

## Religious Values of Chefs in Bali and Food Waste Awareness: A Preliminary Study

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### Abstract

This study examines the perspectives of chefs in Bali on the influence of religion on their attitudes towards food waste management. This research is the initial research of a project called Environmental habitus of chefs and food waste minimization in restaurant kitchens. Environmental habitus of chefs and food waste minimization in restaurant kitchens itself has two main categories to study, namely Past and Current Period. This study focuses on Past event, which in this case is religious value as one of the other factors such as at home education, out of home education and on the job training. The sample studied was five chefs, and analyzed using a qualitative method approach. The result of this preliminary study is religious value to a greater or lesser extent affect the view of the chefs on their habit regarding to food waste management in kitchen's restaurant.

**Keywords:** food waste; religious values; hospitality; Bali.

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## INTRODUCTION

### Background

High levels of food waste can be observed in hotels, overproduction of food, traditional catering methods that use a high proportion of unprocessed foods, and offering extensive menus to customers are all factors that can contribute to high levels of food waste, and all three of these factors have the potential to contribute to high levels of food waste. For instance, due to the high price of the meal, customers of fine dining establishments have extremely high expectations for the taste as well as the presentation of the food that they receive. As a result, these restaurants may generate an excessive amount of waste while the food is being prepared because of these expectations (Charlebois et al., 2015).

Previous research has shown that restaurants waste substantial quantities of food in their kitchen. Most of the studies focus on the post kitchen stage. For example, customers will not finish their meals because of their preferences or because they think the portions are too large (Li et al., 2020). The social component of dining out can also contribute to the excessive amounts of food waste that occur during this period. For example, the desire to socialize with and care for guests can lead to the incomplete consumption of food on the plate (Filimonau et al., 2020).

To the best of our knowledge, our research represents one of the first explorations into the relationship between religion and food waste from a chef perspective. There is relatively little empirical research exploring the relationship between these

two, particularly in perspective of chefs at the restaurant kitchen. We focus specifically on the examination of religious values given that religion serve as ones of the deeper, more impactful core value systems that a chef can have on food waste management in the restaurant kitchen.

**LITERATURE REVIEW**

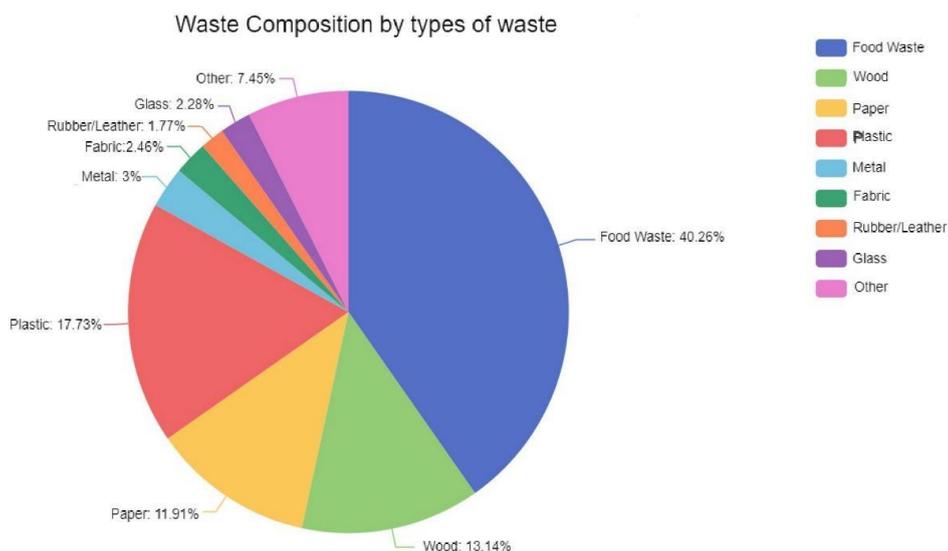
**Food Waste in Developing Countries**

A lack of infrastructure is to blame for food waste in developing countries, while a culture of abundance and apathy is mostly to blame for food waste in industrialized countries. Lack of infrastructures can be seen in poorly maintained road in developing countries and lack of processing facilities which can be found that food processing using hand-done instead of machines or advanced technologies. Thus, in the absence of enough manpower, the process becomes slow, the crops are vulnerable to pests that lower their quality and quantity, and they are occasionally destroyed or left in the field. As Gunders (2012) suggested that, in many

