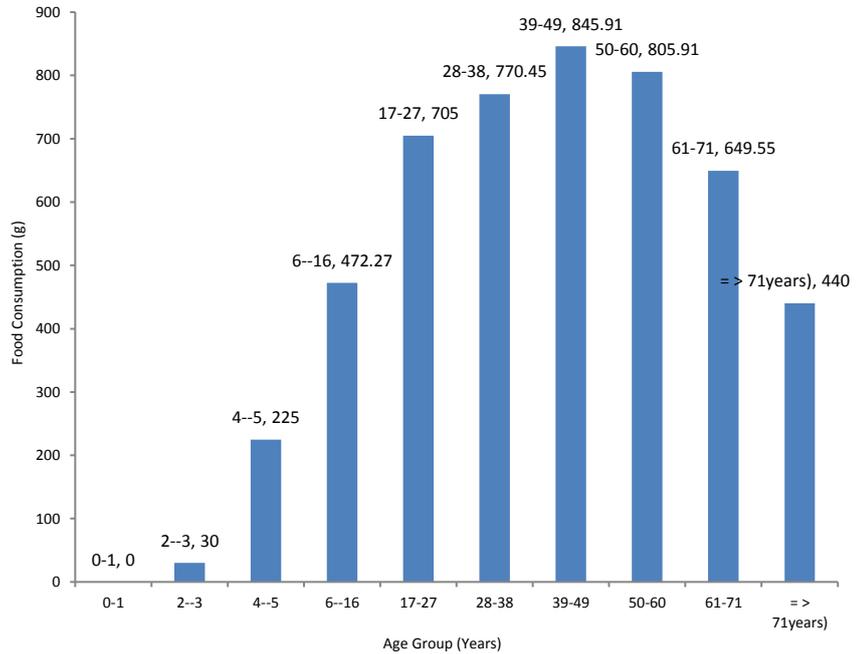


Figure 8 Food Consumption in Wedding Ceremonies (g/person-Male)-Bar Diagram



The statistical analysis of the male and female food consumption indicated that, male consumes more food than females in wedding ceremonies (Figure 5 to 8). The reason for female eating less food is mainly because females own responsibility for feeding children and traditionally females eat after males. In addition, during wedding the women generally are involved in socializing that includes match making.

4.4 Statistical Computation

4.4.1 T-Test of Food Consumption in Wedding Ceremonies

T-Test on average food consumption in wedding ceremonies is reported in Table 4 presented as follows:

Table 4 T-Test of Food Consumption in Wedding Ceremonies

Paired Samples Test								
Pair 1 Male - Female	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
	29.81800	17.71047	5.60054	17.14869	42.48731	5.324	9	.00045

H<sub>0</sub>: Average food consumption of male in wedding ceremonies = Average food consumption of female in wedding ceremonies

H<sub>1</sub>: Average food consumption of male in wedding ceremonies ≠ Average food consumption of female in wedding ceremonies

Rejecting H<sub>0</sub> that the Average consumption of food in wedding ceremonies of male and female is not equal

4.4.2 ANOVA-Test of Food Consumption in Wedding Ceremonies

The ANOVA-test analysis based on food waste against families in marriage ceremonies reported in Table 5 and Figures 9 to 12

Table 5 ANOVA-Test of Food Wastage in Wedding Ceremonies (Three families shown in Table 3)

ANOVA ( Major Dish 'Qoorma' Waste)					
	Sum of Squares	df	Mean Square	F	Sig.

<b>Between Groups</b>	3701.230	2	1850.615	3.042	.078
<b>Within Groups</b>	9126.548	15	608.437		
<b>Total</b>	12827.778	17			
<b>ANOVA ( Major Dish 'Broast' waste)</b>					
<b>Between Groups</b>	8218.254	2	4109.127	.844	.449
<b>Within Groups</b>	73026.190	15	4868.413		
<b>Total</b>	81244.444	17			
<b>ANOVA (Major Dish 'Biryani' waste)</b>					
<b>Between Groups</b>	5497.063	2	2748.532	.558	.584
<b>Within Groups</b>	73843.214	15	4922.881		
<b>Total</b>	79340.278	17			
<b>ANOVA ( Minor Dish 'Desserts' waste)</b>					
<b>Between Groups</b>	5556.111	2	2778.056	2.265	.138
<b>Within Groups</b>	18400.833	15	1226.722		
<b>Total</b>	23956.944	17			