circumstances, growers prefer not to collect or harvest crops to avoid incurring further expense. However, once the food reaches the market, very little of it is wasted since it is viewed as too valuable. This is counter to what happens in developed countries, when food is significantly underpriced. In developing countries, consumption losses are minimal. 5.68% of postharvest food was wasted; 7.16 in processing and packaging; 6.39 in distribution. All developing countries waste \$310 billion in food. This is shocking because food waste strains production variables including energy and money, as well as land and water. (Aamir et al., 2018)

**Food Waste in Indonesia**

Based on Indonesia’s National Development Planning Agency (Bappenas) study in 2021, the potential for waste generated from food that is wasted before being processed (food loss) and food waste in Indonesia in 2000-2019 reaches 23-48 million tons per year or equivalent to 115-184 kg per capita per year (Wisanggeni et al., 2022).



**Figure 1.** Waste Composition by types of waste in Indonesia  
Source: SIPSN (2022)

According to the Economist Intelligence Unit and the Barilla Center of Foods and Nutrition, Indonesia is the world's second highest contributor to food loss and waste, with each citizen in the country losing or wasting an average of 300 kilos of food each year. Jakarta, Indonesia's capital, is expected to generate approximately 4,050 tons of food waste every day. This statistic represents approximately 54% of the total waste generated in the country on a daily basis. Surprisingly, even though some of us waste a substantial amount of food, 19.4 million other Indonesians are unable to meet their nutritional needs. (Jakarta 2019).

Without recognizing it, the issue of leftover food has become very serious in Indonesia. According to the United Nations Food Agency's (FAO) Head of Representative, Mark Smulde, Indonesia contributed around 13 million tons of food waste - food loss and food waste - of the nearly 1.3 trillion tons of food that was lost or squandered (Idris, 2016).

Every week, Indonesians throw away approximately 10 million pieces of bread, cake, and cookies, resulting in 292 000 tons of CO<sub>2</sub> equivalent emissions each year in the country of Indonesia. Because of a lack of resources and infrastructure, most developing countries rely on antiquated technologies such as anaerobic digestion (AD) to manage their food wastes. Because bread waste is a biologically formed organic waste, it poses a serious threat to human health and the environment, and it has the potential to cause pollution of natural ecosystems. Understanding the process of waste formation and comprehensive techniques of dealing with these wastes at various points in the supply chain, either by reducing wastage or by recycling rubbish into valuable items, may make it feasible to strengthen the economy (Susilo et al., 2021).

Based on the study conducted by Lemmy et al. (2021), it can be stated that a

significant number of members of Generation Z in the Tangerang area of Indonesia are already aware of the problem of food waste. However, this does not rule out the possibility of more issues requiring attention in the future. A greater knowledge of the ongoing food waste problem is required, as evidenced by the fact that there were 84 more respondents who were not aware of the ongoing food waste problem, representing a 45.90 percent awareness rate.

Furthermore, a study by Susilo et al. (2021) found that among the challenges facing food waste management efforts among the Indonesian people is that information about food in the media has not been widely disseminated by the public, owing to the fact that people do not understand much of the information provided by the media on food waste management and handling. In order to collect perceptions regarding the end process of food, it was necessary to conduct a survey to determine whether or not the research sample understood the process of recycling food into pet food when it becomes garbage. The sample in this study was dominated by people who were aware that food waste ended up in landfills rather than being recycled. This is consistent with previous researches.

Following an overview of the food waste problem in Indonesia, we will now turn our attention to the food service industry, which is responsible for a substantial amount of the food losses that occur along the food value chain.

### **Food Waste in Restaurant**

Although the threat posed by FW in global foodservices is widely known, there are no clear estimates of its prevalence. The literature does not provide aggregate global figures, but rather relies on regional evaluations to demonstrate the size of FW on a global scale (Filimonau, 2021). For example, when discussing the proportion

of food wasted in the worldwide food service sector, WRAP (2020) and FUSIONS (2016) statistics are frequently mentioned. These estimates indicate that the food sector in the United Kingdom and the EU-28 countries produces approximately 1.1 and 11 Mt of FW every year, respectively. This translates to 12% of the total FW generated by the country/food region's supply chain. If this figure is extrapolated from the worldwide food waste of 1.3 billion tonnes (FAO 2019), the global foodservice sector may squander more than 150 million tons of food yearly.

This extrapolated value is almost certainly an underestimate (Filimonau and de Coteau 2019). Increasing research from developed, but especially developing, countries indicates that substantially more food is wasted in their national foodservices. For instance, ReFED (2018) reports a 16 Mt annual number for FW in the US foodservice sector, which equals to more than 40% of the nation's total waste. In China, FW use in foodservices can reach up to 40 Mt per year, or 50% of the country's total (Wen et al., 2015). There is a need for more accurate evaluations of FW in different nations' national foodservice sectors in order to obtain a (more) realistic global estimate and establish a baseline for prevention and mitigation (Filimonau et al., 2019a).

The drivers of FW in foodservices can be classified according to the operating areas affected by wastage. Food is thrown out during the pre-, in-, and post-kitchen stages of foodservice provision (Papargyropoulou et al., 2019). Around 21% of FW is consumed in the pre-kitchen stage (WRAP, 2017). This wastage is a result of factors such as food damage during delivery and food deterioration on-site. Spoilage is a significant contributor to FW throughout this stage, which is influenced by both human and non-human influences (Christ and Burritt, 2017). The human aspect is represented by employees who have a

limited awareness of proper food storage techniques. This includes, but is not limited to, insufficient staff familiarity with the First-In-First-Out (FIFO) method to food utilization (Charlebois et al., 2015). The non-human factor is linked to equipment breakdowns, such as a chilling unit going out of service (Filimonau and Sulyok, 2021).

The kitchen stage creates 45% of FW, and the human factor is directly responsible for its occurrence (WRAP, 2017). Food is wasted in large quantities as a result of insufficient demand forecasts influenced by seasonality (Hennchen, 2019). While certain patterns of demand can be identified within a business community, forecasting them remains difficult (Filimonau et al., 2020b). Inaccuracies in demand forecasting result in food being produced in excess or materials being underutilized. The human aspect is also connected to the culinary staff's competencies. Inadequate cooking and plating abilities result in food orders being refused by clients, while insufficient trimming results in food orders being rejected. Skill damage food and prompt its wastage (Heikkila et al., 2016).

The post-kitchen stage accounts for 34% of FW, with wastage being primarily caused by the human aspect (WRAP, 2017). Customers abandon meals due to personal preference or when amounts are deemed excessive (Li et al., 2020). The social aspect of eating out can also contribute to FW in this period. For instance, the desire to socialize with and look after guests can result in unfinished plates (Filimonau et al., 2020). In their study of food value losses in Switzerland, Beretta, Stoessel, Baier, and Hellweg (2013) identify the food service industry as the third greatest source of food waste based on food input at each level of the value-added chain. Total losses are expected to be 18% of food inputs, with avoidable losses accounting for 13.5%. Overproduction of food, traditional catering methods that use a high

proportion of unprocessed foods, and offering extensive menus to customers are all factors that can contribute to high levels of food waste, according to the findings of their study, which indicate that high levels of food waste can be observed in hotels.

For instance, because the food provided in fine dining establishments is expected to meet extremely high standards of both flavor and presentation due to the high cost of the meal, these restaurants may produce an excessive amount of waste during the cooking process (Charlebois et al., 2015). Bharucha (2018) has evaluated the overall operating effectiveness of the system, researched the quantity of food lost in Mumbai's eateries, and offered suggestions for reducing food waste. To properly dispose of food scraps, Mumbai's restaurants have recognized the need to implement a scientific approach. Stronger steps are needed to guarantee that proper waste management techniques are followed in the restaurant industry, but the real solution resides in raising awareness about these issues. It would be impossible to maintain progress with informal and irregular efforts (Bharucha, 2018).