Figure 9 'Broast' Waste Against Families

Figure 10 'Biryani' Waste Against Families

Figures 9-12 showing the ANOVA-test result of food waste against families in wedding ceremonies

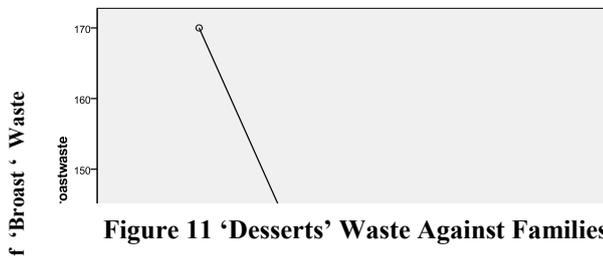


Figure 11 'Desserts' Waste Against Families

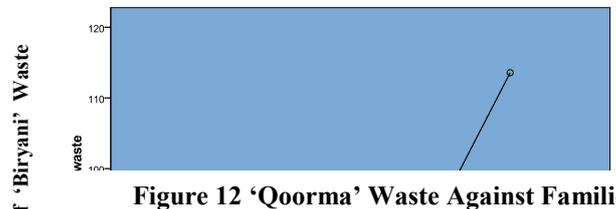
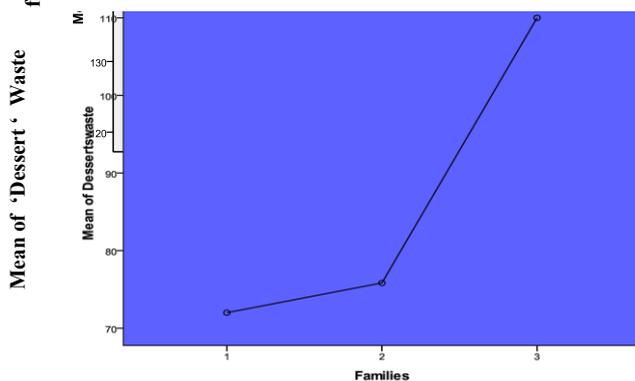
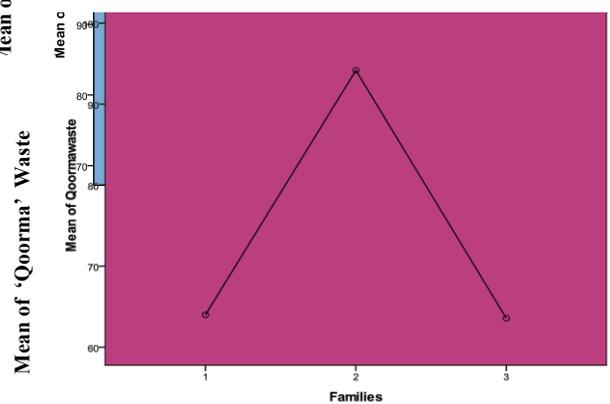


Figure 12 'Qoorma' Waste Against Families



#### 4.4.3 Statistical Conclusions

According to the analysis of variance (Table 5 and Figure 5-8) the significance value  $P$  greater than the level of significance  $\alpha$  which means that we don't reject null hypothesis and conclude that there is no significant difference in the wastage of desserts in the wedding ceremony of the three families.

#### 4.5 Food Waste Computation Methods during Marriage Ceremonies in Karachi

Two methods of food waste calculation were used.

**Method A**

Average food waste in wedding ceremonies = **475 g/person/occasion** (Table 3)  
 Average total guest invited per marriage ceremonies = **300** (Data obtained from wedding halls)  
 Total number of receptions per marriage = **2** (not taking into account increasing trend that marriage ceremonies comprise of additional traditional parties such as ‘Mehndi’ Hena dyeing and Mayo, tradition of bride’s isolation from males).  
 Total marriage Halls in Karachi (Approx) = **5000** (Each main hall is comprises of at least two sub halls of 300 capacity each, Table 1)  
 Total marriage ceremonies per month per wedding hall in Karachi = **18 / month** (This data is based on information provided by hall owners)  
 Total month for marriages (Approx) = **12** (Table 2)  
 Total food waste generated during marriage ceremonies in Karachi (Approx) = **307,800 tons per year**

**Method B**

Average food waste in wedding ceremonies = **475 g/person/occasion** (Table 3)  
 Number of marriages in 2014 = **1080,000** (Table 2)  
 Average total guest invited per marriage ceremonies = **300** (Data obtained from wedding halls)  
 Total number of receptions per marriage = **2** (not taking into account increasing trend the marriage ceremonies comprise of additional traditional parties ‘Mehndi’ Hena dyeing and Mayo, tradition of bride’s isolation from males but in this present calculation these extra parties have been excluded).  
 Total food waste generated during marriage ceremonies in Karachi (Approx) = **307,800 tons per year**  
 Both the above mentioned methods provided same result.

**4.6 Offsetting Hunger by Saving Waste Food Generated During Wedding Ceremonies**

Daily consumption of food (Approx) = **1.2 Kg/person** (This information is collected from different study)  
 Average food consumption per meal = **400 g/person**  
 Table 6 provides the details of offsetting of hunger by providing 1, 2 and 3 meals / day

**Table 6 Offsetting hunger with waste food saved in Muslim marriage ceremonies**

Waste food savings in marriage ceremonies	Waste food saved per year	Offsetting hunger per person per day at rate 400g per meal bases annually		
		One meal daily	Two meal daily	Three meal daily
(Specify)	(Thousand tons)	(Number of persons in millions)		
<b>Karachi (23.5 Million population)</b>	<b>282</b>	<b>1.93</b>	<b>0.96</b>	<b>0.64</b>
<b>Worldwide Muslims (2.06 Billion)</b>	<b>26,982</b>	<b>184.81</b>	<b>92.40</b>	<b>20.53</b>

Table 6 stipulated that food waste in marriages if saved as clean and healthy food, it will offset hunger amongst 184.81 million people comprising of total population of Ethiopia, Sudan, Niger, Chad and Somalia with provision of one meal daily for the whole year. With provision of two meals per day per year basis 92.4 million people of the entire population of Afghanistan, Mali, Benin, Somalia, and Burundi will fully benefit. However, in case three meals daily were to be served then entire population of Somalia and Haiti equivalent to 20.5 million people can benefit from the saved food in Muslim marriages worldwide (Countrywide Population, 2015). Additional similar studies in one country each in the Africa, Middle East, Europe, and Americas will enrich authenticity and reliability of the results.

**4.7 Action Plan on Saving Food Waste during Marriage Ceremonies**

Based on the food waste observations during marriage ceremonies in Karachi, action plan to control food waste is proposed in Table 7. The action plan entails action topics, service-to-society message, and objective. The action plan will induce paradigm shift in our eating behavior and self awareness on food waste. In addition, Muslims to seriously consider on reducing their cultural per unit size of oil fried eateries such as ‘Samosa’, ‘Paties’, ‘Kebabs’ etc. and sweets into tins bits or mini sizes so collect in plates only the quantity that can be fully consumed and keep the remainder saved in serving plates.

**Table 7: Action Plan on Food Waste during Wedding Ceremonies**

ACTION TOPIC	SERVICE-TO-SOCIETY MESSAGE	ACHIEVEMENT (Objective to be achieved)
Waste no food. Inculcate think-while-you eat motto of life 'You eat to live and not live to eat'	Save clean and healthy food for the hungry in society	1. Waste no food. 2. Save food for 76 million hungry in Pakistan
Think-while-you-eat (General)	1. Eat not that will make you sick 2. Take small eatable healthy food portions. It will give opportunity to take food which that you love to eat 3. Save healthy food for millions sleeping hungry	Save would be waste food for the poor
Think-while-you eat (during reception)	1. Eat healthy portions to stay healthy 2. Over eating leads to obesity, diabetes, cardio vascular and other life threatening diseases	Save yourself from overeating illnesses-avoid becoming part of millions suffering from obesity and other over-eating related diseases worldwide
Think-while-you eat (wedding ceremonies)	1. Take consumable healthy portions in serving plate 2. Ensure maintaining hygiene on food table 3. Avoid becoming sick/obese by over eating 4. Act individually to eat healthy food servings while leaving unspoiled healthy food for others	1. Waste no food 2. Act individually from over-eating food related illnesses such as obesity/ diabetes just to name a few 3. Save excess food healthy/clean for poor. Globally 1.3 billion tons of food or one-third food produced is lost/wasted annually. Think of 80 million Pakistanis living in abject poverty