### **Food Waste and Religion**

Food is heavily integrated into religious traditions, both in terms of supportive social events and messaging related to restricting food intake (e.g., with fasting or avoiding certain foods). It has been proven that religious customers are more charitable and concerned than nonreligious consumers, making the connection between religion and food waste one of the more interesting ones (Midlarsky, Mullin, and Barkin, 2012). Minton et al. (2020) say that due to moral instructions in religious texts to care for God's creation and to treat every living human or animal with the same amount of love and care as oneself, religious people exhibit higher levels of sustainability concern than less religious or non-religious consumers. That above

statement in accordance with a study from Qian et al. (2022) where they found that religious rural households waste less food than counterparts in rural China. This contrasts with consumers who are less religious or who are not religious at all (Leary, Minton, and Mittelstaedt, 2016). According to the findings of some studies (Minton, Kahle, and Kim, 2015; Brandt and Reyna, 2011), religious people tend to be less concerned about environmental issues than nonreligious people. This may be because they view religious texts as encouraging dominion behaviors, such as ruling over the Earth and the animals that live on it, or because they have other concerns in life that take precedence (Minton et al., 2020).

The Hindu religion posits that divinity is present in food, and, therefore, the act of discarding it is considered impious (Schmidt et al., 2014). Despite this, food waste reduction initiatives may be limited by food safety regulations, similar to those practiced in monotheistic religions. For instance, the Bhagavad Gita advises against consuming food that has been prepared for more than three hours, owing to its potential lack of freshness and safety. Subsequently, after three hours, food loses its Satvic properties and some Hindus may opt to abstain from consuming it until the following day (Ganguly, 2017).

Buddha's teachings prohibit wasteful disposal of food as it reflects the interdependence of all phenomena and our own well-being (Daniels, 2010). Buddhists are naturally concerned about food waste due to this emphasis on interdependence (Mick, 2017). Food waste goes against Buddhist principles that encourage using food to benefit others (Minton et al., 2020). People who conceive of God as nature or the cosmos are more likely to support environmental protection initiatives than those with human-like conceptions of God (Johnson et al., 2017). A viewpoint not dissimilar to this one is emphasized in the Koran, which, according to one passage taken

from an English translation of the book, says, "O Children of Adam! At all times and in all places of worship, adorn yourself with lovely garments; eat and drink, but do not waste by going to extremes, because Allah does not appreciate those who do so." (Bloom 2010).

## METHODS

Qualitative research allows for a more in-depth understanding of the topic being studied by allowing for increased participant interaction. Interviews, as a method of qualitative research, enhance connection by allowing study participants to express themselves freely (Silverman 2013). Interviews enable researchers to follow up on and delve deeper into expressed viewpoints (Veal 2017). Qualitative research is a frequently used method for collecting and analyzing primary data in studies on food waste and its management in foodservices (see, for example, Vizzoto et al., 2020). A non-probability/purposive sampling technique is most frequently applied in case studies (Burns 2000). A specific case is chosen because it facilitates fulfilling the purpose and achieving the objectives of the research and aims at discovering, obtaining insights, and understanding the selected phenomenon (ibid). In other words, researchers sample because they need to interview people directly related to the research questions (Bryman, 2008).

Many qualitative advocates, including Patton (2002), Flick (2009), Hennink et al. (2011) and Silverman (2011), have supported the use of electronic software in analysis of qualitative data. Computer-assisted qualitative analysis software, NVivo 12, is going to use and utilize to organize and store data and aid data analysis within this research. However, it is important to note that using qualitative data analysis software is not a substitute for the task of data analysis, rather the software is a

device that helps the process. In this research, the implementation of NVivo 12 led to the data analysis being finished in a more appropriate way, as well as presenting better transparency to the analysis phase by recording each phase of data analysis. Moreover, the software allowed for computerization of the physical tasks of cutting, pasting, segmenting, photocopying, and collecting the number of interview transcriptions.

Therefore, more time is available to connect and develop ideas and theory to address the research objectives. In line with Bazeley and Jackson (2013), the objective of this qualitative analysis is not merely to discover concepts and categories in order to describe the study but to deliver a root and branch review of the data, including assessment of patterns, identifying connections between concepts and categories and detailed explorative analysis of participants. Data were generated through several in-depth semi-structured interviews with chef restaurants. For the purpose of this study, full-service restaurants are characterized as restaurants that operate with a full menu selection option and have seating for patrons. It does not include businesses like fast food restaurants, portable food kiosks, and cafeterias at work.