#### 4.8 A Polite, Humble and Inspirational Message For Saving Food From getting Waste a Service-To –Society

It is strongly believed that inculcating self consciousness regarding food waste such as inspirational messages printed on invitation card and hoarding of messages along food tables developed herein under will make paradigm shift in food eating habits and saving food for the needy.

#### 4.9 An Important Service-To-Society Poster Message in Wedding Reception

A polite, humble and inspirational message for saving food from waste as a service-to-society

All the distinguished guests are respectfully informed that there will be plentiful food for guests. However, at times a large part of the food will either be getting ready, under preparation, and on its way for serving distinguished guests as fresh, clean, and healthy food. In Islam, eating less holds great health and spiritual benefits while excessive eating is not condoned and instead leaving some space in stomach is advised to maintain good health. Health is one of the most magnificent Grace of Allah. As a part of religious Islamic duty, we all need to remind ourselves that taking food in eatable (consumable) portions will leave no leftover food in serving dishes for throwing away as garbage. As a service-to-society message and being part of the great cherished Islamic religion, it is our moral obligation to think of about 76 million people in Pakistan and billion worldwide who sleep empty stomach. All food which will be left as clean, healthy, and safe food from this reception will be respectfully served to those in need.

Billion thanks on behalf of billions, for favor of kind attention

### 5. Conclusions and Recommendations

#### 5.1 Conclusions

- Some food waste causes identified in wedding ceremonies/social gatherings were late serving often slipping into early next morning, inappropriate food serving combinations, unawareness of guest about food waste, guest's perception about food shortage, and congested food corners/high tables, and guests/hosts involvement in food waste.
- The food waste in marriages amounted to 282,150 tons in 2014. If this quantum of food waste is saved as clean food, it will offset hunger of 1.65 million, 0.96 million and 0.64 million people on 1, 2 and 3 meals per day basis respectively annually.
- In 2014, 495000 marriages were solemnized in Karachi comprising of 23.5 million people and 16 million youth. This constitutes solemnization of about 4 per cent marriages based on the total population and 6 percent marriages based on 16 million youth.
- According to our estimate Karachi has about 5000 Wedding Halls out of which only about a quarter were registered. This number does not include marriages organized by pitching tents in houses/ streets or vacant plots etc.
- The study found that females exhibit conscientiousness in the food intake and gather and waste less food than male.

## 5.2 Recommendations

- Since the present cultural norms of food waste has taken hundreds of years to become part of our cultural heritage, it will require paradigm shift in our understanding and approach at individual and collective level to behave responsibly while eating food. The recipe for such a change has been proposed in action plan (Table 7).
- It is believed that as a Muslim if we are reminded of our obligations at eating during wedding ceremonies then we as a part of Muslim society will conscientiously be able to save food for 76 million people in Pakistan who sleep hungry.
- It is proposed that the action plan, the polite message and poster message be translated in all local languages for better understanding and should be widely disseminated in all marriage ceremonies to bring paradigm shift in our eating habits and saving food for the hungry.
- The Islamic Development Bank (IDB) and Organization of Islamic Countries (OIC) should use their good offices to develop Food Waste during marriage ceremonies collection, distribution, monetization, and its Management Program to tap this valuable asset to offset hunger amongst Muslims and non-Muslims living under below poverty levels.

## 5.3 Food-For-Thought

A paradigm shift in behavioral change is required for saving food waste in marriage ceremonies and social gatherings by limiting oneself in collecting food in serving plates strictly in eatable portions instead of overwhelming quantities. Such a paradigm shift in individualized food collection behavior will result in saving food to offset hunger of those fellow humans who sleep hungry.

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