**Table 1.** Research Informants

No	Name	Position	Work-place	Duration of Interview
1	I Nyoman S	Executive Chef	5 Star Hotel	48 minutes
2	Komang A.W.	Chef	5 Star Hotel	1 hour 56 minutes
3	Yudha	Sous Chef	5 Star Hotel	1 hour 1 Minute
4	Suma	Executive Chef	2 Star Restaurant	36 Minutes
5	Angel	Executive Chef/Owner	1 Star Restaurant	29 Minutes

## RESULTS AND DISCUSSIONS

Regarding the relationship between religion and food waste management, the researchers found that religion influences chefs' views on food waste management. This can be seen from the following quote

*“Well, if there is religion, Balinese Hinduism, especially the story of Dewi Sri, if you are given a meal, it must be eaten and finished, don't throw it away. Then if you eat, even if a lot, please eat it up”* (Chef I Nyoman S).

According to pantheistic ideology, many Hindus believe that God can be found anywhere and in anything, including their food (Schmidt et al., 2014). Given this, throwing food waste is practically the same as showing contempt for God. The God can be found anywhere and in anything is reflected on the following quote:

*“If I often tell other people that *tat twam asi* is what we use the most in our daily lives; I am you, you are me. So, if you could throw away food, then you would treat that person the same way as well. So, if I don't appreciate the food, then the food won't appreciate you. This means that, in quotes, one day we will be short of food because so far, we have not appreciated food. Then one day the food also doesn't respect you, the view may later be *tat twam asi* too.*

According to Minton et al. (2020), moral instructions in religious texts to care for God's creation and to treat every living human or animal with the same amount of love and care as oneself leads to higher levels of sustainability concern among religious people than among less religious or non-religious consumers. Similar opinion is obtained about Dewi Sri, however does not specifically point to religion as an influence in the view of food waste management.

*“It is not specific to religion, it's never really. The most important is we have to be grateful for having food, before we eat we thank and pray. My parents said: it's not allowed to throw away the food. In terms of religion, Rice was also said to not waste rice because it was Dewi Sri”* (Chef Yudha).

Dewi Sri is the Indonesian equivalent of Lakshmi. Sri is the mother of the Javanese. She is honored as the Rice Mother and Rice Bride in Javanese harvest rites. Even in semi-Islamized places, she is revered as a benefactor who protects the people from famine. Sri brings monsoon rain and gives advice in dreams. She is the only Balinese deity not rooted in Indian Hinduism. She's Wisnu's consort. Dewi Sri inspired Bali's highly productive cooperative rice growing approach and is the island's master landscaper. Farmers pray to her for a rich harvest because she protects and nurtures rice paddies. However, there are very different opinions about the influence of religion on food waste management, as it can be read from below quote:

*“I personally see a lot of waste that occurs with these ceremonies (Hindu's ceremony). Because we can't use it fully. Imagine, of all the offerings, those that are used in offering are materials that can turn into waste easily. People use dry rice in offering because it is cheap, thus it's been a waste because I don't understand how it can be eaten? (dry rice). It is not possible to consume it. But like Tumpeng rice, tape, fruits, all of that is just thrown away as garbage, it can't be processed anymore”* (Chef Suma).

In addition to examining the perceptions of chefs who are Hindu, this study also examines chefs who are Muslim and their perspective on food waste management.

“Food Waste in Islam is not allowed but it is not a sin, Muslims say it is mubazir (redundant). That would be waste. we shouldn't throw it away. There is a name for that term call makruh, if you do it it's not a sin but if it is possible, don't do it. If you are able to resist it's better but if you are not and you, do it, it's not a sin”.

## CONCLUSIONS

This preliminary research was conducted to understand the environmental habitus of chefs. James (1914) and Skinner (1965) argue that Habits are formed in 3 stages: (1) Context cue = A trigger of habit which can be embedded in the PAST and facilitated by the CURRENT events and circumstances; (2) Behavioral repetition = Habitual routine; and (3) Reward (either psychological or material). Here, the researcher conducted a preliminary study that only focused on the PAST section, namely the Chef's religion and its influence on their attitude towards food waste management. In our conceptual model, religious values are a thing of the past along with at home and out home education as well as on the job training to form the so-called context cues that underlie how chefs will take an attitude towards food waste management today.

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